

S. O.

## Government of His Highness the Maharaja of Mysore.

GENERAL AND REVENUE DEPARTMENTS.

G. O. No. I. C. 5270-5330—A. & E. 122-25-6, dated 29th January 1926.

### Administration Report of the Agricultural Department.

Reviews the — for the year 1924-25.

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Administration Report (Part I) of the Agricultural Department for the year 1924-25, received with letter dated 16th September 1925, from the Director of Agriculture.

2. Part II of the above Report received with letter No. P. 27 of 25-26, dated, 4th December 1925, from the Director of Agriculture.

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Recorded with the observation that there has been inordinate delay in the submission of Part II of the Report and that, in future, both parts of the Report should be submitted together invariably before the due date.

2. *Personnel.*—Dr. Coleman continued to be in charge of the Department during the year, except for about two weeks in the early part of January, when Mr. H. V. Krishnayya was in charge of the Director's duties.

3. *Seasonal Conditions.*—The year, was, on the whole, favourable for agricultural operations. Owing to very heavy rainfall on the Western Ghats, there were unusually high floods in the rivers, causing considerable damage to early sowings, especially in the channel tracts of the Mysore District and in the Malnad areas of the Western Division. Seeds of short duration were supplied to the sufferers at concession rates; this afforded a great measure of relief, particularly as the late rains happened to be generally favourable.

4. i. *Scientific Sections—Chemical Section.*—Manurial experiments on areca, paddy and sugar-cane crops and feeding experiments with milch cattle, gave valuable results in some cases. It does not appear that the investigation of sandal spike disease has yet yielded any substantial results, other than those reported last year. Government consider that too much emphasis cannot be laid on the importance of this investigation in the interests of the sandal revenue of the State.

ii. *Mycological Section.*—Spraying work against "Koleroga" of areca was extended over an area of 5,503 acres as against 2,726 acres in the previous year. The disease is reported to have broken out in new areas in the Kadur District. Necessary steps should be taken by the Department to effectively prevent the further spread of the disease.

Preliminary work on the Coffee Experimental Farm was carried out during the year. The Mysore Coffee Cess Bill has been since passed into Law and Rules under the Regulation have also issued for regulating the collection and administration of the Cess realisations. Sanction has been accorded to the opening of the Coffee Experimental Station at Guntenaik Estate near Balehonnur. Government hope that as the result of this Experimental Station and of the scientific investigation of coffee diseases and analogous pests on Coffee Estates there will be a considerable development in this important industry in the near future.

iii. *Entomological Section.*—The campaign against the *Kamblihula* pest was continued in the Kolar District. Much useful work was done in investigating the lime tree borer, orange borer and various other insect pests.

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iv. *Botanical Section*.—Experiments were continued with fair success, on different varieties of ragi, cotton, groundnut and castor, but it is observed that the Department has not been devoting sufficient attention to paddy-breeding work. The Director is requested to take suitable action in this matter in the current year.

It will be interesting and useful if the Director could investigate the question whether the soil under channels is being impoverished to a greater extent than under tanks.

v. *Agricultural Engineering Section*.—The "Mysore Plough" is reported to be maintaining its popularity with the agriculturists. The selling price of the plough was reduced to Rs. 25. Government are of opinion that a great deal still remains to be done in popularising the use of improved implements in all parts of the State. The question of arranging for the manufacture of improved agricultural implements in the Central Industrial Workshop requires to be settled early.

vi. *Well Boring Section*.—This section, originally sanctioned for one year (1924-25) was continued for another year till the end of June 1926. Much work could not be carried out by this section, as it was organised late in the year. Orders have since issued transferring this section to the control of the Department of Industries and Commerce.

5. *Experimental Farms*.—Adverse seasonal conditions and other causes are reported to have affected the proper working of the several farms. These farms require close and vigilant supervision, in order to reduce the cost on experimental work to the extent that is absolutely essential so that the net expenditure to Government on the maintenance of these farms may not be excessive.

In spite of the instructions issued in Government Order No. I. C. 5611-70 — A. E. 65-23-11, dated 22nd March 1924, full information regarding the financial working of the farms with reasons for excess expenditure over receipts has not been furnished in the report in respect of any of the farms, except the one at Nagenahalli. The Hebbal Farm suffered to some extent from inadequate water supply. Experiments were conducted in respect of new breeds of ragi there. In the Babbur Farm experiments were carried on with different varieties of sugar-cane, plantains and cotton. The receipts from the cotton gins on the farm have fallen unduly low during the year being Rs. 1,063 as against Rs. 2,135 in the previous year. There was a slight increase in the rate of the cost of manufacture of jaggery on the farm. Wet crops—paddy and sugar-cane—on the Marthur Farm suffered severely from the floods; the dry crops, however, fared well. Breeding experiments on ragi and on some varieties of paddy and sugar-cane were continued on the Nagenahalli Farm. The receipts and expenditure of the farm amounted respectively to Rs. 5,050 and Rs. 6,422 during the year. The farm was started with the objects of conducting experimental and demonstration work in respect of sugar-cane cultivation and of supplying sugar-cane setts to the raiyats when the Cauvery valley should come largely under sugar-cane cultivation. The Director reports that the irrigation facilities on the farm are not adequate and that the area is neither suited nor sufficient for such purposes. Government await his separate report on the continuance of this farm.

6. *General Demonstration Works*.—This work consisted as usual, in the introduction of improved seeds, farm implements and commercial and other manures and in the demonstration of better methods of cultivation of individual crops on private holdings.

Government note with appreciation the increasing interest taken by the Co-operative Societies in the matter of popularising the use of improved implements and seeds.

7. *Central Implement Depot*.—Implements to the value of Rs. 53,045 were issued from the Central Implement Depot to the several Branch Depots as well as to private individuals and a sum of Rs. 65,222 was collected during the year leaving a sum of Rs. 21,441 as the arrears outstanding at the end of June 1925. The value of implements issued, the collections made and the arrears outstanding for the year 1923-24 were respectively Rs. 47,666, Rs. 49,655 and Rs. 26,558. While this indicates a fair progress in the business turned out by the Depot, it must be observed that the outstandings are still disproportionately heavy. The Director is requested to make a special report, before the end of March 1926, showing the details of outstanding arrears and explaining the reasons for their non-recovery. Government desire to observe, in this connection, that there is at present, a certain amount of confusion in maintaining the accounts in the Central Depot and in the several Branch Depots. The question of suitably revising the accounts procedure is separately under consideration.

8. *Agricultural Education*.—The Agricultural School at Hebbal and the Sri Krishnarajendra Vyavasaya Dharma Pathasala at Chikkanahalli, Sira Taluk, continued to work satisfactorily during the year.

9. *Live Stock Section*.—Breeding work was continued on the Rayankere Palace Dairy Farm and on the two Sheep Farms at Hebbal and Yellachihalli. The outbreak of foot and mouth disease seriously affected the work on the Rayankere Farm. There

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was a large number of deaths among baby calves due to "White Scour". The daily average milk production, however, rose to 5·9 lbs., from 5·4 lbs., and 4·1 lbs. in 1923-24 and 1922-23. Two pure Holstein heifers imported from abroad died during the year. The total number of births was 76, of which, 70 were Holstein crosses, one pure Holstein and 5 pure Scindies

The rate of mortality was rather high among Merino rams and ewes and cross-bred stock, during the year, at the two Sheep Farms. The Director is requested to submit a special report detailing the reasons for this heavy death rate. In view of the fact that the Merino rams and ewes are being imported from abroad, at considerable cost, it requires investigation as to whether the cost incurred on importing and maintaining them is commensurate with the results achieved so far.

The Kolar Sheep Breeders' Association continued to do good work during the year.

10. *Financial.*—Information given under this head in the Departmental Report is very meagre. Government are constrained to observe that the financial side of the Department has not been receiving sufficient attention by the Departmental Officers. No mention has been made in the report, of the large amounts of advances outstanding against the Department, for the past several years, or the attempts, if any, that are being made towards their early adjustment. The outstandings especially under Oil Cake Advances are very heavy and are pending for a long time. The Director is requested to take prompt action in the matter and submit a special report to Government by the end of the current year. In future reports of the working of the Department, full and clear information should invariably be furnished on the financial results of the working of the Department as a whole, as also of the several experimental farms. It should also be stated how the distribution of seeds and manures, sprayers and chemicals and implements, by the Department has worked, from the financial standpoint, during the particular year under review.

11. *General.*—Government note that the work of the Department during the year was satisfactory, under the direction of Dr. Coleman.

R. RANGA RAO,  
*Secretary to Government,  
Agricultural and other Departments.*

To—The Director of Agriculture in Mysore.  
The Comptroller to Government.  
The other Heads of Departments.  
The Deputy Commissioners of Districts.

PRESS TABLE.

Exd.—P. S. R. N.

ANNUAL REPORT OF THE DEPARTMENT OF AGRICULTURE,  
MYSORE STATE, FOR THE YEAR ENDING 30TH JUNE 1925.

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PART I.

Dr. Leslie C. Coleman was in charge of the Department of Agriculture and the associated departments throughout the year except from January 2, 1925 to January 14, 1925, when he was on privilege leave. Mr. H. V. Krishnayya was in charge of the office of the Director of Agriculture during this short period. Mr. H. V. Visvesvarayya was appointed Well-Boring Engineer in Government Order No. I. C. 5279-81—A. & E. 132-23-18, dated 30th January 1925 and entered upon his duties on 6th February 1925. There were no other important changes in the staff during the year.

Information regarding the leave availed of by the officers of the Department and touring done by them will as usual be found in Part II of this Report.

*Seasonal Conditions.*—The year on the whole was favourable for agricultural operations. The early rains were very satisfactory throughout the maidan tracts with the exception of a few taluks in Tumkur and Kolar Districts, and normal crops were harvested. The Fodder Distress relief operations in force were closed early in the year, though a certain amount of work in the Revenue Department had to continue in connection with seed supply on credit rendered possible by the prompt sanction of Takkavi loans, to fully ease the situation created by the famine of last year.

In the channel tracts of Mysore and Malnad areas of the Western Division, floods caused very serious damage to crops. Some relief was afforded by supplying seeds of short duration paddy and other short season crops, and the late rains being generally favourable, these late crops gave medium to good outturn.

*Chemical Section.*—Manurial experiments have been continued on the important crops of the State and valuable results obtained, which will enable us to greatly extend work in the fields.

Field experiments on areca have shown that phosphatic manures hitherto used in the mixture are not needed, which means a good deal of saving per acre, and will help to popularise chemical manures.

Experiments on paddy have shown the proportions of sulphate of ammonia and superphosphate which are most profitable and that groundnut cake is equal to ammonium sulphate and may be used if the cost per unit of nitrogen is the same or less. Large field experiments were successfully carried on at Hampapur on a 25 acre plot, the cost being borne by the landlord himself, and this should serve as a most valuable demonstration.

An application of lime and phosphate to sugar-cane in addition to the usual nitrogenous manures proved very beneficial at the Marthur Farm plots. On the other hand, on lands under the Vanivilasasagar tracts lime proved unnecessary. These experiments will have to be carried out in other districts as conditions vary considerably and the presence or deficiency of lime is an important factor in the preparation of the various manure mixtures.

In the Pot Culture Section, trials on the manurial requirements of red soils have been continued and show that while all soils respond to nitrogenous manures, the phosphate and potash requirements are considerably influenced by the previous manurial history.

A good deal of work has been done in soil study especially on soil moisture determination.

In connection with sandal spike analyses of oils from different parts of the trees, both healthy and diseased, were continued. It is however difficult at present to draw any definite conclusion.

Feeding experiments with milch cattle have been continued at the Rayanakere Dairy Farm, and the results obtained till now are being worked up for publication.

*Mycological Section.*—*Work on Koleroga of the arecanut.*—This important work has been extended over a much larger area than in previous years, *i.e.*, 5,503 as against 2,726 acres of gardens. The total transaction in the sale of sprayers and spraying materials amounted to Rs. 27,000. It is estimated that some 16 lakhs of rupees is the value of the crop saved. There are however new outbreaks in several taluks and the question of preventive spraying is one that will have to receive serious attention this year.

Black Rot in Coffee has received close attention. In addition to the area sprayed by the Department, in all about 8,000 bushes, material and sprayers for spraying 35 acres have been sold to Planters.

The investigation of other diseases such as Die Back in Coffee, Smut on Ragi, Betelvine mildew, etc., has been continued both in the laboratory and the fields. Further work is necessary before definite results can be published.

*Coffee Experimental Station.*—Preliminary work has been done in this connection. The area of 17 acres of growing coffee placed at the disposal of the Department has been worked up to obtain correct figures of yield. Three harvests have thus been tabulated row by row.

A plan for manurial experiments has been laid down. Seeds from known heavy bearers have been collected from estates both in Mysore and Coorg and some 3,000 plants are ready in the nurseries for planting in the new area.

A part of the jungle has been cleared and temporary sheds erected for labour, out of funds (Rs. 2,000) generously placed at our disposal by the United Planters' Association, Southern India, for the purpose, and further final lay out of the whole area of about 200 acres is now being worked up.

*Entomological Section.*—The work on Kamblihula was continued in the Kolar District, the area covered being 43 villages or 12,000 acres.

The number of moths picked was 1,80,000 nearly, representing 80 million caterpillars. The raiyats collected a voluntary contribution of Rs. 800 from which extra fieldmen and school children are employed for the picking. Eminently satisfactory though this is both from the point of the amount of work done by the Department and the contributing raiyats' recognition of its importance, the effect is still local and the raiyat does not actively take up the work himself.

In the parts where the Department has succeeded in practically stamping out the pest, the raiyat easily persuades himself that nothing further is necessary. In sections where the plants, through earlier sowing, have reached a greater degree of hardness at the time the moths emerge, the caterpillar cannot do much damage, but generally migrates to younger fields. In these sections the raiyat is ready to argue that this work is not necessary and is a mere *tamasha*. It is only in the areas where the seedlings are in an early stage of growth and the crops are literally wiped out that the raiyat actually comes forward and prays that next year all his fields may be picked. This clearly shows that a much wider activity, both educative and active, is necessary. It is physically impossible for the scientific staff to cover the vast area of the State at one time and the only logical solution is to develop the lower service, *i.e.*, Inspectors and Fieldmen, so that they may be able to take over much work after it has passed the experimental and research stage and the scientific staff have laid down definite remedial measures.

Good progress has been made in the investigation of the Lime tree and Orange Borers and remedial measures demonstrated. It is hoped that the results gained in the work in the Gardens Department may be usefully co-opted during the coming year. This pest was investigated in Coorg at the request of the authorities and a report on the lines to be adopted for its eradication is now before the Coorg Government.

The hand-picking of the coffee borers has been continued in two estates in Saklespur, but a good deal more work is required before definite results can be published.

Work on other pests, such as sugar-cane borer, mango hopper, avare pod borer and cardamom pest, has satisfactorily progressed.

*Botanical Section. -- Ragi-Breeding work.*—The breeding and testing of standard varieties of Hain ragi has been actively continued. Some 600 District collections have been classed under 14 divisions according to their heritable characters. From these are evolved pedigree varieties of which H. 22, one of the most promising varieties, has been largely distributed.

Experiments and selections continued with the object of evolving an earlier maturing variety of H. 22, as in several districts the type variety has proved not quite suitable owing to its late maturing character.

Of irrigated ragi, a number of varieties have been under experiment in the Farm and two early maturing and one late maturing varieties which proved very satisfactory are now being distributed.

Experiments with Kar Ragi were conducted in several taluks in the Mysore District on Government and private holdings and pure type selections are being made.

*Cotton.*—Breeding work of this most important staple crop has continued on the Babbur Farm and the variety 69 is being largely distributed. Cultivation of standard varieties has been very successful, but the market prices are rather low as compared with last year. Further work on the improvement of 69 is being done.

The cross with exotic cotton, *i.e.*, Mysore-American IV has been practically fixed and yield-test will be taken up this year.

*Groundnut.*—Work has been continued in obtaining a more prolific variety of the erect type, and of the eleven varieties so far grown on the Farm, about three have proved very satisfactory and have been largely distributed. Several varieties of outstanding merit are still under trial and promise well.

*Castor.*—Some 54 district collections have been purified, and of these 17 selections continued under tests. Three selections which proved most satisfactory were distributed among the Union members for further trials.

Of the other crops under experiment, some 200 seedlings of potatoes have been selected and put under trial for drought and disease-resisting characters.

Owing to failure of the rains, not much work could be done with paddy and sugar-cane.

*Agricultural Engineering Section.*—The most important work of this section lies in the popularisation of agricultural implements, and of these the Mysore plough again holds first place. After evolving this type, its manufacture in England was arranged for and during the year a further consignment of 400 ploughs was received, and as a consequence of the large order, the price was reduced to Rs. 25. Nevertheless, the further reduction of the price is of extreme importance and continued efforts were made to effect this by arranging for local manufacture both at the Bhadravati Iron Works and the Central Industrial Workshop. Several implements turned out by these are now under trial at the Farms. It is hoped that a specially hard casting made in the workshops will prove of greater resistance in the wear of the shares and lower the cost of maintenance.

Trials with seed-drills, sugar mills and jaggery-boiling plants have been continued, efficiency and cost being carefully recorded. The Kirloskar mill and Babbur multiple furnace have so far given the best results in these respective trials, but it requires further work under field conditions before making definite statements. Trials of several types of engines for irrigation on the Farms have been conducted.

Other Departmental plant such as Power Ensilage Cutter, Motor Lorry, Tractor, etc., have been satisfactorily worked and maintained by the section. The tractor was found too light for the soils at Chitaldrug.

*Well-Boring Section.*—This section though sanctioned in the beginning of the year as per Government Order No. 7679-742—A. & E. 132-23-7, dated 19th June 1924, could not start operations until the latter part. The Engineer in charge was appointed in February 1925 and most of the staff reported as late as April. The acquisition of additional boring plant took some time, some pumps were only received in May last and several implements are as yet undelivered.

At Maddagiri a number of wells have been blasted, one of them being for the Maddagiri Municipality, and technical advice has also been given to a number of private parties.

In addition to the other borings done during the last calendar year by the Boring Inspector, a tube well was undertaken for Messrs. Brahmappa Thavannappanavars' factory at Davangere. The bore has now been carried down to about 75 feet, nearly 50 feet of which is very hard rock. The well is now completed having about 30 feet of water, a  $1\frac{1}{4}$  pump not being able to unwater it though worked continuously. Fresh lining pipes and a new pump have to be installed for the party and the work closed.

During the year so far as existing staff and tools admitted 16 borings have been executed, blasting was done in 4 wells, and pumping outfits have been lent and help rendered to 6 persons in deepening wells.

*The Experimental Farms.*—Though seasonal conditions were in many cases abnormal, yet on the whole the work on the Farms has progressed satisfactorily and results have been enabling the Department to push improved crops production.

*Hebbal Farm.*—The experiments with those varieties of Ragi which have given conclusive results in previous years were discontinued and other varieties from the botanical area taken up. Cultural operations such as thinning, inter-culturing, etc., were somewhat dislocated by the failure of rain. The yield was nevertheless very good as compared with that obtained in the neighbouring fields.

Experiments to find out the correct depth for sowing were conducted and it was found that the shallow sowings (at  $\frac{1}{2}$  inch depth) gave the best result.

The experiments of previous years with ammonium sulphate had this year the object of finding out the correct time of application.

Paddy and sugar-cane experiments could not be brought to any definite conclusion, as want of rain interfered. All the seedling canes and standard varieties have however been kept up and demonstrations in milling and jaggery-making were held.

*Babbur Farm.*—The dry crops consisting chiefly of Bilijola and Sanhatti gave but a poor outturn. Hariali grass interfered greatly with the crops and could not be eradicated even with the heavier plough.

The toxic acids formed by this grass are inimical to all cultivation crops, and the problem of tractor-ploughing which has practically been abandoned, will require re-consideration in this connection.

In the wet area the experiments with the different varieties of sugar-cane yielded good results. H. M. 553, J. 33A and H. M. 602 produced the best yields. H. M. 544 came fourth, but on account of its superior milling qualities, it maintains its popularity as one of the best canes so far evolved. Forty-four thousand five hundred setts of this variety were distributed.

Manurial experiments on cane with ammonium phosphate were conducted and have shown better result than ammonium sulphate. This of course has to be repeated in field experiments. I have seen a large number of fields in most districts and the application of ammonium sulphate stands out everywhere as a prominent success.

The cotton experiments have been successfully continued, 15 acres of the area being under the Assistant Botanist for breeding work. Cotton 69 has been largely distributed, 78 maunds having been supplied against 57 maunds last year.

*Plantain.*—Experiments have confirmed that the Poovan variety is the best for this area and that as an interculture with cocoanuts they have diminished the attack of the Rhinoceros beetle. Experiments with mulberry growing and silk worm rearing continued and prove promising.

*Marthur Farm.*—The wet crops, chiefly sugar-cane, suffered seriously from floods and affected the total yield.

Experiments have however continued with varieties, tillering qualities, and manurial. The disadvantage of closer planting of non-tillering varieties has been shown, also that tillering cannot be forced by the use of heavy manuring.

The superiority of ammonium phosphate over ammonium sulphate has been continued. The dry crops were benefited by the later rains and very good results with ragi were obtained. M. N. 1 again proved the best and is valuable in as-much as it will stand both abnormal wet as also drought and still give a higher yield.

Of groundnuts, the short season varieties, Spanish and Japan, did well and were largely distributed. The Hebbal varieties were put under experiment on this Farm on a small scale.

Manurial experiments on groundnut were conducted and gave good results.

*Nagenhalli Farm.*—The failure of the irrigation arrangements continued to hamper the work on this Farm. The Krishnarajasagara dam has now reached the level at which this channel takes off, but meanwhile several breaches have occurred in the channel itself and unless these are repaired, the trouble may recur next hot season. Experiments were conducted with varieties of ragi on a field scale, but the large area was devoted to trial with paddy, and of them the two varieties imported from Coimbatore again proved the best yielders.

Experiment in spacing, green manuring and paddy-mixture trials yielded good results.

Sugar-cane work could not be done owing to want of water except that a small area was kept up to grow the principal varieties chiefly H. M. 544, 312—602 for distributing setts. Though this Farm was originally selected for experimental or demonstration work and for the supply of sugar-cane setts when the Cauvery valley area comes largely under cane cultivation, I consider it most unsuitable at least for the latter purpose. The area at all useable for cane amounts to a few acres only and facilities can never be adequate. The area is therefore not only unsuitable but is hopelessly inadequate. When the time for large demand comes, we shall have neither reliable data regarding suitable varieties nor the adequate quantity of setts that will be required annually. I shall submit this in a separate representation to Government.

*General Demonstration Work.*—This important work has continued as in previous years under the Deputy Director and the Assistant Director with a staff of Agricultural Inspectors and Fieldmen and consisted in the spread of new and proved varieties of crops, the introduction of improved farm implements, the introduction and trial of profitable commercial fertilisers, and better methods of cultivation and general advice.

This demonstration work is based on direct demonstration on the farmers' holding and is much more effective and beneficial than general demonstration on a special demonstration farm in the district ever would be, but it demands much greater action and efforts from the District officers and their staff and I may give some idea of the extent of this work when I say that in the Eastern Division alone over 500 farms have been visited.

The work further promotes, and is essentially based on, co-operation of the farmer himself. In this connection the work done by members of the Agricultural and Experimental Union and other influential individual raiyats deserves the highest recognition.

In the distribution of seeds, manures and implements, the great interest taken by the Registrar of Co-operative Societies has been a most valuable help and not only have the general rural co-operative societies expanded their work but special agricultural co-operative societies are now being formed.

The District Boards throughout the State have also enthusiastically assisted the Department by subventions, placing funds at our disposal for buying seeds and manures, by granting agricultural scholarships, assisting co-operative societies, etc., and lastly there is that great potential factor, the Village Panchayet. At Thippoor the Panchayet have started their own agricultural depot for sale of manures, seed and implements. There is no public or private agency which could more accurately gauge the requirements of the village than the Panchayet itself, and I hope that great strides will be made in the formation of Panchayets once the Bill now before the Legislative Council is passed.

*Distribution of Seed —Ragi.*—H. 22 which so far is the best suited and most prolific variety has continued to spread. The total distribution from our seed depots has been 294.85 pallas in the Eastern and 77.06 pallas in the Western Divisions. These quantities however give no idea of the actual spread, because the great amount of seed is supplied by raiyats direct, nor can the area under cultivation, as stated in the Divisional reports, be relied on.



The need for better organisation of the field staff, both for controlling the purity of the local seed-supply (raiya to raiya) as well as tabulating correct statistical figures, is a real one. One gratifying feature I noted from actual inspection is the fact that in some villages the old varieties have been practically eliminated and H. 22 only is grown. This will prevent any mixing of seed.

*Paddy*.—Seed of this crop was distributed largely. In the Western Section the bulk consisted of Hallubalu, *i.e.*, over 450 pallas. In the Eastern Section this variety was distributed in connection with the Flood Relief work, when 462·96 pallas were sold at concession rates.

The ordinary Departmental distribution complied chiefly the demand for short season paddy, especially Coimbatore No. 1. In the Eastern Division 66,190 seers in all were distributed.

*Cotton*.—The distribution of 69 has been extended to about 1,500 acres and strict survey kept over the fields for purity of strain. This has been separately ginned and seed sufficient for 10,000 acres for the current year stored.

M. A. IV, a promising new variety, has been given out for trial to selected clients.

*Sugar-cane*.—The area under this important crop has been extended and distribution of new varieties from the Departmental Farms has been well maintained, some 7 lakhs of setts having been supplied. In the case of H. M. 544 which is one of the best ones, the District Boards have helped to make possible a wider distribution of setts purchased from growers. Manorial demonstrations have shown good results, the raiyas are ready to have larger areas under this crop and it is hoped to enlist co-operative activities to assist in the distribution of setts from growers' fields at rates lower than they ordinarily demand.

*Groundnut*.—Of all the crops introduced and distributed, this has perhaps shown the greatest rapidity in expansion. The short season varieties have proved most successful as a catch crop, quite apart from the good they do in the improvement of the soil. There are in the Western Division alone sown 35,000 acres under this crop and in the Eastern Division it is likewise being largely taken up.

This work of seed distribution is unquestionably the most important function of our field staff. By it, more than in any other directions, we bring to the ryot the benefits to be derived from the scientific and experimental work of the Department. But it not only consists of the distribution of the seed grown on the departmental farms and stocked in the departmental depots; the greater expansion is obtained by the seed of proved varieties grown on the ryots' field and sold by them for seed purposes either through our Inspectors or to other ryots direct. But as this supply gets away further and further from the original source, elements such as impurity, deterioration and some possibility of fraud, creep in, and the better development and organisation of the field staff to enable them to exercise efficient control is very necessary.

*Popularization of Manure*.—The department distributed 45 tons of ammonium sulphate and some 80 tons of phosphatic manures besides 200 tons of oilcake. The greater quantities are however obtained by putting the ryots in direct touch with suppliers and it is known that large quantities have been imported direct. The ryots are gradually and increasingly realising the value of commercial fertilisers.

*Implements*.—The demonstrations of improved implements held come to 850 and the sales of implements especially ploughs have been very satisfactory, the latter alone amounting to 887. Efforts to manufacture the Mysore plough locally continue, and arrangements with the Kirloskar Company for sale of their ploughs through our depots have been satisfactorily concluded. Cultivators and Nahan Sugar-cane mills have also sold well.

*Measures connected with the Fodder Famine*.—Though part of the temporary staff sanctioned in this connection was continued till September 1924, its chief concern was the disposal of the balance of stocks in the Depot and adjustment of accounts and no work relating to the relief of distress proper was carried out after the period covered by the Administration Report of the Department for 1923-24. An account of the operations is contained on pages 10 to 12 of this Report and there is nothing particular to add to it. Detailed accounts regarding the financial side of the operations have been submitted with this office letter No. Roc. 973 A of 23-24, dated 8th May 1925.

*Agricultural Education.*—The Hebbal Agricultural School started the year with 36 students 6 of whom were scholarship-holders. Eight students sat for the Diploma Examination and four of them passed. The applications for admission were very great this year, but as the number taken is limited by the Hostel accommodation, only 18 new students could be accepted.

*Sri Krishnarajendra Vyavasaya Dharma Patasala, Chikkanhalli.*—In this school also the applications for admission were unusually large, the number being 52. The number on the rolls was 15, all of whom passed out successfully. The training includes practice and theory of all the main agricultural operations, live-stock, pests, etc., and I have been very satisfactorily impressed with the work of the Fieldmen who passed out of this School.

*Live-Stock Section.*—Breeding work at the Rayanakere Dairy Farm was seriously hampered by a severe outbreak of foot and mouth disease. The adult herd, nevertheless, remained at last year's strength, *i.e.*, 331, and milk production increased to 5.9 lbs. from 5.4 and 4.1 during previous years. This increase, in spite of the adverse conditions, is due partly to weeding out of poorer cows and partly to the coming into profit of a number of our young half-bred cows. The total number of births was 76 of which 70 were Holstein crosses, one a pure Holstein and 5 pure Scindies. Two pure pedigree Holstein heifers were imported, but unfortunately both died; one of them gave the above pure Holstein calf. The deaths are particularly unfortunate since the success of our breeding work, *i.e.*, getting pure half-breds, necessitate the maintaining of a nucleus of pure Holstein on the one hand and pure Scindies on the other, and now that we shall be able to see results from the previous breeding since most of the young Ayreshires, Holstein and other breeds come into profit, the loss of these Holstein cows will be greatly felt.

*Draught Cattle.*—The results of the distribution of breeding bulls have not been very conspicuous. With the organisation of the Amrut Mahal Department, it is however anticipated that better progress will be possible in the current year.

*Sheep-Breeding.*—Of the total strength of animals on the Hebbal Farm, *i.e.*, 340, 122 were transferred to other farms, 49 were sold and 40 died. At Yellachihalli Farm the death-rate was also fairly heavy and sheep suffered from parasite due to want of accommodation and quality of pasture. Pure Merino rams have to be imported to carry on breeding to supply the demand for half-bred rams to private breeders.

The Kolar Sheep Breeders' Association have done very good work in getting together good white flocks, but unless we can supply the half-bred Merino rams, systematic breeding will be difficult.

*Fodder Production.*—In the Rayanakere Dairy Farm an area of 200 acres has been worked for fodder and 1,400 tons of ensilage were made. Experiments with grasses have been conducted, but owing to drought no definite results could be noted except that Kikiyu grass showed a much better outturn than local grasses. One thousand five hundred lbs. of sunflower seed were collected and are ready for distribution during the current year.

In Tumkur several experiments by private owners in the production of ensilage have been continued and other raiyats in Kolar and Bangalore have taken up this work.

*Co-operation.*—It is gratifying to record the ready and enthusiastic co-operation that has been afforded by both individual farmers, as also the members of the Agricultural and Experimental Union, by District Boards, Co-operative Societies, Taluk Boards and all the Revenue Officials. Their services have been of immense help in the distribution of seed, manures and implements and in the expansion of the work of the Department in general.

The staff of the Department have all through worked with zeal and enthusiasm which deserves the highest recognition.

G. H. KRUMBIEGEL,  
Offg. Director of Agriculture.

**ADMINISTRATION REPORT OF THE AGRICULTURAL DEPARTMENT  
FOR THE YEAR 1924-25.**

**PART II.**

*Charge.*—Dr. Leslie C. Coleman continued to be in charge of the Department throughout the year except for a short period of 12 days from 2nd January 1925 to 14th January 1925 when he was on privilege leave, and Mr. H. V. Krishnayya was in charge of the current duties of the Director.

*Tours.*—Dr. Coleman was on tour for 85 days during the year.

*Meetings Attended.*—The subjoined statement shows details of the various Meetings attended by Dr. Coleman during the year:—

Name of body.	No. of meetings.
University Council	3
Legislative Council	3
Representative Assembly Dasara Session in October 1924, and Birthday Session in June 1925.	2

He also attended the meeting of the Select Committee to consider the Coffee Cess Bill on 6th February 1925, the Coffee Planters' Meeting at Chikmagalur in September 1924, the Provincial Co-operative Conference and the meeting of the Heads of Departments and Deputy Commissioners and the Hassan District Board Meeting and Meeting of the Economic Conference. He presided over the Tumkur District Conference, Kumsi Taluk Conference and the Agricultural Sections of the Shimoga, Chitaldrug and Kolar District Conferences and over the Agricultural and Sericultural Sections of the Mysore District Conference.

He also presided over the Annual Meeting of the Agricultural and Experimental Union held in November 1924.

*Inspections.*—The following are the various institutions and places inspected by the Director during the year:—

Farms	Depots	Veterinary Dispensaries and Hospitals
Babbur	Chintamani	
Marthur	Koleroga Depot at Kallurkatte.	Kolar Veterinary Hospital.
Nagenhalli	Kolar (Agricultural Depot.)	Veterinary Dispensary at Mudgere.
Rayanakere Dairy Farm	Chikmagalur Implement Depot.	Veterinary Hospital at Saklespur.
Yellachihalli Sheep Farm	Hassan Depot	Veterinary Hospital, Shimoga.
The Coffee Farm at Guntanaik		
Sericultural Farm at Sidlaghatta		
Silk Filature at Mysore		
Sericultural Farm, Kolar		
Channapatna Silk Farm		
Sisal hemp plots at Saklespur		

*Leave.*—The following statement shows the leave sanctioned and availed of by the Officers of the Department :—

Name of Officer	Kind of leave	Period
1. Dr. Leslie C. Coleman, Director of Agriculture.	Privilege leave ...	From 2nd January 1925 to 14th January 1925.
2. Dr. B. Narasimha Iyengar, Agricultural Chemist.	Privilege leave ...	Fifteen days from 19th April 1925.
3. Mr. N. Sampathiengar, Senior Assistant Chemist.	Privilege leave ...	Six weeks from 15th April 1925.
4. Mr. M. G. Singrachar, Agricultural Engineer.	Privilege leave ...	Fifteen days from 19th August 1924.
5. Dr. K. Kunhikannan, Entomologist.	Furlough leave ...	From 10th February 1924 to 11th August 1924.
6. Mr. E. Rama Rao, Office Manager.	Privilege leave ...	From 2nd June 1925 for 29 days.
7. Mr. Ranganaikulu Naidu, Artist.	Privilege leave ...	Four months from 7th May 1925

*Office.*—The Disposal Number System of correspondence continued to be followed during the year.

#### REPORT ON THE WORK OF THE LIBRARY FOR 1924-25.

The Library still continues to labour under the disability of want of space which detracts much from its usefulness. As it is, the whole building is so fully packed that an extension is an urgent necessity if suitable accommodation is to be found for all the sections where work is growing year after year. The preparation of the catalogue under the Dewey Decimal System according to which the books have, as stated in the last year's report, been classified, was taken up, and Part I of the catalogue is ready for the press.

The accessories to the Library were as follows:—

Journals and Periodicals	..	..	..	1,506
Bulletins and Circulars	..	..	..	504
Reports	..	..	..	150
Books purchased	..	..	..	10
			Total	2,170

The number of Periodicals acquired by subscription or otherwise is as hereunder:—

By subscription	(a) Agricultural Department.	
	(b) Live Stock Section.	
	(c) Miscellaneous.	4
By exchange.		
By presentation by Dr. Coleman.		1

The number of books lent out to people unconnected with the Department during the year is 114.

Agricultural Calendar for 1925 is the only departmental publication that was issued during the year.

H. V. KRISHNAYYA,  
For Offg. Director of Agriculture.

#### REPORT OF THE AGRICULTURAL CHEMIST FOR THE YEAR 1924-25.

*Charge.*—I have been in charge of work in Chemical Section during the whole year.

*Staff.*—There have been no changes in the staff during the year under report.

*Leave.*—I was on privilege leave for 15 days from 19th April 1925. Mr. N. Sampathiengar, Senior Assistant Chemist, was on privilege leave for 6 weeks, from 15th April 1925.

*Tours.*—I was on tour for 72 days, inspecting experiments on the various farms of the Department and also on the Palace Dairy Farm at Rayanakere. Mr. N. Sampathiengar spent 104 days in attending to the work of field experiments on the Babbur and Marthur Farms.

*Correspondence.*—This is, as usual, mostly of a technical nature, and 609 letters were received and 706 sent out during the year.

*Pot Experiments.—Manurial Requirements of Red Soils.*—This is a repetition of the work done last year, but with soil from a bit of arable waste land on the Hebbal Farm. For want of a sufficient number of pots only ragi was used as the experimental crop. The yields from the unmanured pots in the two years showed that the soil used in 1924-25 was a more fertile one than that used in 1923-24. In spite of this, the soil used in 1924-25 has shown better response to plant foods added than the one used in 1923-24. The response to nitrogen alone in 1923-24 was better than that in 1924-25. Coming now to the response to the phosphates added, the soil used last year had not responded, whereas the virgin soil used this year has distinctly done so—a fact quite in accordance with the previous manurial history of the soil used last year. The slight response to potash manuring shown by soil used in 1923-24 was not present in the virgin soil used in 1924-25.

Taken as a whole, the results of experiments with a virgin soil this year have shown a good response to nitrogenous and phosphatic manures and practically no response to potash manures.

The different behaviour of the two soils used for experiments in the two years under discussion with regard to phosphatic and potash manuring may be due to different amounts of available phosphoric acid and potash in them. A new method to find out these two available plant foods in soils by the analysis of seedling plants grown in them under certain conditions has recently been developed in Germany and is being tested here to find out the suitability for our needs, of the standards fixed in determining the manurial requirements of soils in Germany. A report on the results obtained will be made when the work has progressed sufficiently.

The consideration of an important point has arisen during these investigations, namely, the ratio of nitrogen to phosphoric acid which should exist when both these plant foods are supplied as manure. In a recent article on the importance of artificial manures to German Agriculture, Professor Lemmermann of Berlin has stated that for a good utilization of these two manures by crops, the ratio of nitrogen to phosphoric acid in the manures applied is to be 1:3. Experiments in this direction have indicated that, for our conditions here, a ratio of 2:3 is to be maintained which means that our soils are not so deficient in phosphoric acid as in nitrogen. This point will be further investigated, not only in pot experiments, but in field experiments as well.

Results of experiments on the manurial requirements of red soils carried out since 1922 indicate that, though every soil has responded to nitrogenous manures, yet the phosphate and potash requirements have been influenced by its previous manurial history.

*Decomposition of Bone-meal.*—Experiments in this direction are being carried out since 1922-23. The results indicate that fine steamed bone-meal applied with castor-cake and sulphate of potash is as useful to crops as superphosphate mixed with sulphate of potash and sulphate of ammonia. The results obtained in previous years that castor-cake and sulphate of ammonia are the two useful sources of nitrogen to be applied along with bone-meal, have been confirmed this year also. In the light of experience thus gained, arrangements are being made to start field experiments using bone, castor-cake, and sulphate of potash as the ingredients for a mixture to be used as manure for ragi. Such a mixture might be especially useful in parts where farm-yard manure is not available in sufficient quantities.

*Availability of Basic Super.*—As stated last year, this series of experiments was started to see if basic super could be used instead of acid super on soils poor in lime and humus, but rich in iron and alumina as our red soils usually are. This year's figures confirm the results obtained last year—that basic super is at least as available as acid super. These experiments are now being tried on a field scale also on the Babbur and Marthur Farms with sugar-cane.

*Experiments with Paddy.*—A series of pot experiments to find out the manurial requirements of paddy was carried out in 1923. For want of pots they could not be repeated this year; but arrangements have been made to carry them out in future in bottomless concrete cisterns 3' square and 1' deep sunk in the ground. The first crop of paddy, to study the soil fertility under uniform treatment in 25 such cisterns put up, has been harvested and arrangements are being made to start experiments using manures in doses comparable to what can be applied on a field scale. If this equipment works satisfactorily, it will be extended for work on sugar-cane as well.

*Field Experiments—Manurial Requirements of the Areca Palm.*—The first series of experiments which were started in 1920 were continued for three years on the same lines. The results showed definitely that nitrogen and potash are needed for the areca palm.

To study the residual effects of manure applied and also the necessity or otherwise for phosphates, a new scheme of manuring was drawn up and put into effect in October 1923. The results of the harvest in 1924 indicate that the previously manured rows have not suffered in the least though left unmanured since 1923. The manures applied between 1920-23 seem to be still acting as shown by an increase in crop, specially in the two series manured with potash in addition to nitrogen and phosphoric acid.

The result of manures applied in 1923 to rows not previously manured indicates that the addition of super to nitrogenous and potash manures has not had much influence on crop yields. This confirms the indication of previous years that areca seems to respond only to nitrogen and potash.

*Manurial Requirements of Sugar-cane.*—Experiments on the Marthur Farm have distinctly shown that the influence of super and lime on the crop is very great. In addition to continuing these experiments new ones on the comparative availability of basic and acid super have also been started.

Experiments on the Babbur Farm do not show any marked increase in crop as a result of lime application. Both the varieties of cane experimented with—J. 33 A. and H. M. 544—have shown good response to nitrogenous and phosphatic manures. The results of the application of potash manures during four seasons of experiment are not consistent with one another. The reasons for such variations are being investigated. Taken as a whole, the results show the possibility of growing a good crop of cane beyond 30 tons to the acre—in the Marikanive Tract.

*Manurial Experiments with Paddy.*—Experiments on the Marthur Farm for three seasons have shown that manures applied beyond 100 lbs. of sulphate of ammonia and 140 lbs. superphosphate to the acre do not contribute to increased yields and that groundnut oil-cake is as good a source of nitrogen as sulphate of ammonia.

Experiments on the Hebbal Farm for two seasons indicate a necessity for manuring paddy with nitrogen and phosphoric acid. Of the various paddy mixtures tried, a mixture of super with groundnut or castor-cake has proved a good manure for paddy. Though bone-meal has not shown itself as good a source of phosphoric acid as super, yet its utility is increased when mixed with castor-cake instead of with groundnut cake—a confirmation of indications obtained in pot experiments in previous years.

Taking advantage of all these indications and results, experiments on a very large scale were conducted on a block of 27 acres of land near Hampapur, the landlord himself generously defraying the whole cost of manures. Of the mixtures tried, the one containing castor-cake and superphosphate gave a maximum yield of 1,800 lbs. grain to the acre. Next in rank stood a mixture of groundnut cake and basic super and a mixture of honge-cake and acid super stood last.

The total yield over an area of 25 acres in 1923-24 was only 6,400 seers of paddy, whereas, in 1924-25, the season when manures were applied for the first time, the yield went up to 19,400 seers, an actual trebling of the produce due entirely to manuring with artificials.

In spite of this high yield, the average acre yield of grain and straw from the whole area is not so high as that from old paddy lands. The reason may be that these

lands were poorly cultivated for over 9 years and the transplanting was also done one month later than usual. Besides, other difficulties had also to be overcome, as this was the first year the lands came under experiment.

Applications of manures even after two or three weeks from time of transplanting had not had any deleterious effect on the crop. But a uniform application of manure to a standing crop is difficult, and the chances of some of the manures being washed out by careless irrigation are great.

The above results amply demonstrate the utility and profitability of the use of artificial manures in areas newly brought under irrigation and where the supply of farm yard and leaf manure is scarce. The cost of manure applied was about Rs. 25 an acre or Rs. 625 for the whole area. The increased produce was 130 pallas of paddy valued at nearly Rs. 1,300. Leaving out of consideration the value of increased straw production, the net profit from the use of manures was Rs. 675.

The lands being leased out for cultivation on the share system, the profit of the land-lord has been materially decreased as he had to bear the whole cost of the manures, whereas, the raiyats got a good profit without any investment on their part. But this is a matter to be mutually agreed upon between land-lord and tenants.

The land-lord has again generously consented to bear the cost of manures and the experiments are being repeated in 1925-26 as well.

*Soil Studies.*—Want of staff to do the necessary analytical work has been the chief reason for not being able to take up this important work till now. As it cannot be postponed indefinitely, it has been arranged to reduce potculture work to only one crop in the year and utilise the time so saved for this work. Accordingly a beginning was made in studying the fixation of phosphates by soils and their subsequent availability to crops. Preliminary experiments with a black soil, a red soil and a paddy soil have shown that soluble phosphatic manures like superphosphate are absorbed most by black soils and least by red soils. In a series of experiments conducted, it was found that a 8 inch column of black soil weighing about 250 grams fixed all the phosphoric acid contained in 4.5 grams of super, whereas a paddy soil under similar conditions required 4 grams of super for its saturation with phosphoric acid, while a red soil could fix phosphoric acid contained in about 0.5 gram of super. This varied power of fixation has a very important practical bearing. Under ordinary conditions of manuring, the phosphoric acid contained in super applied to red soils might easily get washed down beyond the root range, whereas in black soils and paddy soils, if it is not buried deep enough at the time of application alone, most of the phosphoric acid might get fixed in the upper layers and not reach the roots at all. Under such conditions it may be advisable to use insoluble phosphates on red soils and supply soluble phosphates to black soils and paddy soil, taking care at the same time to bury them deep enough so as to get fixed within the root range of crops. These are only indications and surmises at present and the question will be discussed in all its aspects when sufficient experimental data have been obtained. In addition to a study of this movement of phosphates when applied to different soils, the rate of subsequent availability of phosphoric acid so absorbed will also be studied in the laboratory first and then in pot as well as field cultures.

Analysis of soils also will be taken up regularly hereafter. As already stated under pot-cultures, determination of available phosphoric acid and potash in soils, by the analysis of seedlings according to the method of Neubauer has also been started and will be continued regularly. In addition, a biological analysis of some typical soils will also be attempted.

Quite a large number of soil moisture determinations from every six inches bored, to a depth of six feet have been made in previous years in most of the plots in ragi area at Hebbal. This year the standing crop of jola at Babbur was not very uniform even in areas where the soil looked to be uniform to the naked eye. To find out whether this was due to want of any sub-soil moisture, and also to study water movements in black cotton soil, it was decided to bore out samples from different fields in the dry area to a depth of six feet and determine moisture in every six inches. Accordingly, a beginning was made in March and it is intended to continue the boring every month for 12 months.

The results promise to be interesting. The best soil we have on the Farm strikes rock at a depth of 3' 6" and some others at a depth of 1' 6". This was quite unexpected. The results will be reported upon next year.

*Sandal Spike.*—Analysis of samples of oil referred to in last year's report has been completed and the indications then obtained that there is not much difference in the quality of oil from various classes of wood obtained from healthy as well as diseased trees have been confirmed. In only one single instance was the solubility in alcohol not satisfactory and the reasons for the same are being investigated.

It is rather difficult to draw any definite conclusions with regard to distribution of oil in various parts of the stem of the sandal tree. Without entering too much into details, it might be said that the indications are that in spiked sandalwood, the core to a height of at least four feet from the ground contains less oil than the healthy.

There seems to be some marked difference in the constituents of leaves from healthy and diseased sandal tree and attempts are being made to separate and identify them.

*Feeding Experiments.*—Experiments with milch cows and young calves as reported upon last year are being continued. The results obtained are being worked up for publication in the journal of the Mysore Agricultural and Experimental Union. In addition, all the half-bred cows in their first period of lactation are kept under observation with regard to milk yield and butter fat content.

The following is a Statement of Analytical Work done in the Laboratory as well as in Camp :—

Nature of sample	Number examined	Number of determinations
<b>I. AGRICULTURAL.</b>		
Crops from Pot experiments	554	980
Soils	29	357
Manures	25	76
Fodders and feeding stuffs	251	266
Areca samples	18	432
Sugar-cane juice and jaggory	170	510
Miscellaneous, including samples from the Stores Purchase Committee.	20	218
Fresh dung from digestion experiments	132	396
Milk	3,662	1,231
Weighings of animals, etc., in feeding experiments	...	6,300
Spike Investigation	48	323
Total	4,909	11,089
<b>II. GEOLOGICAL.</b>		
Assay for gold and silver	5	25
Chrome ores	13	28
Manganese ores	19	104
Iron ores	2	18
Iron ores for Bhadravati Iron Works	6	11
Blast Furnace Slag	1	22
Kankar	5	38
Rocks	2	28
Graphite Quartzite	1	3
Garnet	1	3
Copper Ore	1	3
Total	56	283

In conclusion, I desire to acknowledge with thanks the hearty co-operation of all those associated with me in work.

B. NARASIMHA IYENGAR,  
*Agricultural Chemist.*



## REPORT OF WORK DONE IN THE MYCOLOGICAL SECTION DURING 1924-25.

Although I was in charge of the section throughout the year, my work in connection with the preliminary work on the proposed experimental station for coffee entailed long periods of absence from headquarters and during those periods Mr. M. J. Narasimhan remained in charge of the current work of the section. It may be added that, as a recognition of his work, this officer was granted a higher pay than the one he was drawing prior to the date of the Government Order No. I. C. 6161-2—A. & E. 157-24-3, dated 13th March 1925.

*Areca Koleroga Work.*—During the year, the spraying work was extended over a much larger area than that of previous years. The loss of crop due to the disease was very heavy in the unsprayed areas. Work was greatly handicapped during the year, as many of the garden owners had to attend to the damages caused by the floods.

The Agumbe experimental garden continued to be free from disease this year also, which is the 11th year since any spraying was done here.

As has been pointed out by me in previous reports, the disease has been spreading in new areas in the Sringeri and Koppa Taluks in the direction of Kalasa hobli, which is a rich areca-growing area, and which has been free from disease all these years. Report was received during the year that two gardens in the Kalasa Hobli were affected. As the report was received very late in the season, it was not possible to ascertain if the dropping of the nuts was due to the Koleroga disease. This area will be kept under observation during the next season.

The following Statement shows Talukwar, the areas sprayed in the affected areas during the 1924 season as compared to that done during 1923.

Year			Sagar Taluk	Nagar Taluk	Tirthahalli Taluk	Koppa Taluk	Total
			Acres.	Acres.	Acres.	Acres.	Acres.
1923	..	..	1,155	850	520	201	2,726
1924	..	..	2,784	1,486	872	361	5,503

Nine hundred and fifty garden owners took up spraying during this season. We sold 350 sprayers though they arrived late after the spraying season. There were 23 Koleroga Depots during the year. Garden owners of South Canara and of North Canara over the Mysore border, were supplied with 30 sprayers and chemicals sufficient for spraying 220 acres of garden. The total transactions by sale of sprayers and chemicals during this season amounted to Rs. 27,000. It is estimated that the value of crop saved by spraying amounts to 15 to 16 lakhs of rupees.

During 1925 season, an area of about 2,000 acres of garden have been sprayed by the end of June.

The use of casein in place of resin and soda as an adhesive has been more widespread than last year. About 1,800 acres of garden were sprayed with the casein-Bordeaux mixture, as compared to 200 acres of the previous year. Experiments were tried this year to test the efficacy against the supari koleroga, of a new mixture, *viz.*, Martini's Bordeaux solution. (Potash alum was added to weak Bordeaux mixture). On the Marthur Farm 4 rows of the garden were treated with this mixture, casein being used as an adhesive on two of the rows and resin-soda as an adhesive on two others. This was also tried in a garden at Hulimane, Sagar Taluk, for about 150 trees. In both the cases the disease did not appear. It is proposed to try this mixture on a larger scale next season. The advantage in using this mixture is that the cost of the chemicals required for spraying will be reduced by Rs. 2 per acre.

*Coffee Investigations.*—This can be grouped under three distinct heads, the first of which comes under remedial measures against diseases, the second, preliminary work in connection with the opening of the coffee experimental station and the third, a study of the cultivation methods and selection of seed for future plant-breeding purposes.

(i) As usual the disease that has received the greatest attention has been the black rot of coffee. Control measures carried on against this disease were very

encouraging last season and accurate data obtained on the yields of coffee in the sprayed plots as compared with the unsprayed areas indicated that there was a net saving of 100 rupees per acre in the treated areas. The cost has been estimated at Rs. 9 to 11 per acre and the difference ought to be sufficiently convincing. Another proof of this recognition of the advantages of spraying is evinced by the greater demand for spraying in the coffee areas this season. All the applications for help in this direction could not be handled to the satisfaction of the applicants owing to the delay in the receipt of the materials for spraying. The stock of copper sulphate was received as late as the 3rd of June and between then and the outbreak of the monsoon, the period was very short. However, spraying work has been carried on at Koppa, Mudgere, Chikmagalur and Saklespur, an area of nearly 8,000 bushes having been sprayed in all. In addition to the area treated by the Department, encouragement has been given to private owners to do the work on their own account and materials for spraying 35 acres of land has been sold to four planters and instructions given for work. One important feature about the spraying work this season has been the replacing of the resin-soap mixture by the casein-lime mixture which has given very satisfactory results till now. An article about the additional hosts for this pest was published in the Journal of the Agricultural and Experimental Union.

(ii) Preliminary work on the laying out of a coffee experimental station near Balehonnur was taken up and an area of 17 acres placed at the disposal of the Department by Mr. C. S. Crawford was worked up in detail with regard to the yields. All the rows were numbered and yields calculated row by row for the three harvests and tabulated gave us a favourable idea about the suitability of this land for experimental purposes. In consultation with the Agricultural Chemist, a plan of manurial experiments was drawn up and the plan was duly approved by the Director of Agriculture. The necessary quantities of manures have been obtained and the requisite labour for working this Farm has been secured—thanks to the generous gift of Rs. 2,000 by the United Planters' Association of Southern India. The extension of this plot into a 200 acre Farm has been under contemplation and the preliminary surveys for isolating this area of land as a compact block have been finished. The whole proposals are now awaiting the sanction of Government.

(iii) Extensive tours were made in the coffee growing areas of Mysore and Coorg with a view to studying the variations in the methods of cultivation practised in the different coffee-growing areas of Mysore and Coorg as well as investigating the possibility of finding out new or promising strains with a view to using them as a basis for future plant-breeding work. Over forty different strains have been selected and the plants are thriving well in the nursery in baskets. A portion of the jungle has been cut and the rest is being got ready as soon as possible for planting the basket seedlings. A preliminary study has also been made with regard to the validity of the opinion held by some of the planters with regard to the beneficial or adverse influence of the various shade trees on the estate. When the farm should be fully established, a block will be set apart for testing the effects of the various shade trees not only as affecting the yield of coffee but studying their relation in the estates as alternate or auxiliary hosts of pests and fungus diseases.

It is expected that similar visits in the years to come will bring to light a number of useful strains which can serve as additional material for plant-breeding work.

*Investigations on the Smut of Ragi.*—This disease was studied in some detail and sowings were undertaken in the laboratory and in the Dodballapur Taluk to test the efficacy of various methods of treatment against this disease. While many fungicides were employed, the result was negative practically in every case and this information taken together with information gathered in the previous years has given us a clue with regard to the method to be adopted in controlling this disease. Additional work will be done this coming season for combating this disease, but at present the information available can be summarised by saying that infected seed must not be used for sowing in the affected area.

*Betelvine Mildew.*—As a result of work done last year in Kolar, the garden owner has been persuaded to permit us to repeat the experiment in the same garden and spraying was carried on on a small area. The result has been satisfactory and

the use of this method of combating the mildew can be safely recommended in areas where its effect is such as to reduce the market value of the better class of betel leaves. In the case of the inferior sorts, the market value realised does not justify the employment of this mixture.

*Other Diseases.*—A little work was done on the anabe of arecanut, stem-bleeding disease of cocoanuts, leaf rust of Chrysanthemum and leaf rust of grape vines, but in the case of the first two diseases continued work was not possible owing to want of staff and in the case of the two latter ones, spraying was done and the results were reported as favourable.

*Teaching Work at Hebbal School.*—The teaching of Botany and Mycology in the Hebbal Agricultural School was done by Mr. S. V. Venkatarayan except during the first few weeks when I was in charge of teaching these subjects as well as Zoology and Entomology.

I wish to express my cordial appreciation of the services rendered by the members of this section oftentimes under adverse conditions. The success of work in this section is largely due to the carrying out of work in the field for which the subordinate staff is responsible and the work has now progressed so fast that a considerable strengthening of this establishment will be necessary in the near future to cope with the work.

M. K. VENKATA RAO,  
*Mycologist.*

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#### REPORT ON WORK DONE IN THE ENTOMOLOGICAL SECTION DURING 1924-25.

*Kamblihula (Amsacta albistriga. Wlk).*—The campaign against this pest was continued on the same lines as last year, the raiyats finding the money for the moths picked and the Department for payment to the temporary fieldmen engaged. Work was done in 43 villages covering over 12,000 acres. A statement showing the number of moths and caterpillars caught is appended, from which it will be seen that a total 179,157 moths representing 80 million caterpillars were caught and destroyed. The voluntary contributions from the raiyats amounted to Rs. 800-4-0, of which only Rs. 520-7-4 has been spent. This handsome contribution is an index to the popularity of the remedy recommended by the Department.

In Shimoga and Chitaldrug Districts where the raiyats had been left to themselves, the handpicking was not done efficiently or continuously and some villages suffered serious damage. It is hoped that this experience will stimulate the raiyats in the areas affected to better organised and more sustained efforts next season.

*Sugar-cane Borer (Diatroea spp).*—This pest in the Babbur Farm was negligible and no operations were conducted there, but a plot was sown in June later in the season to see whether lateness of sowing is a factor in the incidence of the pest on the Farm where cane is planted early in January. New traps made of coarse palmyrah fibre were tried, but they failed to attract the moths.

*Mango Hoppers (Idiocerus spp).*—These have continued to baffle attempts to control by simpler methods than spraying. Pyrethrum has already been reported as having been found effective. A new insecticide was also tried and found equally effective. But the covering of a mask as a precaution seems to be necessary and as a suitable one has not yet been obtained, the remedy has not been tried on an extensive scale.

*The Rhinoceros Beetle (Oryctes rhinoceros).*—It was mentioned in last year's report that a new line of attack has been found which would be tested. This was based partly on the feeding habits of the adult beetles which have not been hitherto elucidated and in part on the procedure adopted by them in their initial excavation into the palm. From these it was concluded that any distasteful liquid sprayed into the base of the fronds would keep away the beetles. Extensive experiments were made on an estate in Garudapalya. The immunity of the treated areas was quite marked but only for about two weeks during which the growth of the trees

proceeded appreciably to produce areas with no chemical where the beetles started excavation. This would necessitate spraying at intervals and while this is by no means costlier than the ordinary remedies practised and certainly less tedious, it was considered advisable to turn to other methods of control based on the same principle. There has been yet no opportunity to test these methods on a field scale. Efforts are also being made to attract the beetles to suitable baits provided in such a way that the beetles can feed in the way natural to them. In bait experiments hitherto conducted in other parts of the world, the point that beetles can feed only in one way and no other has not yet been considered. It is hoped that one or other of the methods now in view will be found successful. It is unfortunate, however, that experiments have to be postponed for want of adequate staff.

*Coffee Borer (Xylotrechus quadripes).*—The handpicking of coffee borer was tried again on two estates on 5 acres in one and 8 acres in another. The total number of beetles caught from two estates numbered no less than 8,135. Dissections showed a very large percentage of the females had not laid eggs. The result of the work as judged by the number of trees pulled out from the experimental and check plots is not yet available as the dying trees are pulled out only in July. A great deal more information has to be collected before recommendations can be made to the planting community. For this purpose it is proposed to take up a whole estate this year where the entire area will be picked. An Indian planter has come forward to find a third of the expense, the department finding two-thirds, and it is hoped that work will be started on the estate next borer season.

*The Lime Tree Borer (Chelidonium cinctum).*—The remedy against this pest was demonstrated in 24 villages. The growers in these villages are now familiar with the simple operation required and in a good many of them the affected twigs have been removed. It is unfortunate that for want of staff demonstrations could not be extended outside Bangalore District.

A great deal of information regarding the life history has been gathered. An extensive series of adult beetles has been obtained which shows the range of variation to be very wide. Parasites attacking eggs have also been obtained. Statement II gives a list of villages where the remedy was demonstrated.

*Orange Borer.*—Arising out of the remedy devised against the lime tree borer, a request was made by the Coorg Government for my services to study and report on the serious pest of orange known hitherto as *Chloridolum alcmena*. My observations showed that the pest is the same as the lime tree borer though regarded till now as different from it. The same remedy will apply, therefore, to both. A report suggesting the lines of campaign to be followed to eradicate the pest in three years is now before the Coorg Government.

*The Lady Bird Beetle on Potato.*—Investigations have been commenced to control this serious pest of potato, brinjal and other vegetable crops. The potato-growing areas were visited; the alternate host plants of the pest have been collected and an isolated potato crop has been kept under observation. The investigation is intended to find out other ways than spraying and dusting to control the insect.

*The Avare Pod Borer. (Adisura atkinsoni).*—The remedy referred to in last year's report of rubbing off the eggs and young caterpillars of the 1st brood of moths in the year was tested in a village on a fairly large area and it was found to answer fairly well, the crop having been saved from the damage which practically destroyed the neighbouring untreated crops in the same village. The cost per acre did not work to more than Rs. 3. The remedy has the additional advantage of being effective against two other pests which also lay eggs on the avare flowers and pods at the same time and which, though less serious, are by no means negligible.

While this is a simple remedy within the means of the poorest raiyat, investigations have been carried on further to see whether the first brood can be destroyed by other means as ploughing with an improved plough and treating with chemicals the soil against the pupae that remain there.

*A New Insecticide (Calcium cyanide).*—This has been tested against Mango hoppers, rats and ants and appears to be very promising. But there is a danger in careless handling and whether this can be put in the hands of the raiyats as an effective remedy against several common pests is a question which is engaging

attention. In the meanwhile no opportunity has been lost to test its usefulness against pests of various descriptions.

*A Pest of Cardamoms.*—This was not much in evidence during the year to test the remedies devised, on a field scale, but the life history has been partially worked out and arrangements have been made with a planter to test the remedies on the outbreak of the pest in his garden. A closely allied species on grass was also partially studied.

Requests for assistance against tobacco aphid, cabbage pests, potato epilachna, rats and other pests have been increasing and have in all cases been complied with.

Work of a purely scientific character related to a hypothesis in regard to protective resemblance in insects, to the preparation of material intended for bulletins, and to arrangement of insect collections.

In conclusion I have to draw the attention of the authorities once again to the necessity of strengthening my staff by at least three additional fieldmen.

K. KUNHI KANNAN,  
*Entomologist.*

I—Statement showing the Kamblihula moths collected during the year 1924-25. in Kolar District:—

No.		Moths	Caterpillars
1	Deshihalli	7,812	30,300
2	Benganur	3,228	31,900
3	Soregowdanakote	4,558	17,875
4	Nerlikere	3,107	2,220
5	Dasarahosahalli	1,740	13,200
6	Nernahalli	1,104	55,978
7	Wodrehalli	2,170	1,32,055
8	Pillikondnepalli	4,785	28,135
9	Kishnapura	4,726	14,440
10	K. Hosahalli	5,713	48,000
11	Kondapalli	1,614	2,55,000
12	Venkatapura	1,701	17,235
13	Bettagaru	3,145	19,648
14	Gemmrohalli	6,441	49,000
15	Kappalamadgu	159	3,002
16	N. Waddahalli	5,563	7,682
17	Padmaghatta	19,250	26,576
18	Totikal	26,469	46,254
19	Hulyakappa	6,219	88,027
20	Kadikanur	3,240	7,80,265
21	Hodaliyadi	7,082	3,20,281
22	Barandahalli	1,340	1,84,208
23	Moorandahalli	3,965	2,22,440
24	Arehalli	1,033	49,073
25	Zoopalli	14,487	1,67,024
26	Hovalli	3,674	97,350
27	Hograe	13,942	1,71,255
28	Sivapura	8,920	1,83,350
29	Dimba	538	2,787
30	Chamaralli	3,496	6,791
31	Dodhasala	...	...
32	Chikkasala	60	58
33	Kooteri	876	2,877
34	Benganahalli	71	1,151
35	Singondanalli	...	5,525
New areas.—			
36	Udukula	...	...
37	Votarakunte	...	...
38	Pakaralli	6,972	9,480
39	Mallanguru	...	...
40	Reddihalli	...	...
41	Chinkote	...	...
42	Krishnapura	...	...
43	Dinnae	500	...
Total		1,79,157	23,98,259

II—Statement showing the list of villages where lime tree borer remedy was demonstrated :—

1. Narayanapura	13. Mayasandra
2. Binamangalam	14. Anekal
3. Nagavaram	15. Aldhenahalli
4. Juksandra	16. Kodihalli
5. Meadavalam	17. Dodthogur
6. Veerasandra	18. Hosahalli
7. Kebbagodu	19. Yennagere
8. Kelaganahalli	20. Kolathur
9. Attibele	21. Dasanapura
10. Siddapur	22. Domsandra
11. Ramagondanahalli	23. Kemeru
12. Chensandra	24. Chamanahalli

REPORT OF THE BOTANICAL SECTION, HEBBAL FARM, FOR THE  
YEAR ENDING 30TH APRIL 1925.

During the year under review, the total rainfall at Hebbal amounted only to 30·97" distributed over fifty-seven days. Out of this rain, 20·31" fell during the season, *i.e.*, from July to November distributed over forty-two days. The seasonal prospects were good in the beginning but latter rains thoroughly disappointed the crops during the flowering and fruiting seasons. Thus, the groundnut and ragi crops were affected to a great extent by the non-formation of seeds in the pods in the first case and the withering of earheads during the fruit forming stage in the other. However the seasonal conditions got modified to a certain extent even under unfavourable circumstances :—

Name of month	Total rainfall for the month	Number of rainy days			
		Below 25"	25" to 50"	Above 50"	Total number of days
July	3'37	9	1	4	14
August	4'53	7	2	4	13
September	9'64	...	...	6	6
October	1'42	1	3	...	4
November	1'35	3	1	1	5
Total	20'31"	20	7	15	42

*Ragi Varietal Tests.*—Fourteen varieties that were under experiment for the past two years, were tested this year also the results of which are appended in Statement A.

The results of the application of sheep manure at the rate of 4,000 lbs. per acre to the fields of Section II B. could not be seen by the failure of latter rains.‡

*Pedigree Seeds.*—Forty-two selections that were under experiment in the fields 5, 7 and 9 during last year were again tested in the fields 6, 8 and 10. The yields of the above are to be found in the list appended (*vide* Statement A). The average of the yields of the past four years has been struck and it discloses the fact of the

pedigree seeds being superior to check in every way. It requires one more season to draw an ultimate conclusion and reject those that have not done well.

Variety	1922-23				1923-24	
	Grain per acre	Per cent	Straw per acre	Per cent	Grain per acre	Per cent
1	2	3	4	5	6	7
	lbs.		lbs.		lbs.	
Local Hullubele check (gr. op. med.)	735.67	100	943.66	100	606.81	100
C. 3 white open early (majjige)	367.29	46.6	796.66	77.4	293.88	54.2
C. 9 Hasardkambi (gr. open medium)	542.2	70.6	923.32	90.9	433.33	83.1
C. 11 (a) Rudrajadi (v. mutant early)	211.66	27.7	524.99	55.22	246.11	41.9
C. 11 (b) Jadesangha (gr. mut. late)	646.66	91.1	1,028.88	111.2	433.33	68.5
C. 2 Madianagiri II (gr. op. med.)	609.44	87.0	1,148.3	127.3	469.99	73.2
C. 1 Do (v. open late)	518.83	73.2	1,011.66	108.8	550.55	85.4
C. 401 Huthiragi (gr. open med.)	606.10	85.3	990.55	107.1	508.88	81.7
C. 39 Nataragi (v. comp. early)	338.88	47.7	579.99	62.5	472.21	78.5
C. 10 Jenumudda (gr. loose late)	752.21	96.1	1,047.77	111.5	605.55	98.9
C. 8 Gudubele (gr. comp. late)	853.55	114.5	1,264.44	138.9	676.66	110.7
C. 310 (a) violet (open mut. omt. medium)	471.10	64.3	930.55	103.3	525.55	83.9
C. 310 (b) green (open mut. omt. medium)	485.55	67.4	1,019.44	109.3	535.55	84.6
C. 7 Karigidda (v. compact late)	756.08	100.8	1,281.66	128.7	633.33	100.3
C. 3 Majjige. (comp. w. c. late)	369.44	46.0	665.55	60.4	312.22	48.3

Variety	1923-24		1924-25			
	Straw per acre	Per cent	Grain per acre	Per cent	Straw per acre	Per cent
	8	9	10	11	12	13
	lbs.		lbs.		lbs.	
Local Hullubele check (gr. op. med.)	640.9	100	1,152.9	100	1,705.2	100
C. 3 white open early (majjige)	658.33	123.4	966.6	82	1,849.9	107.3
C. 9 Hasardkambi (gr. open medium)	748.32	134.9	1,038.8	95.4	1,649.9	100.7
C. 11 (a) Rudrajadi (v. mutant early)	375.55	62.3	599.9	55.9	788.8	50.2
C. 11 (b) Jadesangha (gr. mut. late)	481.10	74.4	794.4	71.1	1,144.4	70.8
C. 2 Madihanagiri II (gr. op. med.)	720.5	107.9	927.7	77.8	1,833.3	108.2
C. 1 Do (v. open late)	974.4	145.7	977.7	81.6	1,911.0	109.8
C. 401 Huthiragi (gr. open med.)	704.4	108.5	1,038.8	83.8	1,566.5	84.6
C. 39 Nataragi (v. comp. early)	642.7	101.0	877.7	71.2	1,266.6	82.2
C. 10 Jenumudda (gr. loose late)	749.99	119.8	933.3	86.0	1,741.6	102.7
C. 8 Gudubele (gr. comp. late)	938.88	153.3	1,601.1	96.7	1,661.0	99.8
C. 310 (a) violet (open mut. omt. medium)	731.66	112.1	944.4	93.1	1,605.5	97.7
C. 310 (b) green (open mut. omt. medium)	786.5	108.3	977.7	86.3	1,799.9	108.6
C. 7 Karigidda (v. compact late)	715.6	100.0	1,144.4	97.1	1,777.7	103.2
C. 3 Majjige (comp. w. c. late)	403.33	60.1	983.3	79.6	1,372.2	76.7

Early maturing type of H. 22 plants that were selected and sown on the outskirts of II B has proved a fortnight earlier than the bulk H. 22 and it requires some more comparisons with other varieties in the pedigree plots to propose a definite line of action.

*Early Varieties.*—According to Director's advice, ten varieties of ragi were selected and grown to find out their period of growth and superiority or otherwise in respect to check. Out of these, two strains of karigidda (violet compact) and two of hullubele (green open) both evolved by Mr. Badami proved successful. This being the first year of experiment, it requires some more time to draw a final conclusion. The results when confirmed could be made use of in localities where early types of ragi are grown. However, it is proposed to distribute seeds just enough for a gunta of land of all the three types to members of the Agricultural and Experimental Union to test their behaviour under varied conditions of soil and climate.

*Plant Selections.*—The selections that were grown in fields 11 and 13 last year were grown in fields 12 and 14 this year. The yields of these are appended in Statement B. It is seen that only two types have given better results than check this year in field 12 as against seven of last year. In field 14, three types have surpassed check unlike last year by which we may conclude that it requires one more year's test before low yielders are rejected. Hebbal strains and district collections that were given a final chance were grown in Section II, (a) where most of them have superseded check both in the yield of grain and straw. The results of these are appended in Statement C.

*District and North Indian Varieties.*—Last year's experiments were repeated this year also in order to procure fresh seeds of all the District and Northern Indian varieties by growing two rows of each in the outskirts of II A.

*Additional Work on Ragis.*—Study of the inflorescence of the ragi plant was started to see if it could give us any clue in finding out an early type which at the same time yielded heavily. No definite report about this could be given as it is still in progress.

## GROUNDNUTS.

As in previous years, eleven varieties of groundnuts were tested by sowing them in rows both 6" and 12" apart in the land of Section II B and by repeating all of them three times. Insufficient rains in the latter part of the season gave rise to about 50 per cent of empty pods which thoroughly disappointed the chances of seed distribution. Attempts were made to select individual plants containing pods wherein all the seeds have developed but unfortunately we could not succeed. In the matter of spacing, 6" rows have proved better than 12" rows throughout the experiment.

## SPACING TESTS.

Variety	Average yield of pods per acre in lbs.		Remarks
	12" rows	6" rows	
Sogatur	1,523'8	1,988'0	Trailing
Carolina	1,459'2	1,966'6	"
Transval	1,574'0	1,962'8	"
Barbadoes	1,325'9	1,862'9	"
Mauritius	1,390'6	1,725'7	"
Virginia	1,098'0	1,718'2	"
Brazil	1,092'2	1,467'8	"
Pondichery	1,085'1	1,323'1	"
Big Japan	1,043'9	1,331'3	"
Small Japan	736'3	1,088'5	Erect
Spanish	1,021'8	1,389'6	"

*Varietal Tests of Groundnuts.*—All the eleven varieties were tried for comparative yields in Section II B. The results are as follows :—

## COMPARATIVE YIELDS OF GROUNDNUTS.

Variety	Pods Yield per acre in lbs. Rows 1 ft. apart	Remarks
Sogatur	1,755'9	
Carolina	1,712'9	
Transval	1,768'4	
Barbadoes	1,594'4	
Mauritius	1,558'1	
Virginia	1,408'1	
Brazil	1,280'0	
Pondichery	1,204'1	
Big Japan	1,187'6	
Small Japan	912'4	
Spanish	1,205'7	



*Seed Selections.*—The experiments on one, two and three seeds bearing pods were continued this year also. The results are as follows:—

Sown in rows 12" apart. Repeated twice.

Variety	Particulars	Pods average yield per acre in lbs.
Big Japan ... ..	3 seeded from 1 seeded pod	1,176'0
Do ... ..	3 2	1,716'7
Do ... ..	3 3	1,736'3
Barbadoes ... ..	3 1	1,617'0
Do ... ..	3 2	972'4
Do ... ..	3 3	1,881'6
Virginia ... ..	3 1	1,531'4
Do ... ..	3 2	1,741'6
Do ... ..	3 3	1,808'0
Carolina ... ..	3 2	1,766'6
Do ... ..	3 3	1,103'8
Sogatur ... ..	3 2	1,911'0
Do ... ..	3 3	1,122'5
Transval ... ..	3 1	1,730'5
Do ... ..	3 2	1,199'5
Do ... ..	3 3	929'0
Mysore Local ... ..	3 1	864'5
Do ... ..	3 2	832'0
Do ... ..	3 3	808'0
Big Japan ... ..	1 seeded pods	1,613'5
Do ... ..	2 do	1,590'4
Do ... ..	3 do	1,613'5

*Bunch Virginia.*—The observation mentioned in the last year's report as regards Bunch Virginia proving only to be a trailing plant unlike the tufted types grown on the farm holds good this year also. This seemed to be better than the ordinary Virginia in the structure of the plant and pod. An experiment was conducted with Mysore Local having Sogatur as check. The results are as follows:—

II A. Field 14. Repeated four times.

Variety	Average yield of pods per acre in lbs.	Remarks
Sogatur ... ..	2,335'7	
Virginia ... ..	1,782'5	
Bunch Virginia ... ..	1,782'5	
Mysore Local ... ..	1,536'6	

*Relation of the size of Pod to Production.*—Big, medium and small pods of Local and Sogatur groundnuts were tested separately this year also in field 8 of II A to find out if the size has any bearing on the total yield. The results are given below. It is interesting to note that Mysore Local though a late variety, has yielded the heaviest. But it is immature to draw conclusions as it is only the 2nd year of experiment:—

Variety and size	Pods weight in lbs. per acre
Sogatur big size ... ..	1,038
Sogatur medium ... ..	1,211
Sogatur small size ... ..	1,211
Local 4 seeded big size ... ..	1,730
Local 3 seeded medium ... ..	865
Local 3 seeded small size ... ..	821'7

In field of II A, spacings of 6", 9" and 12" eitherway were tried and the results are given below. As usual, 6" rows have continued to give a higher yield

than all the rest. We might take this to be confirmatory as it has continued to give uniformly the highest yield all through five years:—

## SPACING TESTS.

Variety	Year	6" rows apart	9" rows apart	12" rows apart	Remarks
Mauritus ... ..	1920-21	2,420'0	2,112'0	1,947'0	
Sogatur ... ..	1921-22	2,458'2	2,592'6	2,337'4	
Do ... ..	1922-23	1,640'2	1,371'3	1,398'1	
Do ... ..	1923-24	1,032'3	935'5	709'7	
Do ... ..	1924-25	2,096'9	1,806'5	1,306'5	
Average for 5 years ... ..		1,929'54	1,763'58	1,539'74	

*Hybrid Groundnuts.*—Hybrid groundnuts of Hebbal may be divided into two different types (type erect and type trailing) each of which has its own advantage. After great discussion in the section for the past four years, only the erect variety was grown to see if it still continued to produce empty pods but contrary to our expectation it produced fifty per cent less of empty pods than all the other varieties grown on the farm. In spite of this, all the other characters observed by Mr. Badami and written in his report of 1923 still continue to be exhibited. By our observation, we can safely predict that it is capable of replacing all other standard varieties within the space of a few more years. In spite of the fact of there being a great demand for the seeds of that particular variety, it is advisable to conduct further trials with other standard varieties before it is finally distributed to the public. As the seed is not enough for such tests, it requires one more year's trial to produce enough seeds to cope with the demand. The farm authorities have been requested to sow about twenty seers of seeds of that variety from the farm section for seed multiplications. Attempt is also being made to select an early and a completely non-sterile plant in this type.

Noticeable feature of this variety is its high yielding capacity as can be observed in the list appended below:—

Variety	Pods average yield per acre in pounds.
Small Japan ... ..	777'6
Spanish Peanut ... ..	842'4
Hebbal Hybrid wrinkled seed ... ..	2,916'0
" 1 seeded ... ..	2,008'8
" 2 seeded ... ..	3,758'4
" 3 seeded ... ..	2,462'4

*Hybridisation of Groundnuts.*—Due to frequent changes of Inspectors to whom this work had been entrusted, we could not make a complete study of the plants of F<sub>2</sub> generation. About fifty plants of the erect variety, fifty semi-erect and fifty trailing plants have been selected and their seeds preserved for further study during the coming season.

*Sugar-cane.*—One clump each of all the varieties that were reserved has been taken up and regular experiments started with them. The results of these shall find a place in the next year's report.

*Castor.*—Castor work was continued as usual. Avare seed was sown in between rows of castor strains. The results of castor experiments are herein appended (*vide* result of castors).

*Miscellaneous.*—The extension of the garden area that was lying waste for about seven months could not be taken on hand for two reasons, the one was for the retrenchment of labour and the other was due to the water logged condition of the land when the tank was full.

*Irrigated Ragies.*—Garden ragies of different types were tried in wet lands and their comparative yields are given in the appendix. This year there was a great demand by the neighbouring raiyats of the Hebbal village for an early type of garden ragi producing a higher yield than the local irrigated ragi and accordingly seeds of K.I. and Hulimavu sufficient for about two acres have been supplied to them. The results of these are awaited.

REPORT OF THE BOTANICAL SECTION, BABBUR FARM,  
FOR THE YEAR 1924-25.

The area under experiments of the Botanical Section during the current year was about fifteen acres. Our experimental crop was sown in the second week of October, the delay being due to there being an intermediate crop of fodder jola taken soon after a crop of sugar-cane. We received some light showers after the seeds were sown which resulted in the hardening up of the surface soil. The seeds, no doubt germinated inside and could only be made to come up by breaking the upper crust. With frequent interculturings and timely irrigations, we were able to get a moderate crop. Six hundred and twenty-nine disease-free plants with low fruiting branches, big bolls and superior lint were selected among plants in the line cultures. The cottons of these plants have been picked separately and their seeds preserved carefully for future tests. The Mysore-American 4th Variety one of our newly evolved strains, has been coming up quite true to type. To test the merits of this variety we laid out two series of bulk plots, the one with D. A. M. A. 2 and M. A. 3 and the other with Cambodia and M. A. 3. The results of both those have been shown in the Appendices A and B. Besides the above, we have laid out several plots to multiply the seeds of all our improved strains. Our experimental crop of Sannahatti was sown on the last week of August. The seeds germinated quite well and the plants grew vigorous. We selected among line cultures about four hundred plants of the erect variety and about one hundred plants of the bushy type. The work with different crosses was continued as usual. It is interesting to note that in the lines of the  $F_3$  generation of the arboreum cross, two promising plants one with red flower, big boll and high ginning percentage and the other with a yellow flower, big boll, resembling Broach have been selected and the seeds of these have been sown. Among the plants of the  $F_2$  generation, about twenty-five early prolific plants were selected. As usual, Sannahatti bulks, comparative and spacing experimental plots were laid out to test the merits of Selection 69. The yields and other particulars of all these have been recorded in the Appendices C, D and E.

APPENDIX A.

Statement showing the yields of Doddahatti Bulks—First Series.

Plot No.	Variety	Weight of seed cotton per $\frac{1}{10}$ acre		Weight of lint per $\frac{1}{10}$ acre		Weight of seeds per $\frac{1}{10}$ acre		Ginning Per cent
		lbs.	ozs.	lbs.	ozs.	lb.	ozs.	
1	D. A. Sel.	13	13½	4	½	9	7½	29
2	M. A. 2	17	0	6	3½	11	12½	37
3	M. A. 3	21	13	8	2½	10	12½	38
4	M. A. 4	11	0½	3	12½	7	2	34
5	M. A. 2	11	7½	3	9½	7	2	31
6	M. A. 3	21	...	5	15	14	15	28
7	M. A. 4	7	14	2	1½	4	12	27
8	D. A. Sel.	13	½	3	7½	8	13	27
9	M. A. 3	7	7	1	15½	5	15½	26
10	M. A. 4	8	8	2	13	5	14	28
11	D. A. Sel.	9	13	3	0	6	11½	31
12	M. A. 2	10	8	3	0	7	2½	29

APPENDIX B.—SECOND SERIES.

1	Cambodia	20	11	6	15	12	7½	34
2	M. A. 3	20	8	5	7	15	1	27
3	M. A. 4	8	3	2	6	5	9	29
4	M. A. 3	15	5½	4	4½	10	12	28
5	M. A. 4	10	3	2	15½	5	1½	29
6	Combodia	22	9	7	10½	14	11½	34
7	M. A. 4	7	3½	2	1½	5	1½	29
8	Combodia	12	9	4	6	7	7	35
9	M. A. III	11	5	2	15	7	11½	26

## APPENDIX A.

Statement showing the yield of Sannahatti Bulks.

Plot No.	Variety	Weight of seed cotton per $\frac{1}{10}$ acre		Weight of lint per $\frac{1}{10}$ acre		Weight of seeds per $\frac{1}{10}$ acre		Ginning percentage
		lbs.	oz.	lbs.	oz.	lbs.	oz.	
1	Check	12	0	2	10 $\frac{1}{2}$	9	5 $\frac{1}{2}$	22
2	Selection 69	13	0	3	5 $\frac{1}{2}$	9	12	26
3	Do 45	7	3 $\frac{1}{2}$	1	13	5	8	25
4	Check	7	6	1	10	5	10	22
5	Selection 45	4	5	1	0	3	4	23
6	Selection 69	7	11 $\frac{1}{2}$	1	15	5	11	25
7	Check	7	15	1	11 $\frac{1}{2}$	6	2 $\frac{1}{2}$	22
8	Selection 69	7	13 $\frac{1}{2}$	1	15 $\frac{1}{2}$	5	11	25
9	Selection	9	8	2	5 $\frac{1}{2}$	7	3	25
10	Check 45	8	2	1	12	6	1 $\frac{1}{2}$	22

## APPENDIX B.

Statement showing the yields of Sannahatti Comparative Plots.

1	C. Type	11	2	2	15 $\frac{1}{2}$	8	5	27
2	E. Type	11	6 $\frac{1}{2}$	2	13 $\frac{1}{2}$	8	13 $\frac{1}{2}$	25
3	Nadam	12	8	2	4	8	10	18
4	(Chit) Naked	10	6	2	6	8	0	23
5	E. Type	9	5 $\frac{1}{2}$	2	2	7	2	23
6	Nadam	7	10	1	6 $\frac{1}{2}$	6	4 $\frac{1}{2}$	18
7	Chit Naked	10	3	2	5	7	13	23
8	C. Type	8	3	2	$\frac{1}{2}$	5	14	25
9	Nadam	8	15 $\frac{1}{2}$	1	10 $\frac{1}{2}$	7	6	18
10	Naked	7	6	1	10 $\frac{1}{2}$	6	5	22
11	E. Type	8	1	1	15	5	10	24
12	E. Type	9	0	2	2	6	13	24

## APPENDIX C.

Statement showing the yield of the Sannahatti Spacing Experimental Plots.

1	C. Type $\frac{1}{2}$ foot	7	9 $\frac{1}{2}$	1	15 $\frac{1}{2}$	5	13	26
2	E. " "	9	14 $\frac{1}{2}$	2	5 $\frac{1}{2}$	7	11	24
3	E. Type $\frac{1}{2}$ foot	8	16 $\frac{1}{2}$	2	2	6	10 $\frac{1}{2}$	23
4	C. " $\frac{1}{2}$ foot	9	4	2	4 $\frac{1}{2}$	7	0	24
5	Do	7	6 $\frac{1}{2}$	1	13	5	7 $\frac{1}{2}$	23
6	E. Do	6	3	1	7 $\frac{1}{2}$	4	13 $\frac{1}{2}$	23
7	C. Do	7	3 $\frac{1}{2}$	1	12 $\frac{1}{2}$	5	5	25
8	E. Type 1 foot	8	2 $\frac{1}{2}$	1	15	6	4 $\frac{1}{2}$	24
9	Do	6	0 $\frac{1}{2}$	1	7	4	10 $\frac{1}{2}$	23
10	C. Type $\frac{1}{2}$ foot	7	0	1	10 $\frac{1}{2}$	5	4	24
11	Do	6	2	1	8 $\frac{1}{2}$	4	10 $\frac{1}{2}$	25
12	E. Type 1 foot	9	$\frac{1}{2}$	2	1 $\frac{1}{2}$	6	14	23

STATEMENT A.  
Improved Strains of Ragies.

II B field 5 in 1921-22

II B „ 6 in 1922-23

II B „ 5 in 1923-24

II B „ 6 in 1924-25

Variety	Year		Average yield per acre in lbs.		Average per cent yield		Remarks
			Grain	Straw	Grain	Straw	
Local Hallubele. Check	1921-22	...	790.6	1,001.0	100.0	100.0	Green open medium.
	1922-23	...	1,170.72	1,720.0	100.0	100.0	
	1923-24	...	510.44	663.55	100.0	100.0	
	1924-25	...	1,342.7	1,863.1	100.0	100.0	
	Average	...	953.61	1,311.91	100	100	
H. 18	1921-22	...	719.4	1,052.5	110.5	126.9	Green open black grains.
	1922-23	...	1,108.66	1,938.66	97.1	111.8	
	1923-24	...	488.86	694.98	113.8	120.2	
	1924-25	...	2,513.3	2,193.3	113.1	114.6	
	Average	...	957.43	1,469.86	108.6	118.3	
H. 3	1921-22	...	869.5	1,613.6	112.3	169.4	Green open medium.
	1922-23	...	1,191.33	1,986.66	107.0	121.9	
	1923-24	...	624.83	723.73	133.9	107.2	
	1924-25	...	1,520.0	2,053.3	113.9	107.8	
	Average	...	1,051.41	1,594.32	116.7	126.5	
H. 22	1921-22	...	907.4	1,298.7	102.1	111.8	Violet open late.
	1922-23	...	1,095.66	1,998.66	98.8	123.8	
	1923-24	...	658.18	993.21	119.0	132.4	
	1924-25	...	1,276.6	2,090.0	96.2	108.3	
	Average	...	984.46	1,595.14	104.0	119.0	
H. 2	1921-22	...	1,030.52	1,221.9	110.5	101.7	Green open medium.
	1922-23	...	1,528.66	2,067.00	133.3	123.3	
	1923-24	...	761.68	1,031.93	128.3	135.0	
	1924-25	...	1,536.6	2,313.3	108.1	118.6	
	Average	...	1,214.36	1,658.53	120.0	119.6	
H. 13	1921-22	...	852.9	1,496.9	105.2	141.1	Green open. Late black grain.
	1922-23	...	1,404.66	2,310.0	116.1	130.0	
	1923-24	...	569.63	760.91	96.6	104.8	
	1924-25	...	1,532.3	2,266.6	106.1	115.7	
	Average	...	1,090.04	1,708.60	106.0	122.9	
H. 10	1921-22	...	770.8	887.2	108.6	99.9	Green open medium.
	1922-23	...	1,343.0	2,261.0	109.1	126.0	
	1923-24	...	584.96	831.70	104.9	121.2	
	1924-25	...	1,203.8	1,793.2	83.9	92.0	
	Average	...	975.51	1,443.30	101.6	109.7	
H. 32	1921-22	...	856.4	1,011.86	125.6	118.9	Green open medium.
	1922-23	...	1,379.33	2,212.66	111.0	123.5	
	1923-24	...	655.50	835.28	124.4	128.6	
	1924-25	...	1,590.0	2,180.0	113.3	114.8	
	Average	...	1,120.05	1,559.95	118.5	121.4	
H. 19	1921-22	...	893.1	1,037.3	120.1	115.3	Green open medium.
	1922-23	...	1,317.0	2,025.66	108.0	114.2	
	1923-24	...	590.71	849.85	114.4	132.1	
	1924-25	...	1,513.3	2,383.3	110.1	128.6	
	Average	...	1,078.62	1,574.02	113.1	122.5	
H. 39	1921-22	...	876.2	1,015.8	109.5	105.3	Green open medium.
	1922-23	...	1,378.0	1,765.66	114.4	102.1	
	1923-24	...	658.66	819.18	129.1	128.7	
	1924-25	...	1,446.6	2,153.3	109.7	119.3	
	Average	...	1,089.84	1,443.36	115.6	113.8	
H. 40	1921-22	...	983.11	1,138.5	115.9	111.6	Green open medium.
	1922-23	...	1,553.0	1,990.66	128.4	115.4	
	1923-24	...	647.83	748.26	125.0	113.2	
	1924-25	...	1,580.0	2,360.0	122.0	131.4	
	Average	...	1,190.93	1,559.35	122.8	117.9	
H. 72	1921-22	...	...	...	...	...	Green open medium.
	1922-23	...	1,279.0	1,790.66	108.7	107.4	
	1923-24	...	639.78	1,040.36	130.7	159.2	
	1924-25	...	1,350.0	1,856.6	105.4	102.5	
	Average	...	1,089.59	1,562.54	114.9	123.0	
H. 46	1921-22	...	...	...	...	...	Green open late.
	1922-23	...	1,184.66	2,046.68	105.6	128.2	
	1923-24	...	609.11	986.01	130.6	153.1	
	1924-25	...	1,223.3	1,666.6	95.5	92.1	
	Average	...	1,005.69	1,566.42	110.5	126.1	
H. 59	1921-22	...	...	...	...	...	Green open late.
	1922-23	...	1,315.33	1,789.66	123.4	112.1	
	1923-24	...	484.15	638.63	109.4	104.4	
	1924-25	...	1,418.3	1,803.3	113.1	101.6	
	Average	...	1,070.92	1,410.19	115.3	106.0	

STATEMENT A—contd.

Variety	Year	Average yield per acre in lbs.		Average per cent yield		Remarks
		Grain	Straw	Grain	Straw	
H. 73	1921-22	...	...	...	...	Green open early.
	1922-23	1,121.65	1,604.0	101.4	97.9	
	1923-24	664.65	809.98	126.9	136.9	
	1924-25	1,268.8	1,673.3	100.5	96.0	
	Average	968.37	1,362.42	110.6	110.9	

Improved Strains of Ragies.

II. B. Field 8 in 1922-23.

II. B. „ 7 in 1923-24.

II. B. „ 8 in 1924-25.

Local Hullubele	1921-22	1,110.0	1,530.0	100.0	100.0	Green open medium.
	1922-23	946.18	1,221.13	100.0	100.0	
	1923-24	627.59	936.18	100.0	100.0	
	1924-25	1,261.8	1,653.1	100.0	100.0	
	Average	936.39	1,336.35	100.0	100.0	
Check	1921-22	1,257.60	1,433.6	111.6	94.9	do
	1922-23	1,139.66	1,374.33	120.0	119.0	
	1923-24	773.33	1,058.0	119.8	108.7	
	1924-25	1,116.6	1,530.0	87.7	95.6	
	Average	1,071.79	1,363.93	109.7	104.5	
H. 47	1921-22	1,021.0	1,557.0	105.6	133.7	Violet open late.
	1922-23	640.66	1,063.0	93.7	104.8	
	1923-24	1,023.3	1,393.3	81.6	85.2	
	1924-25	894.98	1,337.7	93.6	111.2	
	Average	894.98	1,337.7	93.6	111.2	
H. 57	1921-22	922.0	1,296.0	94.7	111.7	do
	1922-23	524.66	1,060.66	80.4	112.6	
	1923-24	996.6	1,430.0	79.4	87.7	
	1924-25	814.42	1,262.22	84.8	104.0	
	Average	814.42	1,262.22	84.8	104.0	
H. 53	1921-22	1,045.66	1,302.66	107.8	112.9	Green open late.
	1922-23	614.66	1,129.66	102.5	131.9	
	1923-24	1,173.3	1,600.0	92.3	97.3	
	1924-25	944.54	1,344.10	100.8	114.0	
	Average	944.54	1,344.10	100.8	114.0	
H. 62	1921-22	1,059.66	1,403.0	109.2	120.0	do
	1922-23	680.0	1,094.0	119.5	131.0	
	1923-24	1,260.0	1,750.0	95.7	108.0	
	1924-25	959.88	1,415.6	108.1	118.0	
	Average	959.88	1,415.6	108.1	118.0	
H. 69	1921-22	1,235.9	1,463.3	113.5	112.4	Green open early.
	1922-23	1,118.33	1,390.66	114.6	115.5	
	1923-24	614.96	1,021.33	101.5	111.1	
	1924-25	1,226.6	1,546.6	91.4	98.5	
	Average	1,048.94	1,354.22	105.2	109.3	
H. 71	1921-22	688.7	895.9	122.1	135.0	Green open late.
	1922-23	1,102.33	1,355.66	115.1	113.4	
	1923-24	595.0	953.33	96.2	99.0	
	1924-25	1,260.0	1,720.0	94.8	99.9	
	Average	911.50	1,206.22	107.0	111.8	
H. 92	1921-22	652.1	820.3	119.9	114.5	Green open medium.
	1922-23	1,115.66	1,430.33	118.9	122.3	
	1923-24	749.66	1,353.0	122.5	145.7	
	1924-25	1,256.6	1,710.0	96.4	101.1	
	Average	943.50	1,328.40	114.4	120.9	
H. 94	1921-22	834.66	1,263.33	94.2	107.6	Green open late.
	1922-23	651.66	1,029.33	106.3	113.5	
	1923-24	1,096.6	1,556.6	88.2	93.8	
	1924-25	878.44	1,276.43	96.2	104.9	
	Average	878.44	1,276.43	96.2	104.9	
H. 86	1921-22	1,012.66	1,245.0	105.8	103.6	do
	1922-23	673.66	1,009.69	106.8	118.9	
	1923-24	1,046.6	1,480.0	88.1	89.1	
	1924-25	910.97	1,274.88	98.5	103.8	
	Average	910.97	1,274.88	98.5	103.8	
H. 82	1921-22	778.3	928.9	122.0	117.8	do
	1922-23	1,081.0	1,390.33	111.8	114.0	
	1923-24	725.0	1,199.0	111.5	128.1	
	1924-25	1,166.6	1,596.6	94.8	97.2	
	Average	937.7	1,278.70	110.0	114.2	
H. 77	1921-22	634.1	743.1	108.7	108.9	Green open early.
	1922-23	1,036.66	1,210.88	118.0	110.6	
	1923-24	633.0	957.0	98.1	108.6	
	1924-25	1,160.0	1,536.6	95.7	98.5	
	Average	865.94	1,126.75	105.1	105.4	
H. 87	1921-22	872.66	1,217.66	93.8	103.0	Violet open late.
	1922-23	536.0	1,081.66	94.3	118.8	
	1923-24	1,186.6	1,723.3	99.6	107.7	
	1924-25	881.75	1,340.67	95.9	109.8	
	Average	881.75	1,340.67	95.9	109.8	
H. 70	1921-22	930.33	1,401.33	101.5	118.9	do
	1922-23	671.66	1,136.33	112.0	125.4	
	1923-24	1,130.0	1,816.6	96.6	115.3	
	1924-25	910.66	1,451.42	103.3	119.8	
	Average	910.66	1,451.42	103.3	119.8	

## STATEMENT A.—concl'd.

Improved Strains of Ragies.

II. B. Field 10 in 1922-23.

II. B. „ 9 in 1923-24.

II. B. „ 10 in 1924-25.

Variety	Year	Average yield per acre in lbs.		Average per cent yield		Remarks
		Grain	Straw	Grain	Straw	
Local Hullebele	1921-22 ...	1079.7	1,320.0	100.0	100.0	
	1922-23 ...	494.23	692.63	100.0	100.0	
Check.	1923-24 ...	460.42	696.01	100.0	100.0	
	1924-25 ...	599.2	1,175.7	100.0	100.0	
	Average ...	658.39	971.08	100.0	100.0	
H. 45	1921-22 ...	1,101.0	1,580.0	108.4	110.0	
	1922-23 ...	724.44	1,189.77	102.3	129.8	Green open
	1923-24 ...	505.33	877.33	116.37	136.71	late.
	1924-25 ...	782.2	1,466.6	119.9	118.2	
	Average ...	778.26	1,278.42	111.74	121.17	
H. 55	1921-22 ...	...	...	...	...	
	1922-23 ...	682.21	973.33	109.7	113.6	
	1923-24 ...	450.22	722.66	99.33	106.6	do
	1924-25 ...	653.3	1,257.7	94.3	97.4	
	Average ...	595.24	984.56	101.11	105.8	
H. 64	1921-22 ...	1,206.1	1,867.6	109.4	100.4	
	1922-23 ...	578.22	785.33	102.9	102.9	
	1923-24 ...	492.30	856.8	113.6	119.72	do
	1924-25 ...	675.5	1,324.4	97.8	103.2	
	Average ...	738.03	1,083.58	105.9	106.55	
H. 67	1921-22 ...	...	...	...	...	
	1922-23 ...	501.77	723.10	98.1	105.8	
	1923-24 ...	504.88	648.88	130.6	117.7	Voilet open
	1924-25 ...	493.3	1,044.4	77.8	86.9	late.
	Average ...	499.98	872.12	102.1	109.4	
H. 68	1921-22 ...	...	...	...	...	
	1922-23 ...	483.10	710.21	96.8	108.0	
	1923-24 ...	504.21	874.22	130.8	125.6	Green open
	1924-25 ...	666.6	1,191.1	115.4	106.3	late.
	Average ...	551.30	925.17	114.3	113.3	
H. 6	1921-22 ...	...	...	...	...	
	1922-23 ...	465.32	691.96	94.8	103.0	
	1923-24 ...	472.44	758.22	108.7	111.1	
	1924-25 ...	568.8	1,035.5	101.3	94.0	
	Average ...	502.18	828.56	101.6	102.7	
H. 81	1921-22 ...	...	...	...	...	
	1922-23 ...	476.88	668.88	96.7	99.1	
	1923-24 ...	440.44	643.55	92.9	92.4	do
	1924-25 ...	608.8	1,219.9	106.8	108.3	
	Average ...	515.37	844.11	93.8	99.9	
H. 60	1921-22 ...	1,104.69	1,336.6	105.1	101.8	
	1922-23 ...	540.88	780.88	110.4	110.9	
	1923-24 ...	485.33	848.88	99.5	116.6	Green open
	1924-25 ...	595.5	1,093.3	104.6	95.3	medium.
	Average ...	681.60	1,014.91	104.9	106.1	
H. 56	1921-22 ...	...	...	...	...	
	1922-23 ...	448.44	631.99	97.6	97.1	
	1923-24 ...	548.88	799.99	116.6	112.9	do
	1924-25 ...	582.2	1,162.2	102.1	100.8	
	Average ...	526.5	864.72	105.4	103.6	
H. 52	1921-22 ...	...	...	...	...	
	1922-23 ...	407.55	630.66	92.2	96.9	
	1923-24 ...	507.99	737.77	115.7	109.6	Green open
	1924-25 ...	542.2	1,113.3	95.1	97.2	late.
	Average ...	485.91	827.24	101.0	101.2	
H. 51	1921-22 ...	...	...	...	...	
	1922-23 ...	398.44	637.77	92.97	101.5	
	1923-24 ...	445.77	681.77	101.4	102.9	Voilet open
	1924-25 ...	457.7	1,062.1	82.2	94.6	late.
	Average ...	433.97	793.88	92.1	99.6	
H. 49	1921-22 ...	...	...	...	...	
	1922-23 ...	419.10	633.77	99.2	103.7	
	1923-24 ...	436.44	667.10	91.9	96.8	Green open
	1924-25 ...	444.4	991.0	80.6	89.2	medium.
	Average ...	433.31	793.95	90.5	96.5	
H. 89	1921-22 ...	...	...	...	...	
	1922-23 ...	291.55	591.10	69.9	97.6	
	1923-24 ...	466.66	705.33	80.6	98.8	Voilet open
	1924-25 ...	471.0	1,071.0	80.5	92.4	late.
	Average ...	409.73	789.11	80.3	66.2	
H. 84	1921-22 ...	...	...	...	...	
	1922-23 ...	330.22	581.77	91.2	96.9	
	1923-24 ...	513.77	781.10	98.2	99.5	Green open
	1924-25 ...	457.7	951.0	74.6	79.7	late.
	Average ...	433.89	754.62	83.0	92.0	

## STATEMENT B.

II. B. Field 12 in 1922-23.

II. B. Field 11 in 1923-24.

II. B. Field 12 in 1924-25.

Variety	Year	Average yield per acre in lbs.		Average per cent yield		Remarks
		Grain	Straw	Grain	Straw	
Local Hullubele Check.	1922-23	813.64	1,346.01	100.0	100.0	
	1923-24	213.16	371.02	100.0	100.0	Green open medium.
	1924-25	924.9	1,654.1	100.0	100.0	
	Average	650.56	1,123.71	100.0	100.0	
H. 28	1922-23	662.22	1,072.77	62.9	82.8	Green compact late.
	1923-24	183.88	384.88	112.68	99.06	
	1924-25	716.6	1,344.4	78.8	82.7	
	Average	522.56	934.01	91.46	88.15	
H. 75	1922-23	833.32	1,400.55	118.1	107.3	Green open medium.
	1923-24	237.77	441.21	127.77	116.1	
	1924-25	877.7	1,594.4	91.2	95.4	
	Average	666.26	1,145.38	112.35	106.26	
C. 530	1922-23	932.22	1,270.55	114.3	99.5	Green open late.
	1923-24	235.99	481.44	144.61	163.3	
	1924-25	1,038.8	2,144.4	115.6	109.7	
	Average	755.67	1,299.79	124.83	124.16	
C. 474	1922-23	756.66	1,171.66	94.7	90.2	Violet open late.
	1923-24	186.88	412.44	89.4	108.7	
	1924-25	777.7	1,438.8	84.2	88.3	
	Average	573.74	1,024.30	89.4	95.7	
C. 574	1922-23	651.10	1,214.99	79.9	95.1	Green open L. Sp. Grass type early.
	1923-24	423.68	474.21	115.4	137.3	
	1924-25	827.7	1,588.8	90.1	95.6	
	Average	568.56	1,125.76	95.13	109.33	
C. 571	1922-23	753.68	1,155.55	91.0	88.9	Violet open late.
	1923-24	179.55	371.99	94.7	107.4	
	1924-25	749.9	1,511.1	77.3	88.3	
	Average	561.11	1,012.85	87.6	94.8	
C. 417	1922-23	910.55	1,606.66	110.1	116.5	Green open early.
	1923-24	188.44	389.77	96.4	110.6	
	1924-25	955.5	1,759.9	95.4	102.4	
	Average	681.83	1,228.7	100.6	109.8	
C. 462	1922-23	789.44	1,345.55	95.0	105.1	Green open medium.
	1923-24	248.88	464.88	125.9	131.2	
	1924-25	1,066.6	1,833.3	105.0	103.6	
	Average	701.64	1,214.54	106.6	113.3	
C. 532	1922-23	872.22	1,740.55	103.8	136.9	Violet open late.
	1923-24	223.99	490.21	111.0	131.2	
	1924-25	677.7	1,333.3	84.5	80.3	
	Average	591.30	1,188.02	96.4	116.1	
C. 270	1922-23	504.99	726.10	63.8	54.9	Violet compact early.
	1923-24	124.41	151.55	62.7	70.37	
	1924-25	544.4	1,094.4	64.2	71.2	
	Average	391.27	637.35	63.56	65.49	
II. B. Field 14 in 1922-23.						
II. B. Field 13 in 1923-24.						
II. B. Field 14 in 1924-25.						
Local Hullubele Check.	1922-23	327.30	528.07	100.0	100.0	
	1923-24	137.74	287.56	100.0	100.0	
	1924-25	524.3	1,161.5	100.0	100.0	
	Average	329.78	659.04	100.0	100.0	
C. 362	1922-23	387.77	708.68	121.9	138.4	
	1923-24	148.33	277.55	137.3	112.6	
	1924-25	611.0	1,211.1	112.4	99.9	
	Average	382.36	732.51	123.66	116.96	
C. 271	1922-23	188.38	307.77	58.0	57.9	
	1923-24	32.21	89.99	40.2	45.1	
	1924-25	288.8	694.4	57.4	60.2	
	Average	169.77	364.05	51.86	54.4	
C. 401	1922-23	366.66	666.66	118.1	127.8	
	1923-24	72.2	149.8	80.8	68.2	
	1924-25	444.4	933.3	91.6	82.9	
	Average	294.42	583.25	95.16	92.8	
C. 421	1922-23	422.22	802.21	132.6	191.6	
	1923-24	77.77	166.10	70.7	62.3	
	1924-25	577.77	1,233.3	112.4	108.1	
	Average	359.23	733.87	105.2	120.6	
C. 422	1922-23	367.77	489.44	105.8	93.5	
	1923-24	78.88	162.77	62.4	56.7	
	1924-25	399.9	966.6	75.2	84.6	
	Average	282.18	539.60	81.1	78.2	
C. 563	1922-23	71.69	218.33	29.6	35.8	
	1923-24	31.11	85.11	28.0	32.6	
	1924-25	235.5	466.6	43.7	41.5	
	Average	102.76	290.01	33.7	36.6	
C. 592	1922-23	264.99	741.62	75.3	134.5	
	1923-24	81.94	190.60	52.76	61.13	
	1924-25	411.0	883.2	78.9	77.6	
	Average	252.64	605.14	68.98	91.07	
C. 412	1922-23	427.77	693.68	135.4	135.4	
	1923-24	131.18	258.33	67.9	71.5	
	1924-25	566.6	1,161.0	103.2	98.1	
	Average	375.16	704.40	102.16	101.6	



## STATEMENT C.

II. A. Field 8 in 1923-24.

II. A. Field 7 in 1924-25.

Variety	Year	Average yield per acre in lbs.		Average per cent yield		Remarks
		Grain	Straw	Grain	Straw	
Local Hullubele Check.	1923-24	1,016.84	1,703.85	100.0	100.0	
	1924-25	1,000.0	1,918.6	100.0	100.0	
C. 541	1923-24	1,135.23	1,993.82	114.23	118.53	
	1924-25	997.65	1,670.9	95.9	81.1	
C. 425	1923-24	175.04	2,251.52	100.46	125.66	
	1924-25	1,070.5	1,830.0	95.2	85.7	
C. 357	1923-24	944.12	1,327.04	87.73	77.83	
	1924-25	1,106.7	2,003.6	94.5	90.8	
C. 358	1923-24	1,013.53	1,679.42	86.7	107.83	
	1924-25	904.1	1,873.1	79.3	86.9	
C. 535	1923-24	1,085.21	2,200.81	78.33	141.63	
	1924-25	976.5	1,844.5	101.1	130.0	
C. 322	1923-24	958.87	1,657.61	101.60	101.73	
	1924-25	1,179.0	2,148.3	143.2	168.0	
C. 543	1923-24	1,045.54	1,730.94	106.70	96.80	
	1924-25	940.3	1,719.4	97.2	94.2	
C. 446	1923-24	1,134.05	2,080.41	112.56	112.70	
	1924-25	1,179.0	1,989.1	120.3	103.7	

II. A. Field 10 in 1923-24.

II. A. Field 9 in 1924-25.

Local Hullubele Check.	1923-24	922.68	1,629.94	100.0	100.0	
	1924-25	770.0	1,200.9	100.0	100.0	
C. 417	1923-24	679.69	1,189.02	73.60	75.06	
	1924-25	693.6	1,026.4	94.8	92.3	
C. 449	1923-24	990.09	1,748.04	97.73	109.76	
	1924-25	832.3	1,159.4	118.7	108.6	
C. 424	1923-24	984.93	1,703.64	99.06	102.83	
	1924-25	768.6	1,072.6	100.4	92.8	
C. 572	1923-24	957.28	1,677.02	91.80	94.76	
	1924-25	630.0	898.0	79.1	72.6	
C. 457	1923-24	899.75	1,595.58	93.86	91.66	
	1924-25	607.3	1,118.7	98.5	83.5	
C. 339	1923-24	903.30	1,694.00	104.63	104.76	
	1924-25	876.5	997.6	108.2	76.9	
C. 391	1923-24	1,156.60	1,975.07	147.83	131.36	
	1924-25	749.6	1,009.1	86.5	73.0	
C. 359	1923-24	833.61	1,511.76	109.36	101.23	
	1924-25	922.3	1,136.0	119.9	94.9	

II. A. Field 12 in 1923-24.

II. A. Field 11 in 1924-25.

Local Hullubele Check.	1923-24	658.05	1,205.68	100.0	100.0	
	1924-25	703.6	1,062.0	100.0	100.0	
C. 351	1923-24	801.2	1,517.84	119.20	120.53	
	1924-25	632.5	903.4	101.5	96.4	
C. 469	1923-24	677.60	1,244.42	98.60	98.83	
	1924-25	637.2	935.7	96.4	93.1	
H. 63	1923-24	596.12	689.46	82.0	78.23	
	1924-25	621.1	924.3	69.1	85.7	
C. 350	1923-24	755.04	1,322.12	101.73	99.43	
	1924-25	709.3	1,032.5	102.6	95.0	
C. 463	1923-24	733.10	1,375.10	108.40	115.43	
	1924-25	822.8	1,121.2	117.3	103.0	
C. 334	1923-24	764.72	1,366.22	125.16	126.50	
	1924-25	919.6	1,210.0	121.0	111.0	
C. 422	1923-24	785.69	1,228.60	132.90	139.13	
	1924-25	766.3	1,080.9	115.4	108.2	
C. 389	1923-24	721.16	1,481.84	153.33	138.20	
	1924-25	736.0	1,048.6	108.6	101.2	

II. A. Field 14 in 1923-24.

II. A. Field 13 in 1924-25.

Local Hullubele Check.	1923-24	624.91	1,201.92	100.0	100.0	
	1924-25	838.2	1,184.3	100.0	100.0	
C. 440	1923-24	567.02	1,066.90	95.46	102.63	
	1924-25	802.0	1,124.6	102.2	97.9	
C. 426	1923-24	830.71	1,561.86	138.56	151.50	
	1924-25	728.3	1,041.7	91.0	88.1	
C. 581	1923-24	496.38	811.78	78.66	91.76	
	1924-25	654.5	1,235.4	85.5	111.4	
C. 421	1923-24	659.22	1,414.34	96.56	117.36	
	1924-25	811.3	1,272.3	102.0	121.3	
C. 506	1923-24	633.33	1,014.19	84.93	81.46	
	1924-25	802.1	1,078.6	100.0	90.6	
C. 515	1923-24	506.14	909.34	64.96	70.73	
	1924-25	811.3	1,106.3	95.5	93.2	
C. 569	1923-24	449.01	725.61	61.0	55.36	
	1924-25	765.2	1,060.2	83.5	83.8	
H. 90	1923-24	514.63	953.34	69.73	70.46	
	1924-25	885.0	1,189.3	94.8	85.5	

## STATEMENT C—concl'd.

II. A. Field 18 in 1923-24.

II. A. Field 17 in 1924-25.

Variety	Year	Average yield per acre in lbs.		Average per cent yield		Remarks
		Grain	Straw	Grain	Straw	
Local Hullubele Check.	1923-24 ... ..	680.52	1,207.66	100.0	100.0	
	1924-25 ... ..	754.2	1,082.4	100.0	100.0	
C. 362	1923-24 ... ..	915.54	1,551.75	126.43	121.70	
	1924-25 ... ..	825.0	1,100.0	115.7	105.1	
C. 426	1923-24 ... ..	892.49	1,643.00	142.73	136.16	
	1924-25 ... ..	770.6	1,027.5	107.4	100.4	
C. 526	1923-24 ... ..	840.84	1,612.39	145.20	139.80	
	1924-25 ... ..	919.0	1,178.6	123.3	111.0	
C. 528	1923-24 ... ..	723.76	1,348.85	110.73	110.20	
	1924-25 ... ..	825.0	1,106.1	106.8	100.5	
C. 537	1923-24 ... ..	731.14	1,347.86	110.93	120.16	
	1924-25 ... ..	656.1	1,015.4	88.1	92.0	
C. 542	1923-24 ... ..	774.47	1,399.59	119.90	126.80	
	1924-25 ... ..	755.8	1,046.0	97.3	98.7	
C. 394	1923-24 ... ..	666.85	1,267.41	101.03	113.25	
	1924-25 ... ..	816.0	1,308.9	105.0	124.9	
C. 557	1923-24 ... ..	743.32	1,511.15	111.30	128.53	
	1924-25 ... ..	661.8	979.2	86.2	92.7	

## Early Varieties of Ragies.

II A. Field 2.

Variety	Average yield		Average per cent yield		Remarks
	Grain	Straw	Grain	Straw	
Local Hullubele Check	1,751.2	3,702.6	100.0	100.0	4 m. 15 days
H. 73 or L. H. 7 Sp.	1,804.1	3,876.5	109.2	111.0	
H. 77 or L. H. P. S.	1,746.2	3,608.3	103.3	101.6	
H. 71 or H. K.	1,556.9	2,718.7	93.6	78.8	
C. 688 V. compact...	2,040.8	4,165.8	122.9	118.0	3 m. 15 days
C. 689 do	1,798.8	3,471.5	113.0	100.6	3 m. 15 days
C. 693 do	1,446.4	2,892.9	91.1	83.5	4 months
C. 475 V. mutant	1,560.6	2,672.0	95.7	74.4	
C. 514 Gr. ep.	1,546.3	3,250.6	87.6	89.4	
C. 661 V. comp.	1,535.8	2,866.6	78.5	68.9	
C. 652 do	1,977.7	4,223.7	96.7	100.0	

## Castor Strains.

Selection	Yield per acre in lbs.	Colour of stem
H. 1	210.3	Red
H. 2	245.3	"
H. 3	294.4	"
H. 4	560.8	"
H. 5	280.4	Green
H. 6	175.2	Red
H. 7	140.2	"
H. 8	245.3	"
H. 9	175.2	White
H. 10	140.2	"
H. 11	104.1	Red
H. 12	105.1	"
H. 13	175.2	"
H. 14	315.4	"
H. 15	294.4	"
H. 16	245.3	"
H. 17	224.3	"

## District Collections of Castors.

Strains	Field per acre in lbs.	Remarks
Reg. 151 Mungur	151'2	
Settiahalli	136'08	
C. 2 Hanupanahalli	151'2	
Chittaralu smallest	151'2	
C. 2 small (whittish)	287'2	
C. 63 Channarayapatna	257'04	
C. 67 Hingundanakote	241'9	
C. 4 Bodiguppa	423'3	
C. 285 Veeranapura	166'3	
Chitaldrug No. 3	196'5	
C. 6—5 Channapatna	378'0	
Gangasamudra	196'5	
63 Attibalay	257'0	
S. 60 Bukkapatna	272'1	
Reg. No. 7	181'4	
Reg. No. 5	181'4	
Chitaldrug No. 2 small	166'3	
Chitaldrug No. 1 small	241'9	
C. R .35	241'9	
C. 7 Giddanahalli	272'1	
C. 3 Attibalay	181'4	
Chotanahalli	196'5	
Channapatna medium	272'1	
Sabbanahalli	287'2	

## Irrigated Ragies.

## S. Range—Plots 5, 6 and 8.

Variety	Average yield per acre in lbs.		Remarks
	Grain	Straw	
K. I	440'0	1,078	Green compact early.
K. II	610'5	1,485	Do
Hulimavu	778'9	1,749	Violet mutant early.
H. 41	682'0	1,716	Do late.
H. 42	847'0	1,848	Green mutant late.
Jadesangha	418'0	1,298	Green prolific late.
Jenumudda	572'0	1,386	Green loose medium.

## S. Range—Plots 10, 11 and 13.

Variety	Average yield per acre in lbs.		Remarks
	Grain	Straw	
K. I	742'3	1,864'0	
K. II	991'0	2,674	
Mulimavu	1,011'0	2,270	
H. 41	1,282'0	3,236	
H. 42	929'0	2,823	
Jadesangha	805'0	2,367	
Jenumudda	805'0	2,098	

## Irrigated Ragies.

Plots 20—24.

Variety	Average yield per acre in lbs.		Remarks
	Grain	Straw	
K. I	538.2	1,760.0	
K. II	618.1	1,884.0	
Hulimavu	908.6	2,424.0	
H. 41	923.8	2,583.0	
H. 42	885.8	2,399.0	
Jadesangha	588.7	1,456.0	
Jenumudda	544.3	1,824.0	

V. N. RANGANATHA RAO,

*Assistant Botanist.*

## ADMINISTRATION REPORT OF THE AGRICULTURAL SCHOOL, HEBBAL, FOR 1924-25.

The activities of the School during the year under review has remained much the same as those of the previous year. The School commenced its sessions on the 1st July 1924 with 36 students on the roll including fresh admissions. The number of applications for admission to the School this year exceeded all expectations and we were unable to take in more than 18 to the first year class as the amount of accommodation available was limited.

The number of scholarship-holders this year was 24, five in the diploma class, five in the second year and 14 in the first year class.

The attendance of the students this year has been quite satisfactory.

As regards the sports, several cricket matches were played with the principal teams in Bangalore, and we had varied luck. It may not be out of place to point out here, that there has not been made available any money for sports except the amount we collected annually from the students as fees. It is confidently expected that liberal grants would be made in case of this school, where facilities for such sports ought to be amply provided and this can only be done by liberal Government grant considering the small number of students here as compared with the colleges elsewhere.

There has been made a few additions to the School Library and we did not have as much encouragement as we expected in this direction as the amount of funds allotted for this was very limited.

The annual school day was celebrated on the 13th December 1924, and the function went off quite successfully. Sports were engaged in with the usual enthusiasm and prizes were distributed to the several winners by Dr. Leslie C. Coleman, the Director, who presided on the occasion.

The final examinations of the school were held from 29th April to 6th May 1925. The foreign examiners for the Diploma examination were Mr. S. S. Salimath, the Deputy Director of Agriculture, Dharwar, for Agriculture, Mr. Smith, the Imperial Dairy Expert, for animal husbandry and dairying, and Mr. Govinda Pillay of the School of Engineering for Agricultural Engineering. As a result of this examination, five students out of the total strength of the class of 8 were declared eligible for the diploma.

One of the special features worthy of notice this year is that one of the Agricultural Inspectors, Mr. M. S. Ramachandra Rao, a passed student of this institution when the two years curriculum was in operation, completed the L. Ag. course with the regular students for the diploma and passed with distinction.

The School closed for annual vacation on the 7th May 1925. The re-opening of the School was advertised in the leading newspapers of the State and the *Mysore Gazette*, and forty applications were received by the 15th June 1925. The Entrance examinations of the School were held as usual in the offices of the Deputy Commissioners of all the districts except Bangalore where the examination was held in the office of the Director of Agriculture. Of the 39 candidates that sat for the examination, 13 candidates were selected in order of the rank.

The L.Ag. diplomas for students who passed out last year were not distributed, there being only three of them and we could not be sure if all of them would be present for the occasion. It is expected that those and the students who passed out this year, will be given their diplomas some time this year.

GUNDAPPA S. KURPAD,  
*Vice-Principal.*

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REPORT OF WORK DONE ON THE GOVERNMENT EXPERIMENTAL FARM,  
HIRIYUR, FOR THE YEAR 1924-25.

*Seasonal Conditions.*—The total rainfall during the year was 13·7 inches which is in excess of last year by 2·3 inches but less than the average by 6 inches (*vide* statement I). The precipitation may be considered to have been better distributed than the previous year, though the North East monsoon which should have averaged about 7 inches in October and November fell down to an inch and half. The tract being purely a Hingar tract, the dry land crops were affected therefore adversely.

*Farm Buildings and Roads.*—I beg permission to emphasise again on the need for sanctioning sufficient funds to keep the buildings in good repair. In an attempt to keep the expenses on construction of buildings low, they were treated as temporary, and accordingly the materials used were not meant to stand the inclemency of weather so long. Without repairs for a long time the walls of all the buildings have developed bad cracks and the thatched roofs leak like sieves during a shower of rain. The stores in the wet land, a very old mud roof building, where, during the jaggory boiling season jaggory worth Rs. 10,000 is being stored, in addition to other store materials worth thousands of rupees, had reached a stage of disrepair when the roof fell down burying much of the store articles. The engine house, where are stored the costly machinery such as power gins, engine, tractor, etc., worth at a modest estimate of about Rs. 15,000, is but an open shed with a thatched roof—a poor protection against weather and fire for costly machinery. During the cotton ginning season ryot's cotton to the value of Rs. 25,732 required to be stored in the same shed and it is a pitiable sight to see the ginned cotton in bales lying in the open, in rain, and open to risks of fire. Added to this is the fact that about 3,000 maunds of jaggory worth about Rs. 10,000 is every year manufactured in temporary furnaces, with not even a thatch over the heads of workmen to keep off the heat of the sun.

It may be noted in this connection that 10 cooly sheds fell a prey to accidental fire and the temporary shed used for jaggory boiling and the engine shed narrowly escaped falling a prey likewise during the jaggory boiling season.

Though a system of roads and drains has been worked out within the farm limits, it is regrettable that there is no road connecting the farm with the main road at Hiriyr. This question has got to be taken up early as not a little of the popularity and utility of the farm depends on its easy accessibility in all weathers.

*Farm Machinery.*—All the machinery in general worked satisfactorily during the year. As the machines have got old, they require repairs now and then for which a workshop is felt necessary.

With the gaining of experience over some years, now, the possibility of a large scale introduction of tractors successfully and profitably in the near future is disappearing. The high initial cost, heavy working expenses, difficulty in repairing and renewing parts, low local mechanical skill and added to these, small uneconomical holdings, co-operative farming a factor conspicuous by its absence, undulating fields with varying nature of soils from plot to plot, and plenty of cheap labour are

weighty factors that postpone the day, almost indefinitely, for a thought of general introduction of tractors.

Cotton gins have worked as usual, but it must be noted that due to unsteadiness of the cotton market and the requisitioning of the gins for ginning farm selection, brought by ryots to be ginned separately for seed purposes, the receipts have fallen low. Rs. 1,063-6-7 were realised as charges for ginning ryots' cotton. As already noted under farm buildings and roads, a pucca building to store kappas safely and a good all-weather road leading to the main road at Hiriyur will contribute greatly towards gins being better utilised by the ryots.

It may be worth while to erect a windmill on the farm for test as the farm is situated in an open country which is noted for its heavy continuous winds for about 6 months in the year synchronising with little or no rain period. If this should prove useful, it opens up possibilities of harnessing a natural source of motive power in the lift-irrigated tract of Challakere, Molakalmuru, etc., at a very low cost.

*Live Stock.*—For want of funds it has not been possible to renew the working animals even though they have grown too old to cope up with the heavy work of the farm. The breeding bull was made use of more than last year, the coverings being 35 in number against 13 last year.

In the opinion of the Live Stock Expert in Mysore, the farm is very suitable for sheep-breeding. The Poona ewes were replaced during the year by hybrid Merino-ewes with a good half-bred merino ram. The ram is appreciated much by the local sheep-breeders.

#### CROPS.

*Dry Land.*—Sisal hemp was introduced on an area of 5 acres on one of the poorest soils and the plants have established themselves well. It is a new crop and its progress is watched with interest.

As usual, Bilejola and Sanhatti were grown on 28 and 29 acres, respectively. The yields were 1,219 seers and 121 maunds, respectively, which is a low one. It may be noted in this connection that hariyali is spreading on the dry land and the using of heavy ploughs such as Kirloskar and Gallows (S. A. E. of Ransoms) have not eradicated this pernicious weed. This is a problem, the solution of which is urgently called for.

*Wet Land.*—The main crops, as before, have been irrigated cotton and sugar-cane. Paddy also was grown on share system on an area of 19 acres 19 guntas. As it was found that the triennial rotation of crops of irrigated cotton, sugar-cane, fodder jola and sunnhemp was too crowded, making it difficult to distribute the work equally throughout the year and the lands being poor would not stand heavy cropping without rest and also as no work was being done on paddy, a crop of great local importance, a five year rotation has been sanctioned by the Director to be adopted as follows:—

- Sugar-cane.
- Irrigated cotton.
- Green manure and paddy.
- Fodder jola.
- Fallow and green manure.

This will be followed from the year 1925-26.

#### SUGAR-CANE.

The area under this crop was in all 24.22 acres. The average yield per acre was 20.6 tons of clean cane per acre which is slightly in excess of last year. The yields of sugar-cane under different experiments are embodied in Statements III and IV, Statement II giving the yields of all the plots. It will be seen from Statement III that H.M. 553, J. 33 A. and H.M. 602 a white sport of J. 33 A are high yielders and though H.M. 544 comes fourth in rank, the milling qualities of H.M. 544 is a factor which outweighs the higher yield of tonnage of J. 33 A. and H.M. 602, both of which are reed canes. H.M. 553 seems to be a promising cane, but its qualities are further to be tested before it can replace H.M. 544. Rastali, the local cane, has no chance of standing competition with any of the other canes. It may be pointed out in this connection, a striped sport from H.M. 544, a single cane of

which was got during the harvest 3 years ago, has been multiplied and occupies an area of 12 cents. It is kept under observation as to its various qualities and will be tested against the other varieties next year.

Statement IV speaks in favour of Ammonium phosphate as a better fertilizer for sugar-cane than Ammonium sulphate and the test is being further continued this year.

The results of artificial fertilizers will find a place, as usual, in the report of the Chemical Section.

Trash heaps as traps for sugar-cane moths are being used as a routine operation and its efficiency in checking the depredations of the borer is really high.

In addition to experiments that are conducted on sugar-cane, a further series consisting of spacing and duty water experiments have been added on, during the year.

*Jaggory-boiling.*—Total weight of cane milled during the season was 423 tons 2 cwts. 3 qrs. and jaggory produced was 3,239½ maunds, which gives a percentage of 9.5, which is .3 lower than last year, which has to be accounted for by the fact that the mill-rollers are worn out badly, lowering the percentage of extraction. The cost of manufacturing jaggory has risen slightly as tests with furnaces were conducted and the results will find a place in the Engineer's report.

*Irrigated Cotton.*—The whole of the area was under experiments. Statement V gives details of yields of various strains of cotton under test. In addition to this, about 15 acres were occupied by cottons under the Assistant Botanist.

*Plantains and Cocoanuts.*—The remarks made in my report of last year are being confirmed as to poovan being the only variety that may be said to grow well under farm conditions. Statements VI and VII give the details of yields of the varieties under test, as also the manurial effect on yields.

The coconut plants are thriving well and it is gratifying to be able to report that the attack of the much dreaded rhinocere beetle is almost nil and the cause of attack of a few plants may be directly traced to the fact that the old plantain trees were removed to make way for new planting which opened out the coconut plants to the beetle attack. This confirms the ryots' experience.

*Paddy.*—Nineteen acres 19 guntas were grown under this crop on share system and 32 pallas 65 seers were realised as the farm share.

*Seed Distribution.*—The following gives the details of distribution of various seeds:—

Sugar-cane. (H.M. 544)	...	...	...	44,500	setts.
Jola	...	...	...	250	seers.
				Mds.	lbs.
Cambodia cotton	...	...	...	39	20
Selection 69 ..	...	...	...	78	0
Mysore-American II cotton	...	...	...	11	0
Dharwar-American selection	...	...	...	2	0
Lone star cross	...	...	...	0	16

*Sericulture.*—Owing to success in growing mulberry and rearing silkworms, the area under the crop was extended on the farm by another acre. The fear that the heat of the place is not suited to silkworm-rearing is proving false and the people are evincing interest in this new work.

*School.*—The elementary school that was started last year is proving of great benefit to the children of the farm coolies who consist mostly of Adi Karnatakas, Lambanis and Woddars. The strength of the school is 43 as against 35 of last year.

## I.—Statement of rainfall for the year 1924.

Sl. No.	Month	Rainfall in inches	Number of rainy days
1	January	Nil.	Nil.
2	February	Nil.	Nil.
3	March	Nil.	Nil.
4	April	1'68	2
5	May	0'73	4
6	June	0'83	2
7	July	1'12	8
8	August	4'32	9
9	September	3'67	5
10	October	1'24	4
11	November	0'11	1
12	December	Nil.	Nil.
Total		13'70	35

## II.—Statement showing the yields of sugar-cane crop in different plots.

Plot No.	Variety	Area in acres	Yield of cane calculated per acre in tons	Yield of jag-gory per acre in maund	Remarks
262	H. M. 544	4'3	20'6	162'5	Weight of sugar-cane used for mill. Tons. cwt. qrs. lbs. 423 2 3 9 Weight of sugar-cane used for setts. Tons. cwt. qrs. lbs. 77 1 2 18
502	J. 33 A	1'7	24'3		
508	Varities of canes	3'0	19'8	142'6	
509	H. M. 544	3'7	24'75	178'2	
503-04	H. M. 544	3'0	21'1	138'24	
505-06-07	J. 33 A	5'0	16'5		
	H. M. 602	1'0	20'0	164	
	IV. J. 33 A	2'5	21'2		
Total		24'2	20'6 (average)	...	

## III.—Statement showing the results of varietal tests.

No.	Name of variety	Area in guntas	Yield of clean cane calculated per acre in tons	Remarks
1	H. M. 544	14	23'4	
2	J. 33 A	10'5	30'5	
3	H. M. 553	10'5	32'3	
4	H. M. 376	6'3	19'6	
5	H. M. 602	10'5	25	
6	Rastali	10'5	18	

## IV.—Statement showing the effect of Ammonium Phosphate and Ammonium Sulphate on sugar-cane.

Variety—H. M. 544.

No.	Treatment	Area in guntas	Yield of cane per acre in tons	Remarks
1	Ammonium phosphate	22	22'8	
2	Ammonium sulphate	22	15'78	
3	Check	38'5	17'4	



## V—Statement showing the yields of different varieties of cotton.

No.	Variety	Area	Yield of kappas calculated per acre in maunds	Remarks
1	Cambodia .. ..	13'8	20	
2	Mysore-American II .. ..	6'9	15'3	
3	Mysore-American III .. ..	6'9	22	
4	Lines 403—413 .. ..	6'9	10'9	
5	Lone star cross .. ..	6'9	14	
6	Dharwar-American selection .. ..	6'9	22	

VI—Statement showing the yields of varieties of plantains.  
(Manured vs. unmanured.)

No.	Variety	Number of trees harvested	Total number of fruits	Average number of fruits per tree	Remarks
1	Palya— Manured ... ..	53	1,468	29	Manured with 1 lb. of ground-nut cake per plant.
	Unmanured ... ..	55	1,366	25	
2	Mauritius— Manured ... ..	52	2,645	51	
	Unmanured ... ..	41	1,915	46	
3	Rasabale— Manured ... ..	40	1,184	30	
	Unmanured ... ..	42	989	23	

## VII—Statement showing the yields of varieties of plantains.

No.	Variety	Number of trees harvested	Total number of fruits	Average number of fruits per tree	Remarks
1	Palya ... ..	104	2,826	27*	
2	Mauritius ... ..	82	4,202	51	
3	Rasabale ... ..	60	1,770	29	
4	Poovan ... ..	2,282	1,56,193	68	

\*This was not actually included in varietal tests.

## VIII—Statement showing the yields of Sannahatti sown at different spacings.

Spacing	Area in acres	Yield of kappas calculated per acre in maunds	Remarks
Rows of 3 ft. apart .. ..	3/4	5'8	
Rows of 2 ft. apart .. ..	3/4	4'4	

K. M. GURURAJA RAO,  
*Farm Manager.*

## ADMINISTRATION REPORT OF THE HEBBAL FARM FOR 1924-25.

As in previous years, the farm has been in my charge during the year under review. It has not been found possible to attend to all the details of farm work and these have had to be left to the Assistant Farm Manager and the two Inspectors who form the farm staff. For nearly two years, however, this full strength has not been maintained and for long periods I have had to get on with only one officer. When such unforeseen circumstances as illness intervened, I have had to look after the whole of the farm work myself. This has entailed a great strain on me without any corresponding recompense or relief and I wish to take this opportunity of pressing very strongly that the full complement of farm officers be maintained.

Want of adequate accommodation to all the officers stationed here, as well as making the existing quarters weatherproof, are longstanding complaints and I hope some way will be found of improving matters. The matter of supplying electric lights should be pushed through, so that it will be more easy to prevent deprivations by thieves which has been a common occurrence hitherto. An adequate supply of water, either by having a storage tank to which water is pumped from the Dry area well, or by tapping the Hesaraghatta main which runs within easy reach, is a great desideratum and should be provided as early as possible.

The officers stationed here, find considerable difficulty in properly providing for the education of their children. At stations like Pusa, far from any educational centre, Government have gone to the length of providing special schools and high schools for the children of the employees. Here, where an educational centre is within easy reach, Government ought to provide facilities for the conveyance of the school-going children to and from the schools at Malleswaram which is the nearest point. Provision of a covered cart and a pair of bullocks will meet present needs and I would press for the immediate provision of this facility. Better facilities are desirable and should be provided later on when a closed motor bus might be found to be necessary for meeting all needs.

*Ragi*.—Some of the experiments on ragi having given conclusive results, they were scrapped this year as decided in the Departmental Conference. These are seed selection experiments, different methods of sowing, intercultivation experiments, ragi pure versus ragi with akkadi, avare and jola, and ragi, manurial experiments. Since green manure crops were sown by the time of the conference, the manurial tests had to be continued this year. The plots of the other experiments which were discontinued, were utilised for growing groundnut and togari.

Agricultural operations such as thinning, intercultivating, etc., after sowing ragi, could not be done at the proper time, and had to be done when the crop had almost reached the stage of sending forth ear-heads. The tillering was poor for want of timely rains. No uniform flowering nor ripening of ear-heads were thus observed. Yet the yield of grain on the farm has been very good as compared with the yields obtained on the fields surrounding the farm area. This must be attributed entirely to the thorough tillage that the land received both before sowing and after sowing whenever opportunity occurred for it. Plots were sown as in the previous years in rows about 10 inches apart to admit thorough intercultivation. The usual varieties of ragi were tried along with three other varieties got from the Botanical section as early maturing varieties. Nothing conclusive can be said about these at present. The varieties are H. 71, H. 73 and H. 77.

Considering the low seed rate being used on the farm in the local bamboo seed drill and in the Clipper Drill, germination of ragi in the weather conditions which prevailed was not satisfactory in a few cases.

To find out the effect of depth of sowing on the germination of ragi seed, a few pots were taken and 100 seeds of ragi were sown at different depths ranging from  $\frac{1}{2}$ " to 3". There were four pots for each experiment and the results are given below:—

Depth of sowing	Per cent of germination	Remarks
$\frac{1}{2}$ "	90	This showed that the shallowest sowing was best, that sowing the seed more than 1" deep would result in very uneven germination, and sowing it more than 2" deep would result in very poor germination.
1"	87	
1½"	76	
2"	75	
3"	22	

Experiments to find out the best time to apply Ammonium Sulphate to ragi was taken up this year and the results are interesting especially when we consider the adverse whether conditions after the Ammonium Sulphate was applied at time of thinning.

Rotation of ragi with groundnut is being tried on a small scale as demonstration of a proved good practice, and from this plot a yield of 1,252 lbs. grain and 1877 lbs. straw was obtained as against 461 lbs. grain and 696 lbs. straw in ragi after ragi plot.

*Paddy.*—Experiments to determine the age at which seedlings should be transplanted were scrapped, it having been conclusively proved that 25 days' old seedlings were best and seedlings below 35 days old are best suited for transplanting. These plots were utilized for trial of two Coimbatore varieties obtained from Nagenahally Farm with Alur Sanna as check. One of the two gives a fine white rice. These two varieties are not suitable for the summer crop as they continued growing without putting out ear-heads even when all the other varieties were harvested. Other experiments were continued.

Alur Sanna having given better results when tried with other varieties on a small scale, it was tried as a general crop for all experiments in place of Doddabele, a coarse variety. The yield of this variety has been very satisfactory as compared with the results of previous years, it being as much as 22 pallas an acre.

Having hopes of getting good mango showers and with the help of the water in the tank, summer crop of paddy was planted. The crop did not get a sufficient amount of water though water was available in the tank. The matter was taken up with the Amildar and definite arrangements have yet to be made for the uninterrupted supply of water to the farm. The crop suffered till the mungar rains. The yields, therefore, are not as good as we might have got with a better supply of water.

*Sugar-cane.*—In the year under report experiments on sugar-cane could not be done, the tank having gone quite dry. However, to keep the varieties and seedling canes going, a small area was put under cane, irrigation being given from the two wells in the wet area with engine and pump and Ramachandra Water Lift. Experiments on spacing row to row were scrapped and sett to sett in the row has been taken up this year.

Since cultivation of other plots was not possible without rain or irrigation and with a view to get as much seed canes as possible, the stubbles of the previous manurial and spacing experiments were let to grow as ratoon canes and these were distributed as seed to different places in the State. The crop grew without irrigation till the early showers, when a half ton dose of Ammonium sulphate and half ton dose of groundnut cake were applied and one wrapping was given.

Canes left in the varieties and ratoon crops after supplying the demand and planting on the farm were milled and made into jaggory in the new two pan furnace constructed newly outside the joggory-boiling house and the results are noteworthy. Many ryots from the surrounding villages and visitors appreciated the cheapness of the jaggory-making and the simplicity of the furnace. Boiling could be done with either the trash or megass alone. Nine to 10 boilings, using 300 lbs. juice per charge, can be taken in a day working 14 hours.

#### MISCELLANEOUS.

A mixture of sunnhemp and cowpea was sown in paddy fertilizer plots (1.40 acres) for green manuring other paddy plots and the quantity of stuff obtained, in spite of unsatisfactory germination consequent on the heavy downpour of rain a day or two after sowing, was sufficient to manure about 8 acres at 300 lbs.

Mungar jola sown in paddy and sugar-cane plots were cut and given over to the Dairy for making ensilage, the value of the fodder being nearly Rs. 420.

Onions and garlic were tried but did not come up well. Satisfactory irrigation was not possible and the little crop that was expected was damaged by the continuous mungar showers during April and May.

Groundnut crop suffered badly especially at the time of the formation of pods, resulting in many empty pods which were mostly seen in vergenia.

Weather conditions were not favourable for the castor crop.

Fresh planting of plantain suckers was done along the fence; a few varieties in the bit of land near the wet area well have commenced bearing.

Cowpea crop between togari varieties was a failure owing to want of timely rains.

Some more cocoanut seedlings are to be got from Tumkur or elsewhere to fill the blanks along the fence in the dry area. Standing plants are healthy though these suffer from water-logging when the tank is full.

The present number of pairs of working bullocks is found hardly sufficient considering the amount of Agricultural and other miscellaneous works. About ten acres of the pasture area belonging to the Military Dairy were newly brought under cultivation and fodder crops grown in addition to the fodder-growing area on the farm. About 5 acres in the Jakkur forests were newly brought under the plough for Sisal hemp and frequent cultivations year after year are required. When the Merino hybrids and sheep on the farm were stationed for some months at Maralakunte about 5 miles from the farm, a pair of animals with a cart was wanted every third day to take ensilage and other sheep feeds. The hostel well having gone dry, the supply of water by cart and barrel has to be done for cooking and drinking purposes, though arrangements are made for bathing near the Dry area well.

Three of the working animals were auctioned and one was poisoned for an incurable disease during the year. Four pairs of animals, leaving two Sindhi pairs, have advanced in age and much work cannot be expected from them if retained any more; neither will they fetch a good price. These require to be sold and substituted and two more pairs should be purchased to cope with the heavy work. The plot of ground to the south of the hostel has been laid out into plots and these will be brought under cultivation after ploughing and levelling.

Considerable damage is being caused to paddy and other grains in the barn house through rats and sparrows for want of sound stores and granaries. If some more granaries are constructed with suitable lids for each, damage will be prevented to a considerable extent.

Since the road between C. and D. ranges in the wet area is below the level of the plots on both sides, part of it is always under water. During the slack season in the year, this road has been raised to some extent and arrangements are being made to complete it and raise it further with the help of the raiyats who seek permission to take the produce from their lands adjoining the farm fence, through the farm roads and gate.

Much difficulty is being experienced in drying the grain and straw plot by plot separate for want of sufficient area, since threshing and drying of paddy go on simultaneously.

#### WEATHER CONDITIONS.

The year under report has not been a good one for farmers. The distribution has not been good though the average annual rainfall during the year came to 31.82 inches as against 27.63 in the preceding year.

#### ORCHARD AND GARDEN AREA.

A few plants in orchard have commenced to yield and the life of the plants are maintained with pot irrigation and frequent ploughing and other operations given to the area to preserve moisture. Without proper arrangements for an adequate supply of water, it is not possible to keep the plants at their best. Some yields were obtained in peaches loquat and grapes. The area is not enclosed with a fence and it is thus impossible to prevent trespass and damage by theft.

Vegetable crops grown, either suffered from want of rain or from water-logging of the place and the bean crop raised was allowed to seed.

Maize and beans were tried one after another as rainfed crops in the area where cottons stood sometime back. The first crop of maize gave outturn to the value of about Rs. 70 an acre and the bean crop failed for want of timely rains. Water melons failed completely being attacked with disease.

Mulberry plants were pruned and the area has been further extended in the year with the hope that arrangements will be made to rear silk worms.

Sisal hemp bulbils got from Dacca (Bengal) were planted in a portion of the garden area and the plants are healthy.

## SISAL HEMP.

About 5 acres in the Jakkur plantations  $3\frac{1}{2}$  miles away from the farm were brought newly under the plough and the plants got from the Lal-bagh were planted. The crop is healthy. Damage is being caused to plants every now and then by wild pigs and stray cattle. A watchman to look after the plants has been appointed and a number of cattle trespassing in the area were impounded by him.

GUNDAPPA S. KURPAD,  
*Vice-Principal, In charge.*

ANNUAL REPORT OF THE DEPUTY DIRECTOR OF AGRICULTURE  
(EASTERN DIVISION), FOR THE YEAR 1924-25.

1. During the year under report, I was in charge of the following:—

- (1) The District work of the Eastern Division.
- (2) The Nagenahalli Farm.
- (3) The Sri Krishnarajendra Vyavasaya Dharma Patasala.

2. *Staff.*—The permanent staff of Agricultural Inspectors and Fieldmen has remained unchanged. The temporary staff appointed in connection with the Distress Relief Operations was disbanded.

3. The additional Agricultural Inspector who was appointed for the Mysore Range about 2 years ago and who for various reasons could not be posted for work to the District, was put in charge of the newly formed Nagamangala Range towards the end of the year. The Division now has 14 Depots against 13 in the previous year.

4. Of these, six have still not been provided with clerks or peons. This is a great want, as the transactions of the Depots are too large to be satisfactorily attended to by the Agricultural Inspector or his Fieldmen who have to attend to touring work in addition. The inconvenience to the public who are now largely resorting to the Depots is very great, as prompt service could not be accorded. The Depots at Dodballapur and Maddagiri are particularly busy Depots whose sales of Rs. 3,225-5-3 and Rs. 4,132-10-2 made up of innumerable small items have had to be attended to single-handed by the Agricultural Inspector or a Fieldman.

5. *Tours.*—I was on tour for 167 days in the year and the different Agricultural Inspectors for periods as stated below:—

Range	Number of days
Bangalore	88
Dodballapur	211
Channapatna	190
Kolar	220
Chintamani	201
Chikballapur	177
Tumkur	205
Maddagiri	180
Tiptur	165
Mysore	199
Maddur	200
Chamrajnagar	272
Yedatore	163
Nagamangala	34

6. *Leave to Staff.*—The staff of Agricultural Inspectors was on leave for periods shown below:—

Name of Agricultural Inspector	Kind of Leave	Period
Mr. C. V. Ramaiya	Privilege leave	For 1 month from 11th June 1925
„ H. Venkoba Rao	Do	For 12 days from 12th December 1924.
„ B. Abdul Basith Sheriff	Do	For 19 days from 13th May 1925
„ T. D. Chayapathy	Do	For 1 month from 17th May 1925
„ D. Balakrishna Rao	Combined leave	For 6 months from 5th November 1924.
„ P. Ramaswamiengar, Farm Manager, Nagenahalli.	Privilege leave	For 22 days from 4th June 1925
„ K. A. Krishnan	Combined leave	For 1 year from 15th November 1923.

7. *Transfers.*—Mr. D. B. Sivarama Rao, Agricultural Inspector, Kolar, was transferred to Chikmagalur, where unfortunately after a brief illness he died shortly after he joined duty. His untimely death came as a shock. His work during the six years of his service in this division was marked by great zeal and most pains-taking endeavour to push on the work of the department in every direction, and his relation with the public and the officers of the Revenue and other departments in his Range was characterised by much genuine friendliness and cordiality. In him the department has lost a most capable and zealous district officer.

Mr. S. Krishna Rao was transferred to Kolar from Tumkur. Mr. K. A. Krishnan who was Assistant Farm Manager, Nagenahalli, was posted to Tumkur on return from leave.

I attended the District Agricultural Conference at Kolar, Tumkur, Bangalore and Mysore, as well as the Taluk Agricultural Conferences of Anekal, Mulbagal, Sidlaghatta and Chikballapur.

8. *Library.*—Eight more books were added to the Library during the year.

9. *Correspondence.*—The clerical work in respect of correspondence and accounts has increased greatly and as noted in my annual reports year after year, this is taking away a great deal of time which otherwise would have been spent upon my technical work.

The total number of letters received and sent out is as below:—

Letters received	Letters sent out
7,069	5,297

The same state of affairs prevails in the Range Offices also, and especially in the case of the Ranges which have not been provided with clerks.

10. *Season.*—The early *Mungar* rains were very satisfactory throughout the division. In the *Kar* crop area of Mysore, Kar Ragi, Jola and the other early *Mungar* crops were on the whole good, except in the areas on the banks of the rivers in that district which were damaged by the floods. The rainfall for the *Hain* crops in the other districts was also favourable and with the exception of the taluks of Pavagada, Maddagiri and Goribidnur, from normal to good crops may be said to have been harvested in the year. In the three taluks above mentioned, however, owing to a long break after the early rains, dry crops were very poor although there was no difficulty about fodder. Certain parts of Goribidnur continued to be badly hit in the year under report also. Good rains also favoured wet crops on the whole; Kolar, however, depending as it does largely on tank irrigation, did not receive enough; and the same is true of some of the large tanks elsewhere. Taken all in all, however, the year was fairly normal for wet crops also.

11. In the Channel tracts of the Mysore District, the damage due to the floods was vast. On the margin of the rivers, damage was due directly to the floods such as submersion, washing away of nurseries and transplanted crops, erosion, silting up and other permanent injury which would cost raiyats almost as much as the cost of the land to reclaim. Owing, however, to breaches in the channels and head works and the impossibility of repairing them in time, the loss of paddy crop throughout the area was immense. Both landowners and tenants have undergone serious loss in the year.

Some measure of relief was afforded (1) by the supplying of seed paddy of the short duration variety *halubbalu*, in the areas (*vide* Para 44) and (2) by the extension of the irrigation season by nearly two months which was ordered by Government and which rendered the raising of a small four anna crop possible.

12. In the eastern taluks of Tumkur and Kolar, the fodder situation having greatly eased quite early in the year, the Fodder Distress Relief Operations started last year and described in my last year's report in detail were wound up in the month of January and all the Fodder Depots closed.

13. The recovery has, however, not been rapid and relief had to be afforded by the supply of large quantities of seed grains of all kinds, on credit, which was made possible by the prompt sanction of *takavi* loan applications by the Amildars, notably in Maddagiri where the Amildar, Mr. Surappa, B.A., was very keen in promoting this work. *Vide* para 54 for details of seeds supplied.

#### DISTRICT WORK.

14. The somewhat favourable season of the year, barring the exceptions noted in the above paragraph, has enabled the staff to push on the various lines of work on the programme of the department with a larger measure of success. The various items of work are described below under the usual headings.

15. *Inspection of Estates.*—The kind of estates referred to here and the objects for which the assistance of the staff is sought have been fully explained in previous reports. There is a steady increase year by year in the number of such estate owners. It is noteworthy also that many among the educated classes who ordinarily seek other openings than agriculture are taking in increasing numbers to the land. Owners of landed property who have for years let out their land to tenants are taking up the management into their own hands, and several gentlemen are also newly investing in landed property to be formed by themselves direct. The department is being freely resorted to for advice and assistance by this class of people in increasing numbers. Estates to the number of 543 were inspected both by myself and the district staff in the year.

#### IMPLEMENTS.

16. *Ploughs and Cultivators.*—The demonstration of the improved ploughs and other implements has continued as heretofore. A large number of such demonstrations has related to the working of the "Mysore" plough, of which nearly all depots have now been provided with one for demonstration purposes.

The Kolar Mission plough which has been the most popular plough so far, has been kept back to a certain extent as far as departmental effort is concerned and work has been concentrated in the popularising of the "Mysore" plough. Sales of the Kolar Mission plough have, however, been very striking, chiefly owing to the favourable season. The Mysore plough, of which 59 were sold in the year, is much appreciated, chiefly for its special bar feature which reduced the cost of replacement of share very materially. The price of this plough was also reduced to Rs. 25 towards the close of the year and the hire purchase system of sales has also been permitted in regard to it, both with a view to increase its sale rapidly. The effect of these concessions will be felt only in the coming year, as they were sanctioned somewhat late this year.

Tests were also made in regard to wearing quality of the "Mysore" plough made in the Central Industrial Workshop and the Badravati Foundry. It is understood that a very substantial reduction in price is in prospect, which, if it comes about, will certainly help its rapid sale.

The Kolar Mission Six Shovel Cultivators are also being taken in large numbers. A fact worthy of notice in the year is the local manufacture here and there in the division of this implement, which in certain cases possess improved features.

The lighter plough, *viz.*, the Eureka, maintained its popularity in the Yedatore paddy tract.

Of shares and spare parts, all the depots maintained a good supply. In the Bangalore District, it is seldom that raiyats purchase shares from the depot as they all get them made at local blacksmith's forges. Shares of this pattern were arranged to be kept on view in the other depots, so that the model may be copied by blacksmiths elsewhere also, and the need for imported shares may be much reduced.

The popularity of the improved plough in the Bangalore District is certainly very noteworthy, and in many villages there is hardly a single raiyat who does not own such a plough.

17. The number of ploughs and other implements sold in the year is given in the following table:—

Range	K. M. ploughs	Verity ploughs	Eureka ploughs	Mysore ploughs	Meston ploughs	Cultivators	Shares and other spares
Bangalore	165	..	..	23	2	2	129
Dodballapur	..	..	..	1	..	..	3
Channapatna	7	..	15	2	..	14	74
Kolar	10	..	..	10	2	5	36
Chintamani	5	..	..	7	2	3	4
Chikballapur	9	5	..	1	..	2	72
Tumkur	2	..	6	2	..	11	68
Maddagiri	..	1	..	2	..	4	5
Tiptur	6	1	..	..	2	7	30
Mysore	..	..	5	9	..	4	66
Maddur	14	2	4	1	..	14	74
Chamrajnagar	5	1	4	1	..	2	40
Yedatore	..	..	51	..	2	5	73
Total	223	10	85	59	10	73	674

18. *Hiring of Ploughs.*—The ploughs and cultivators kept for hiring out in certain of the depots were fully availed of in the year, and a total of Rs. 127-7-0 realised thereby.

As in former years, the outfits kept for the same purpose by many of the Co-operative Societies were also in use. More societies have also entered into similar work. (*Vide* para 55 for details).

19. *The Disc Harrow.*—This implement has also, as usual, been hired out for varying periods. Its use in preparing land for sugar-cane, discing in cocoanut gardens, etc., has been much appreciated. Mr. V. Krishnappa of Arekere, Tumkur Taluk, who uses it regularly on his land, grew a green manure crop on his ragi lands and disced the crop in as green manure for ragi, with the help of the disc harrow. Its comparatively high cost has so far prevented raiyats from purchasing the implement for themselves. For discing ragi land after harvest and for discing in cocoanut gardens, the implement has been a great favourite. It was used in the following Ranges:—

#### USE OF DISC HARROW.

Bangalore	...	4	For discing dry land for ragi and for preparing sugar-cane land.
Channapatna	...	3	Breaking clods and discing dry lands to make ploughing easy.
Kolar	...	1	Pulverising clods in sugar-cane lands.
Chikballapur	...	3	Ploughing after harvest. Breaking up of clods in sugar-cane fields and preparation of land for the crop.
Tumkur	...	1	Discing the green manure in dry lands and also discing the ragi fields.
Mysore	...	1	Crushing clods for planting sugar-cane and also discing land after harvest of horsegram.
Chamrajnagar	...	...	Crushing clods after ploughing is over.

20. *Seed Drills.*—It was stated last year that a six-tynd seed drill for ragi sowing in wider rows was attempted to be popularised. Except in a few cases in the Mysore Range, it was not possible to do much in this direction. Our State is, however, the home of the seed drill and many excellent patterns are in use in most of the Districts. There is, however, a tendency to resort to the quicker but certainly more slovenly method of broad casting in certain places which it will be necessary to counteract.

21. *Threshing Rollers.*—The work of popularising these carried on for the past several years in the Mysore District has been attended with very good results. This implement has caught on and at many quarries in the district, rollers have begun to be made. Through the depots directly 83 rollers were sold in the district, *viz.*, 75 by the Maddur Range and 8 by the Mysore Range, but it will become unnecessary for the department to directly supply any more hereafter.



22. A rather useful application of the stone threshing roller is in connection with harvesting groundnut. The roller is worked on the groundnut field to be harvested, and the soil is considerably loosened on the top, enabling the working of a plough or a six shovel cultivator behind it to lift the crop. This means a great saving of labour, in a matter which is particularly in need of such relief. This additional use of the roller is being brought to the notice of raiyats everywhere.

23. *Nahan Sugar-cane Mills*.—The mill has maintained its popularity, and in the year under report, 17 have been sold as per details below:—

Bangalore	...	...	...	...	...	4
Kolar	...	...	...	...	...	3
Chikballapur	...	...	...	...	...	3
Tumkur	...	...	...	...	...	1
Mysore	...	...	...	...	...	2
Maddur	...	...	...	...	...	4
					Total	17

24. As stated in my previous reports, I have been endeavouring to induce Rural Co-operative Societies to purchase and keep a mill and a set of pans for the purpose of hiring out to members and non-members. It is an item of agricultural work which will not only increase the popularity of these rural societies in their neighbourhood, but will prove a very profitable investment. In the year under report, I am glad to be able to record that four more societies, *viz.*, Kunigal, Mulbagal, Chikballapur and Sivahalli (near Mandya) responded and invested in such outfits. All of them have earned a substantial amount by way of hire already in this one season.

The demonstration outfits in the various depots were also largely given out for hire, in addition to being demonstrated for short periods. The following statement of hire amount earned shows to what extent they were in use.

Range.						Amount.
Bangalore	..	..	..	..	..	Rs. 30
Channapatna	..	..	..	..	..	7
Chikballapur	..	..	..	..	..	36
Tumkur	..	..	..	..	..	51
Mysore	..	..	..	..	..	34
					Total	158

#### CULTIVATION METHODS.

25. *Seed Selection*.—The selection of seed by the methods of selecting good earheads and the method of selecting seed by the salt water method prior to sowing has been largely explained and as it is one of the simplest operations to carry out, a large number of raiyats in the Ranges are reported to have carried out such selections both by themselves and with the assistance of the staff. On the whole, a total quantity of 16,638 seers of various seed grains have been selected.

26. *Economic Transplantation of Paddy*.—Being one of the recommendations popularised for many years, the practice has been permanently adopted in many large paddy-growing areas. Much continues to be done under the supervision of the staff also and the following areas are reported from the different ranges; but the total of the areas on which the seed rate has been economised in this manner must be very large now without its being possible to be stated definitely. It will be no exaggeration to say that the practice is now followed in every important paddy tract in the division.

27. *Ploughing Dry Land after the Harvest of Ragi*.—This practice also continued to be explained and popularised. There are, however, well-known difficulties in adopting the practice, but wherever possible the practice has been adopted. The six shovel cultivator, the *Dodkunte* of the Bangalore District and the disc harrow have been used for the work.

The large and rapid extension of the cultivation of groundnut throughout the division is, however, automatically bringing about this practice; because the digging of the field necessary for the harvesting of this crop amounts to such ploughing or stirring of the field.

28. *Wider Planting of Sugar-cane.*—This practice has steadily gained ground in the year. From small areas in the principal cane-growing villages especially of the Kolar District, and practised only in the case of the new varieties of cane supplied by the department, it is now being adopted extensively and in the case of the local varieties of cane also. In Chikballapur, Sidlaghatta, Chintamani, Bagepalli and Goribidnur Taluks, the area has extended.

29. *Jaggory-boiling Methods.*—As in the former years, demonstration of jaggory-boiling methods by the use of the Nahan Mill, proper furnace provided with fire bars and chimneys and also using the double pan furnace have been held in all the ranges. The assistance of the staff is frequently called in for this purpose and canes from which trouble was being experienced in jaggory-making have been handled to the satisfaction of the raiyats.

A notable demonstration using a fuel-saving-furnace was held for many days in Arakere village, Mysore District. Others have been held in Sulleri, Lalaghatta and Titmaranahalli villages in the Channapatna Taluk and in Sabbanhalli and Devarayasandra in the Kolar District.

The use of litmus paper, of the skimming ladle and of the brix spindle to test ripeness of cane have also been demonstrated in nearly all the jaggory-boiling houses visited by the staff. Altogether 164 jaggory-boiling houses have been visited for advice, in addition to the demonstrations mentioned above.

#### MANURES.

30. *Cattle Manure.*—As stated in last year's report, the subject of the proper methods of conserving cattle manure by means of properly arranged cattle stalls and manure pits has continued to be explained widely. On many newly built farm houses, the matter has been attended to by raiyats, in respect of properly constructed cattle stalls. In the matter of manure pits, there are great practical difficulties; one at least of these is the want of proper sites; I am glad to be able to report that in a newly formed Village Panchayet, *viz.*, Thippur, Yedatore Taluk, the grant of sites for this purpose has been made conditional upon the construction of properly protected manure pits.

31. The distribution of green manure seed in the channel tracts of Mysore is largely done by private merchants in Mysore; the trade in sunnhemp seed has largely increased of late years owing to the increasing use of this kind of manure in the Yedatore Taluk, where the department has been endeavouring to introduce it and to obtain irrigation facilities for the purpose by way of summer flow in the channels.

The favourable rains elsewhere have also enabled raiyats to sow green manure seeds in cocoanut gardens especially in Tiptur.

The growing of green manure crop for ordinary dry (ragi) land to be ploughed in about a fortnight before the sowing of ragi, which has been a practice recommended by the department but seldom heeded, was begun in the year. Mr. A. S. V. Krishnappa in Arakere village near Tumkur, where he manured four acres in this manner using the disc harrow to cut up and incorporate it with the soil. Similar work was also done in the village of Koregal in the Maddur Range.

The total quantity of green manure seed supplied by the department in the year was 3,869 seers.

32. The matter of growing honge plantation in the channel tracts of the Mysore District, where the difficulty for adequate manuring is chronic, has been brought to the notice of the raiyats there and of the District Board of Mysore. The latter has promised to consider favourably any scheme by which they could encourage such plantations. Mr. Y. Aswathnarayana Rao, Retired Engineer, who is planning many lines of agricultural development in Yedatore, is already arranging to sow four bags of Honge seed for plantation purposes.

33. *Oil Cake.*—The practice in recent years of the department not stocking and supplying oil cake manure direct to raiyats but only assisting them to obtain prompt supplies from dealers themselves, has been continued. Sugar-cane growers

in the Mysore District, where alone this manure was not known and where work had to be concentrated these years, now require no special inducement. Large quantities are bought from the country *ganas* as well as the power press in the Mysore City.

It speaks not a little of the quick response the raiyat is now making to the efforts of the department that the use of oil-cake should be giving place either fully or in part to sulphate of ammonia which at present prices is cheaper than groundnut oil-cake per unit of Nitrogen (*vide* para 35. below).

34. The use of oil-cake for manuring mulberry has increased in the year and in Channapatna and Maddur Ranges, both from the departmental depots and through the co-operative societies at Maddur, eleven tons of oil-cake were issued for the purpose.

The small quantity which the depots themselves had still to handle was 1.74 tons.

35. *Sulphate of Ammonia*.—The increasing use of sulphate of ammonia in the division is a most notable feature. The demand in the year could not at all be adequately met. There was inordinate delay in getting out the supplies and such as arrived was sold out all for cash within a few days after arrival and at the end of the year a large indent sent up still remained to be filled in. The demand which we created only two years ago has gone up with surprising rapidity, and is now spreading into all the sugar-cane tracts of the division. Dodballapur, Gorididnur and Bangalore remained the chief centres for the supply in the year, but in the coming year, it can be safely anticipated that other sale depots will have to supply similar quantities. The quantity sold this year was 26.02 tons as shown below:—

Range					Quantity in tons.
Bangalore	...	...	...	...	4.43
Dodballapur	...	...	...	...	11.00
Channapatna	...	...	...	...	1.00
Kolar	...	...	...	...	1.07
Chintamani	...	...	...	...	0.66
Chikballapur	...	...	...	...	4.43
Tumkur	...	...	...	...	0.09
Tiptur	...	...	...	...	0.13
Mysore	...	...	...	...	1.02
Maddur	...	...	...	...	0.06
Yedatore	...	...	...	...	2.13
					26.02
			Total	...	26.02

And the next year's demand is likely to be about three times as much. The manure is now applied chiefly for sugar-cane, but in view of its cheapness as compared with oil-cake, is now used in its place for other crops as well, such as the various manure mixtures for paddy, potatoes, cocoanuts, etc., and for mulberry.

36. *Superphosphate, Bonemeal, etc.*—The superphosphate manure continued to be supplied principally through dealers direct. Quantities up to about 200 tons have been reported to have been supplied chiefly for manuring paddy in the Hoskote Taluk. Through the departmental depots, a large quantity of the special paddy manure mixture now being supplied for some years, was sold in this year also. In the Mysore District, *i.e.*, the channel tracts, the popularity is steadily increasing and it will be soon possible that sales increase to such an extent as to justify handing it all over direct to the dealers.

37. The District Board of Kolar sanctioned a sum of Rs. 150 to meet part of the cost of paddy manure sold in that district, so as to cheapen the manure to that extent by way of encouragement in the initial stages.

The Taluk Board of Anekal likewise sanctioned a sum of Rs. 50 for a similar purpose for the raiyats in that taluk.

38. The total quantity supplied through the depots in the year is as detailed below :—

Range	Quantity in tons.
Bangalore	9'50
Dodballapur	1'60
Channapatna	0'03
Kolar	1'33
Chintamani	0'82
Chikballapur	0'50
Tumkur	1'21
Maddagiri	0'06
Tiptur	0'56
Mysore	10'18
Chamrajnagar	3'75
Yedatore	1'33
Total	30'87

39. Of manure mixture for cocoanuts, potato, fruit trees, etc., 3,031 lbs. were sold in the year.

The rapid extension in the use of these manures is the most gratifying and noticeable feature of the work of agricultural development in the division in recent years.

40. The Chilian Nitrate Propaganda Organisation supplied about 3 cwts. of nitrate of soda free for trial as a top dressing for potatoes. Trials were made at Whitefield, Gangenhalli and at Mannekolal, and the remarkable improvement in the stand of the crops has been striking. Results regarding actual yields were not to hand and will be furnished in the coming year's report.

#### CROPS.

41. *Sugar-cane.*—Work on sugar-cane other than what has already been referred to under manures, sugar-cane milling, jaggory-boiling, etc., has related to the supply of seed setts of the variety H. M. 544 in a larger number of centres. The supply has been principally from private growers themselves, but from the Government farms at Babbur, Nagenhalli and Hebbal also much seed has been sent out. The year may be said to have been good on the whole for sugar-cane and the yield from this particular variety has been everywhere very striking. Some of the yields reported are given below :—

	Mds. per acre.
Channapatna	384
Kappalnadagu (Kolar Range)	325
Devarayasandra (Kolar Range)	297
Chintamani	295
Kirangur (Seringapatam Taluk)	400
Bannur—T.-Narsipur Taluk	550

The cultivation of this variety has now extended far and wide in the division. In the year under report, notable new areas have been put down in several villages in the Bagepalli Taluk which are famous for their sugar-cane cultivation, and also in Devarayasandra, Malur, villages in the Chintamani Taluk, Koratagere, Yedatore, Arakere, Seringapatam, Palhalli and French Rocks. In Bannur itself which was one of the first centres where the variety was introduced, the present area may amount to 50 acres, and nearly one lakh of setts were distributed from this village.

Remarkably heavy crops were grown in nearly every one of these areas. With the solitary and notable exception of Kunigal, the variety is now grown in practically every important sugar-cane growing tract or village in the division.

42. The growth of the crop was so luxuriant in certain situations that maturity was delayed and as the canes could not be kept on for want of irrigation water, milling had to be done though the canes were not ripe. This was the case in respect of two remarkably heavy crops, one at Thippur (near Yedatore) and the other at Kengeri (Bangalore Taluk).

In the Yedatore tract, Mr. Aswathanarayana Rao has put down a nursery of this variety preparatory to growing it on a large block installing the necessary power machinery for crushing.

The number of setts distributed by the staff in the different Ranges is as below :—

Range	Setts distributed.
Dodballapur ... ..	12,500
Kolar ... ..	27,500
Chintamani ... ..	54,000
Mysore ... ..	1,10,000
Yedatore ... ..	8,000
Total ... ..	<u>2,12,000</u>

43. *Paddy*.—The distribution of seed paddy in the year under report was firstly, in the course of the normal distribution of short season or other select varieties, and secondly, in connection with the Flood Relief Work in the Channel tracts of Mysore. In regard to the former, the Nagenhalli Farm has, as usual, been largely responsible for a large quantity of the special varieties supplied. These varieties have been Nagpur fine, Banku, Chintamani sanna, and the Coimbatore selections got out from Coimbatore Breeding Station and referred to in the last year's report as having attracted much attention on the Farm as a high yielder. In addition to these, from the Hebbal Farm, Alur sanna paddy, which did well on that Farm during the year, has been distributed also to a certain extent in all the ranges. The demand for departmental assistance is generally only for obtaining the short season paddies and in order to meet this demand, several short season varieties are on trial on the Nagenahalli Farm including one 80 days' paddy from the Madras Agricultural Department. As a matter of fact, the Nagenahalli Farm is being increasingly made use of for the trial and multiplication of such seed.

44. The supply of seed paddy in connection with the Flood Relief Work was all *halubbalu* seed got out from the Marikanive tract. As, on account of the damage by floods, much re-sowing had to be done and as about two months of the irrigation season was already over, this particular variety which was also about the only one which could be had in any large quantity at that time, was got out. The supply was made through the agency of the Flood Relief Committees and the paddy was also ordered to be sold at concession rate. The total quantity of seed supplied in this manner was 462.96 pallas, the realisation being Rs. 4,890-4-5. To a large degree, however, raiyats could not derive the benefit of this measure, because irrigation channels and head works could not be repaired in time and the supply of water was too precarious to ensure anything but a very small, about a four anna crop.

45. The quantity of seed paddy supplied in the year is as per details below :—

Range.	Quantity.
	Srs.
Bangalore .. ..	1,943
Dodballapur ... ..	101½
Channapatna ... ..	1,395½
Kolar ... ..	4,945
Chintamani ... ..	2,876
Tumkur ... ..	325
Maddagiri ... ..	2,190
Mysore ... ..	15,436¾
Maddur ... ..	1,917¾
Yedatore ... ..	600
Chamrajnagar ... ..	34,460
Total ... ..	<u>66,190½</u>

The distribution of the Coimbatore No. 1 paddy was notable, as not only the produce of the Farm but also that from raiyats who had grown it round the Farm from last year's Farm Seed was all distributed for seed purposes, the demand being so great. The variety yielded on the latter areas up to 22 pallas an acre, which for a Kartik (rainy season) crop is very high.

46. *Hebbal 22 Ragi*.—The distribution of this strain is now principally required only to keep a steady flow of pure seed into the districts; seed for that purpose is derived from the Hebbal Farm, and from the produce of selected growers whose fields constitute really "Seed Farms" for this ragi. The supply of bulk seed

has been left to the raiyats themselves. The seed ragi supply from the depots amounted to 394.35 pallas. The greatest preference for this strain is confined to the districts of Bangalore, Kolar and Tumkur, where, as already reported in previous reports, many villages grow this strain now to the exclusion of the older local strains. Crops in the year under report were also very favourable, the Tiptur Range being notable in this respect.

The area under this strain cannot be reported correctly, but 50,000 acres will not be wide of the mark as an estimate.

47. *Other Strains of Ragi*.—As the demand in certain parts of Bangalore and Mysore is for a variety which will mature somewhat earlier, a number of strains of this character from the Hebbal Farm were given out for trial in several villages of this district, but the results do not show that they mature materially earlier than the Hebbal 22.

Hebbal 40, a *hullu-bile* selection is somewhat favoured in certain parts of Bangalore and 5.76 pallas of this strain were distributed. As in its outward characteristic there is nothing to distinguish this strain from the strains usually grown, it is impossible to find out to what extent this has been cultivated.

48. *Kar Ragi*.—As reported in last year's report, several varieties were put out for trial in properly laid out trial plots in the estates of three clients in the Hunsur and Nanjangud Taluks. Only in one of these places, *viz.*, Debur near Nanjangud was the season favourable and comparative results could be obtained. Out of the different varieties, selections of individual plants were carried out, and these have been put out in the current Kar season in the same place for comparative tests.

*Ragi for Flood-Damaged Areas*.—In addition to these supplies, for the dry land areas damaged by the floods in the Heggaddevankote Taluk which had to be re-sown, 5,631 seers of seed ragi were supplied, and these were also ordered by Government to be sold at concession rates through the Relief Committees. A sum of Rs. 622-4-0 was realised from the sale of these seeds.

49. *Jola*.—The seed jola supplied in the year was in connection with the Distress Relief Operations in Maddagiri and Pavagada and Goribidnur Taluks, and again in connection with the Flood Relief Work in Heggaddevankote. In the latter tract in addition to the 50 pallas of ragi mentioned above, 7.70 pallas of seed jola were also supplied at the request of the Amildar.

As regards Distress Relief referred to in Maddagiri, etc., the seed jola was intended to meet the demand for a quick growing food and fodder crop for sowing in the early mungar. One thousand four hundred and sixty seers were supplied and in all the areas where the seed was sown very heavy crops of fodder were obtained; the grain yield was, however, only moderate owing to a long break of dry weather at the time the seed was setting.

50. *Groundnuts*.—The cultivation of groundnuts has been extending so rapidly, that it is probably the most notable feature of crop husbandry during the last few years in this division. As a money crop with a ready market it appeals to the raiyat everywhere. In the districts other than Mysore, the main season late maturing varieties are the general varieties grown. In Mysore, however, where Kar crops are grown and are often followed by a late season crop on the same land, the short season varieties have found the most favour. In the Mysore and Nanjangud Taluks, there are nearly 3,000 or 4,000 acres of the short season varieties grown now, and all this large area is the result of the half a palla or so of the seed which was supplied some six years ago to one of our clients in Nanjangud. In the current season, extensive areas have already been sown and almost harvested in time to sow hain ragi. On the early sown jola fields which have also been harvested already, this groundnut is being extensively in the stubble. As against the usual crop of horse gram which is taken as a second crop on these areas, the groundnut or hain ragi is beyond all comparison in the matter of yield or money return.

51. Reference was made in the last year's report to the growing of this groundnut variety as a catch crop in the paddy land in the channel tract. Here too from a small beginning of only 8 acres in that year, it has extended to 200 acres in the year under report. These crops were inspected by me in company with many raiyats with a view to give it publicity and the standing crops were excellent.

Yields are reported to average 12 pallas an acre valued at about Rs. 80 per acre, which is a very substantial addition to the income from the single crop of paddy to which people were accustomed. During the year, small areas were also being put down in the paddy lands in Maddur and at Yedatore. There is no doubt that probably 1,000 acres, if not more, will come under the crop in the coming season. There is also no difficulty for obtaining seed as huge quantities come in to the Mysore market and there is no need for the department to undertake the supply of the seed. The quantities supplied by the depots both in this district and elsewhere amounted to 200'06 pallas.

52. *Sun-flower Seed and Silage.*—Through the efforts of the Deputy Commissioner, Tumkur, Mr. Md. Zahiruddin Mecci, a beginning was made in the making of sun-flower silage by certain raiyats in the district. One thousand three hundred and thirty-four pounds were distributed in the district, but crops enough for silage making were raised only by a few. On three estates good silage was made in that district, *viz.*, the Wesleyan Mission Orphanage, the village of Aralipur near Bellavi and Chelenahalli, Maddagiri Taluk. These have served as good demonstration as the silage was of good quality and readily eaten by cattle. It was attempted to make silage from the semi-green straw of irrigated ragi in certain villages of Maddagiri, but this was not a success chiefly, I think, due to the fact that there was not enough material to fill a silo of even a small size.

Two pallas were also supplied to the Kolar District, and only one client, *viz.*, Mr. Muniswami Gowda of Anur made a good business of it using a mixture of sun-flower plants and green jola. Silage of good quality and on a large scale continued to be made this year also by Mr. A. T. Mac Issac of Gangenahalli. The work is, however, being continued and about 600 seers of seed have been supplied to these districts in the current season.

53. *Potatoes.*—From the produce on the Gangenahalli Estate, 63'05 mds. of British Queen potatoes were distributed in small quantities. A certain amount of the seed of this variety has also been raised by other growers especially in Malur. In Gangenahalli itself, owing to the difficulty of getting sufficient irrigation water it was not possible to plant anything more than a small area; it is however hoped that the places where the distribution has taken place so far will serve as additional seed centres.

54. *Seed Supply in Maddagiri and Paragada.*—Special mention has to be made of this work during the year. Owing to the complete failure of crops in the season prior to the one under report, there was a very large demand for seeds of ordinary seed grains and groundnut, and the department had to undertake the supply. The quantities were very large for the small depot like the one at Maddagiri. The details are given below :—

Name	Quantity
Sannahatti	3½ mds.
Paddy	2,190 seers.
Ragi	3,682 seers
Jola	1,460 "
Groundnut	16,212 "
Horsegram	8,796 "
Navane	299 "
Avare	87½ "
Togare	33 "
Cambodia cotton	5 mds.
Sun-flower seed	1,334 lbs.

Contrary to the practice of the department, all the seed had to be issued for credit and the manner in which this was arranged with the help of the takavi loan allotment sanctioned by Government for administration by the Revenue Department as usual certainly deserves special mention. Seed was issued by the Agricultural Inspector for amounts of takavi loans sanctioned by the Amildar, the amount being credited to the department. The chief feature is that hardly any time elapsed between the presenting of the loan application, its sanction by the Amildar and the issue of the seed; the special arrangement by which this prompt service was rendered possible deserves to be noted, because the takavi loan system is one of the chief means by which can be afforded the much needed credit and only the delay consequent upon the various formalities prescribed prevents the

system from being taken advantage of. If the method adopted at Maddagiri can be copied elsewhere, it will be possible to render prompt assistance on such occasions.

55. *Work in conjunction with Co-operative Societies.*—A very large number of Co-operative Societies have as heretofore actively taken part in agricultural work by the keeping of improved implements for sale, hire and by the stocking of seeds and manure for sale.

A list is given separately of such societies with the kind of work carried out by them. Special mention should be made of the societies which have undertaken work on a large scale in the year under report. These are:—

*Maddur Co-operative Society.*—The Society has bought the marginal implements, etc., for sale to members, and of manure and seed of the total value of Rs. 500.

3 Cultivators.	
1 K. M. Plough.	
6 K. M. Shares.	
2 K. M. Slip point shares.	
5 Tons and 16½ mds. of	
Groundnut oil-cake.	

(2) *Kunigal Co-operative Society.*—Has purchased jaggory boiling outfit consisting of mill, pans, mould and cooling trough of the value of Rs. 400 in addition to H. 22 ragi, ploughs and superphosphate valued Rs. 100.

(3) *Mulbagal Co-operative Society.*—Has purchased Nahan sugar-cane mill in addition to seeds and manures.

(4) *Chikballapur Co-operative Society.*—Purchased a Nahan Mill for being hired out.

(5) *Attibele Co-operative Society.*—H. 22 ragi, ammonium sulphate and implements for sale.

56. *Cane-milling Co-operative Societies.*—A new society at Muduvathi, Kolar District, reported to be in the course of formation in my last year's report was actually started in the year and a sugar-cane mill and jaggory boiling outfit supplied.

I am sure that this sort of work will put more life into many a rural society, and I am sparing no pains to interest as many as possible in this and similar agricultural work.

57. On the recommendation of the Agricultural Board, a scheme was sanctioned by the Government by which societies which are keen about taking up this work, but are hindered by want of funds, can be assisted by the grant of a loan for this special purpose. The sanction, however, arrived only towards the close of the year and it has not been found possible to take advantage of it in the year under report. It is, however, a much needed help and I am sure we shall be able to avail ourselves fully of it in the course of the current year.

58. *Fodder Distress Campaign.*—This campaign was brought to a close in the year under report, and the Central Fodder Depots at Bangalore and Goribidnur were wound up finally in January 1925. The total sales during the whole of the period that they worked amounted to Rs. 31,609-10-2.

Name of Co-operative Society.	Work done.
Bangalore Range—	
1. Varthur	} Ammonium sulphate, seeds, manures and implements.
2. Vasanthapur	
3. Chikbanavar	
4. Ramohalli	
5. Bagalgunte	
6. Medihalli	
7. Bukkasagar	
8. Attibele	
9. Sarjapur	
10. Sakalavara	
11. Oblapura	
12. Mahadevapur	
13. Arsinakunte	
14. Thyamagondlu	
15. Jakkanahalli	
16. Begur	
17. Kalawomanahalli	
18. Manne	



Name of Co-operative Society.	Work done
<b>Channapatna Range—</b>	
19. Begur .. ..	Sale of H. 22 ragi.
20. Magadi .. ..	Sale of H. 22 ragi and paddy.
21. Tavarekere .. ..	Sale of H. 22 ragi.
22. Closepet .. ..	Sale of H. 22 ragi, hiring out of Nahan Mill and cultivator.
23. Archakarahalli ... ..	Sale of H. 22 ragi.
24. Settihalli .. ..	Do
25. Harohalli .. ..	Do and hiring out of Nahan Sugar-cane Mill.
26. Dayara .. ..	Do do
<b>Dodballapur Range—</b>	
27. Avati ... ..	} Hiring out of K. M. and Meston ploughs.
28. Dodballapur .. ..	
29. Nagadenhalli .. ..	
30. Hadonahalli .. ..	
31. Rajaghatta .. ..	
<b>Kolar Range—</b>	
32. Mulbagal .. ..	Sale of H. 22 ragi, K. M. Plough shares and ammonium sulphate.
33. Mudiyanur ... ..	Sale of H. 22 ragi and plough shares.
34. Devarayasamudra .. ..	Sale of jola, ammonium sulphate and sugar-cane setts.
35. Sundarapalya .. ..	Hiring out of sugar-cane mill; sale of H. 22 ragi, ammonium sulphate and plough shares.
36. Bowringpet .. ..	Sale of H. 22 ragi.
37. Malur .. ..	Sale of H. 22 ragi, ammonium sulphate and potato mixture.
38. Kallur .. ..	Sale of H. 22 ragi.
39. Srinivaspur .. ..	Sale of H. 22 ragi and ammonium sulphate.
40. Sugatur .. ..	Do do
41. Nernahalli .. ..	Sale of ammonium sulphate.
42. Mudavatti .. ..	Hiring out sugarcane mill and pans.
<b>Chikballapur Range--</b>	
43. Varalakonda .. ..	Sale of H. 22 ragi.
44. Sabbanhalli .. ..	Sale of ammonium sulphate, H. 22 ragi and K M. Shares.
45. Manchenahalli .. ..	Sale of ammonium sulphate and <i>banku</i> paddy.
46. Chikballapur .. ..	} Sale of seeds, manures and implements.
47. Gadare .. ..	
48. Vedalveni .. ..	
49. Hosur .. ..	
50. Hudugur .. ..	
51. Posettihalli ... ..	
<b>Chintamani Range—</b>	
52. Chintamani .. ..	} Sale of implements, seeds and manures.
53. Basettihalli .. ..	
<b>Tumkur Range—</b>	
54. Annenahalli .. ..	Hiring out of ploughs and cultivators and sale of H. 22 ragi.
55. Sampige .. ..	Do
56. Herur .. ..	Hiring out of ploughs.
57. Amrutur .. ..	Sale of H. 22 ragi, superphosphate, and co-coanut mixture, vegetable seeds and plough shares.
58. Dandinasivara .. ..	Sale of H. 22 ragi.
59. Kunigal .. ..	Sale of jola, H. 22 ragi and plough.
<b>Tiptur Range—</b>	
60. Mayasandra .. ..	} Sale of implements, seeds, manures, cocoanut mixture, sannhemp and vegetable seeds.
61. Mavinkere .. ..	
62. Kanatur .. ..	
63. Nonavinkere .. ..	
64. Honnavalli .. ..	
65. Turuvekere .. ..	
66. Sira Vartaka Sangha .. ..	

Name of Co-operative Society.	Work done.
Maddagiri Range—	
67. Midigesi .. ..	Sale of jola, ragi, groundnuts and implements.
68. Chandragiri .. ..	Sale of superphosphate.
69. Badavanahalli .. ..	Do
70. Kodigenahalli .. ..	Sale of H. 22 ragi.
71. Kadagathur .. ..	Sale of implements.
72. Bidarekere .. ..	Hiring out and sale of ploughs and cultivators.
Mysore Range—	
73. Bannur Ismailia ... ..	Sale of ammonium sulphate, H. 22 ragi and plough shares.
74. Yelewal ... ..	Hiring out of ploughs.
Maddur Range—	
75. Maddur ... ..	Do
Chamrajnagar Range—	
76. Nanjangud ... ..	Sale of ploughs and cultivators, ploughs parts and seed padāy.
77. Yelandur ... ..	Sale of H. 22 ragi and <i>banku</i> paddy.
78. Gundlupet ... ..	Sale of ploughs.
79. Saragur Panchama... ..	Sale of ploughs and plough parts.
Yedatore Range—	
80. Periyapatna .. ..	} Stocking implements for hire and sale of <i>banku</i> paddy.
81. Hunsur .. ..	
82. Hanasoge ... ..	
83. Saligrama ... ..	
84. Bettadapura ... ..	

59. *Subvention by District and Taluk Boards.*—As already mentioned in para 37, the District Board of Kolar and the Taluk Board of Anekal granted Rs. 150 and Rs. 50, respectively, to enable the department to sell paddy manure at a concession rate.

The District Board of Mysore, sanctioned two scholarships of the value Rs. 12 per mensem for a period of one year to the students of the Mysore District to undergo training in the Sri Krishnarajendra Vyavasaya Dharma Pathasala for the year 1925-26.

Further help by the Mysore District Board is also under contemplation such as help to encourage the planting of honge plantations, supply of green manure, seeds and artificial manures.

The District Board of Tumkur has proposed to meet part of the cost of the sun-flower seed supplied in the district.

60. The Village Panchayet of Thippur village has opened a manure, seed and implement depot and invested a sum of Rs. 400 in these articles. This is part of a general scheme of enlisting all Village Panchayets in starting work according to their individual needs which was adopted by the Yedatore Taluk Board some years ago at my suggestion. It is hoped that the example of Thippur Panchayet will be copied by others in the taluk and elsewhere.

61. *District and Taluk Conferences.*—As usual, in conjunction with the various District Conferences, an Agricultural Conference was also organised. In addition to a Conference, Exhibitions and Shows were also organised; at which demonstrations were held. Mysore organised a fairly elaborate exhibition, Kolar held a Sheep Show, and Tumkur also organised a small exhibition. I attended all these conferences.

The taluk conferences were all attended by the Agricultural Inspectors and those at Nandi, Sidlaghatta, Anekal and Mulbagal were also attended by me.

The staff as usual, has taken advantage of Jamabandi gatherings, santhes, meetings of co-operative societies, Taluk and District Board Meetings to explain and popularise the work of the department.

62. The revenue officers of the districts have been kept informed of and they are in touch with the progress of the work in the districts.

The staff has received active help and co-operation from the Revenue Officers, and Non-Official Presidents and Vice-Presidents of the District and Taluk Boards, and I tender them all my grateful thanks.

63. *Depots.*—The Depots of the Agricultural Inspectors have continued to be popular. The sales (other than fodder transaction) have increased considerably and are shown below in detail :—

Range.	Amount.		
	Rs.	a.	p.
Bangalore	10,888	2	3
Dodballapur	3,225	5	3
Channapatna	1,757	5	6
Kolar	3,350	13	4
Chintamani	933	3	9
Chikballapur	4,823	12	9
Tumkur	1,624	10	2
Maddagiri	4,132	10	2
Tiptur	852	10	2
Mysore	3,555	5	5
Yedatore	1,582	7	3
Maddur	3,038	12	1
Chamrajnagar	4,963	11	0
Total	44,728	13	1

64. I take this opportunity also of commending the work of the District Staff of Agricultural Inspectors and of strongly urging the improvement of their pay and status. Judged alike by the important position they hold in the work of the department and by the pay which officers doing similar work are being paid in the Madras and Bombay Departments of Agriculture, their present pay is decidedly low and a substantial enhancement is called for.

A. K. YEGNANARAYANA AIYAR,  
Deputy Director.

#### ANNUAL REPORT OF THE WORKING OF THE NAGENHALLI FARM FOR THE YEAR 1924-25.

*Staff.*—Mr. P. Ramaswamy Iyengar as usual continued to be in charge of the Farm as Farm Manager throughout the year. During this year also there were changes of the Farm Assistants as well as the clerk. Mr. N. Ramanna, B.A.G., of the Poona College, reported himself for duty in this Farm in the month of April 1924 and left the Farm on transfer in the middle of March 1925. Since then there has been no assistant.

*Season.*—The total rainfall of the year under report is 27.2 inches whereas the rainfall for the last year was 16.95 inches. Although this is a normal average quantity, it was not seasonal and so some of the dry crops such as, horsegram did not fare well. The distribution of the rainfall during the year under report was as shown below :—

	1924-25	1923-24
July 1924	3.02	2.74
August	5.06	1.19
September	5.61	0.91
October	1.31	0.91
November	2.85	2.23
December	0.80	...
January 1925	...	...
February	...	...
March	...	0.34
April	3.90	1.75
May	4.28	5.07
June	0.42	1.81
Total	27.25	16.95

As some improvements to the head sluice in the Krishnarajasagara Water Works had to be done, it was notified that no summer supply would be given to the Farm for growing sugar-cane, and on this score the Farm had to grow only a very small area under sugar-cane just to maintain the foreign varieties of canes to be used for planting in 1925-26; and this small area had to be irrigated by means of an engine and pump installed on the bank of the Devarayanala wherefrom water was pumped up and the canes thus irrigated.

*Buildings and Roads.*—No new roads nor buildings were constructed during the year under report for want of funds, and consequently both the Inspector and the clerk are put to much inconvenience and hardship for want of suitable accommodation. The coolie sheds likewise are in a very unsatisfactory condition. The need for proper quarters is one of the urgent needs of the Farm; the present state of affairs is telling on the health of all the hands of the Farm and there is always a good number on the sick list, which affects the work on the Farm seriously.

*Area under Cultivation.*—The total area under cultivation both dry and wet during the year under report is 44 acres and 20 guntas. Sugar-cane and paddy on the wet area and only ragi on the dry area were the principle crops grown as described below:—

(a) *Dry Crop*—1. *Ragi.*—Some five varieties of good strains of seed ragi got from Hebbal were tested with H. 22 ragi, the yields per acre of these varieties are noted in statement below:—

No.	Variety	Average yield per acre in seers
1	H. 22 ragi	450
2	Local ragi	442
3	H. 40 ragi	333½
4	H. 43 ragi	311
5	H. 71 ragi	411
6	H. 73 ragi	388
7	H. 77 ragi	396

Though growth in the early stage was very good, owing to want of sufficient rain towards the end, the yields were low. The tests were all repeated thrice, as usual.

(b) *Wet crops—Paddy.*—The area under paddy during the year under report was 39 acres and 24 guntas as against 30 acres in the previous year. The total yield is 388 pallas as against 322 pallas in the previous year. The average yield worked at 9.8 pallas per acre for the whole Farm.

The following are the bulk varieties grown on the Farm. The extent and the yield per acre are noted in the statement given below:—

No.	Variety	Area	Yield per acre in seers
1	Banku	6 Ac. 20 guntas	1,200
2	Kaddi	9 " "	1,033
3	Sakalati	5 " 20 "	917
4	Nagapur fine	2 " 10 "	394
5	Puttasamanahalli sanna	2 " 10 "	852
6	Halubbalu	2 " 10 "	677
7	Kembuti	9 " 10 "	921
8	Natnahallisanna	1 " 20 "	985
9	Coimbatore No. 1	" 20 "	1,378
10	Coimbatore 24 B.H.	" 14 "	1,517
11	Bangarthige	" 10 "	992
12	Alur sanna	" 10 "	1,044

Besides these, some varieties got from the districts were also tried along with these varieties in small plots. This experiment was repeated twice and their results are noted down in the Statement overleaf. This trial was repeated again to study the characteristics of the different varieties.

## Yield of District Varieties.

No.	Variety	Yield per acre	
		Grain	Straw
		Seers.	lbs.
1	Halubbalu	749	3,307
2	Bangarathige	772	3,152
3	Banku	902	3,151
4	Sakalathi sanna	1,130	4,365
5	Natnahalli sanna	1,299	5,438
6	Black scented paddy	1,092	2,500
7	Yedatore kembuti	850	3,198
8	Chintamani sanna	747	2,600
9	Pattasomanahalli sanna	976	3,557
10	Kaddy	771	2,521
11	Alur sanna	1,044	2,549
12	Nagapur fine	1,315	3,356
13	Coimbatore 24 B.H.	1,435	2,784
14	Coimbatore No. 1	1,514	4,536

The following experiments were conducted.

(1) *The Application of Paddy Mixture in different Doses.*—This was designed in order to answer the question what dose of the paddy mixture would be the most profitable. The results are noted in the statement given below:—

## Experiment with Paddy Mixture.

*(Kembuti Paddy.)*

No.	Nature of experiment	Yield per acre	
		Grain	Straw
		seers	lbs.
1	Check (No manure)	894	3,425
2	360 lbs. paddy mixture	1,246	4,615
3	720 lbs. do	1,269	4,494
4	1,080 lbs. do	1,411	5,203

The increase due to the single dose of paddy mixture costing Rs. 20 per acre was 352 seers of paddy and 1,190 lbs. of straw worth Rs. 38 showing a net profit of Rs. 18 per acre.

The increase due to heavy dose was 517 seers paddy and 1,778 lbs. straw costing Rs. 65 showing a net profit of only Rs. 5.

(2) *The Application of Superphosphate in varying Doses.*—This was with a view to answer the question whether and what dose of superphosphate alone would be profitable. The results are tabulated below:—

## Experiment with Superphosphate.

*Pattasomanahalli Sanna.*

No.	Nature of experiment	Yield per acre		Remarks
		Grain	Straw	
		Seers.	lbs.	
1	Check	906	3,547	
2	Superphosphate 160 lbs.	1,171	3,494	
3	do 320 lbs.	1,042	3,093	Sannhemp ploughed
4	do 480 lbs.	1,031	3,486	in.

The superphosphate on these soils without the addition of nitrogenous fertilizers does not appear to be profitable.

(3) *Testing the comparative Manurial Value of 'Lantana' as Green Manure against 'Sunnhemp' and Wild Indigo.*—This was designed to find out if lantana is any use at all as a green manure. Results are given below:—

No.	Nature of experiment	Yield per acre		Remarks
		Grain	Straw	
1	No manure .. .. .	Seers. 867	lbs. 2,961	
2	Lantana .. .. .	1,004	3,715	
3	Sunnhemp .. .. .	1,173	3,893	
4	Wild indigo .. .. .	1,169	4,284	

(4) *The Application of Paddy Mixture at varying Periods.*—This was with a view to find out and if and what difference is made by varying the time of application of the manure. Results are given below:—

*Time of Application of Paddy Mixture.*

No.	Nature of experiment	Yield per acre		Remarks
		Grain	Straw	
1	Manured a week before transplanting ..	Seers. 1,104	lbs. 2,856	
2	Manured at time of transplanting ..	1,008	2,712	
3	Manured when yellow colour of the seedlings turns green.	926	2,537	

As in the previous year, the best time to apply the manure appears to be a week before the transplanting time.

(5) *Single Band Tunch Ransplanting.*—With four varieties of paddy such as banku, Natnahalli sanna, kembuti and kaddy, the above test was conducted and their results are noted in the statement below:—

Single seedlings against bunch seedlings transplantation.

No.	Variety	Single : Yield per acre		Bunches : Yield per acre	
		Grain	Straw	Grain	Straw
1	Banku .. .. .	1,042	2,139	1,086	2,437
2	Natnahalli sanna .. .. .	938	2,313	975	2,551
3	Kaddi .. .. .	1,211	3,231	1,409	3,936
4	Kembuti .. .. .	1,620	3,594	1,656	4,215

The transplanting in absolutely singles does not appear to be advantageous on the Farm soils, the experiment will be changed in the coming year, the planting being in 2's as against bunch planting.

(6) The value of the new manure "Ammophos" of the grade 20-20.

No.	—	Yield per acre	
		Grain	Straw
1	Check .. .. .	Seers 1,043	lbs. 3,360
2	Ammophos (100 lbs. per acre) .. .. .	1,380	4,226

The dose applied is 100 lbs. per acre. It is seen from the statement that the application of Ammosphos has resulted in a decided increase both in grain and straw. It was also observed that a week after the application of the manure, there was a very good contrast between the check plot and that of ammosphos, the latter showed signs of good tillering growth and colour.

(7) The use of basic super as against ordinary supers with oil-cake mixed.

No.		Yield per acre	
		Grain	Straw
1	No manure	Seers 826	lbs. 3,633
2	Supers and oil-cake and sunnhemp as green manure...	1,047	4,840
3	Basic super and oil-cake and sunnhemp as green manure.	953	4,480

This experiment for the first time was conducted to compare the manurial value of basic supers and ordinary supers with no manure as check plot. It will be seen from the statement that ordinary supers with oil-cake has given better yields both in grain and straw.

(8) *Application of paddy mixture.*—Varying the proportion of Nitrogen to Phosphoric acid.

No.		Yield per acre	
		Grain	Straw
1	Paddy mixture consisting of 200 lbs. cake and 160 lbs. supers.	Seers 3,097	lbs. 4,600
2	Mixture of 200 lbs. cake and 320 lbs. supers ...	1,187	3,574
3	Mixture of 400 lbs. cake and 160 lbs. supers ...	1,193	3,826
4	Mixture of 400 lbs. cake and 320 lbs. supers ...	1,214	3,626

It is observed from the statement that the application of mixture of 200 lbs. cake and 160 lbs. supers has given the highest yield.

Further trials on these proportions will be conducted and more definite results will be awaited from the next year's crop.

#### SUGAR-CANE.

As already explained above, for non-supply of water to the Farm during summer, only 1 acre and 26 guntas were grown under sugar-cane of different varieties of foreign canes just to maintain the seed for the next year's crop. No experiment of any kind was taken up during this year. The crop suffered very much on many occasions on account of the engine and pump not working satisfactorily.

Fifteen thousand one hundred and fifty sugar-cane setts of H.M. 544, H.M. 312, H. M. 602 and other Hebbal varieties, were sold to the raiyats of the Seringapatam and T.-Narsipur Taluks. The amount realized was Rs. 215 besides using Rs. 75 worth of seeds for planting in the Farm. All the rejected canes after selling and using for the Farm were milled by the Nahan Mill side by side with the Chattanooga Mill. Forty-one maunds of jaggory was produced and Rs. 128 was realised by the sale of jaggory, and thus on 1.26 acres, Rs. 419 was the total yield.

#### DISTRIBUTION OF SEED.

Seed paddy to the extent of 1,128 seers of the value of Rs. 137 was distributed to the raiyats round the Farm, and sugar-cane 15,150 setts of the value of Rs. 215 was also likewise distributed.

The following statement gives the receipts and expenditure on the Farm for the year:—

Financial Results of the Nagenhalli Farm for 1924-25.

No.	Receipts	Amount	No.	Expenditure	Amount
	Value of Farm produce of all kinds—	Rs.		Recurring charges—	Rs.
1	Paddy including straw ...	3,762	1	Labour ...	2,964
2	Sugar-cane ...	991	2	Live-stock ..	493
3	Ragi including straw ...	25	3	Seeds and manure ...	364
4	Castor ...	2	4	Implements ..	147
5	Farm yard and city manure ...	267	5	Contingency ..	706
6	Miscellaneous ...	3			
					4,674
			1	Non-recurring charges --	
				Building ...	1,748
	Total ...	5,050			1,748
				Total ...	6,422

A. K. YEGNANARAYANA AIYAR,  
*Deputy Director.*

ANNUAL REPORT OF THE SRI KRISHNARAJENDRA VYAVASAYA DHARMA PATASALA,  
CHIKKANAHALLI, FOR THE YEAR 1924-25.

Mr. A. Venkataramiah continued to be in charge of the School as Head Master during the year.

The number on rolls of students during the year was 15. The number of applicants who underwent the Entrance Examination was, however, the largest on record as there were 52 of them; these had come from all over the State.

The attendance and health of the students were satisfactory. The Sub-Assistant Surgeon at Sira continued his weekly visits to the school to render medical aid.

The prescribed syllabus of studies, both theory and practice of Agriculture was gone through. The Veterinary Inspector at Maddagiri took some of the classes in Veterinary Science.

In addition to the usual practical work on the School Farm, students were given training in (a) Basket making, (2) Rope making, (3) Leather stitching, (4) dismantling of and the fitting up of farm implements and machinery.

In the school room, the students reared out several insect pest specimens, such as castor, semi-looper, cotton stem borer, the red cotton bug, the cotton leaf-roller, cotton boll worm, and the sugar-cane borer.

The preparation and use of several insecticides and spray fluids was demonstrated to the students. One "Holder" pressure sprayer was purchased for the school in the year. This will do away with the need for borrowing one from the nearest depot when wanted and will enable the students to have one for use always both for study and for use on the Farm.

A laying of eggs of the Mysore silk worms was got from the Sericultural Popular School at Kunigal and the worms were reared. Out of this rearing, a few cocoons were used for seed and a second rearing of the silk worms was done.

As the school farm afforded no scope to give the students training in the boiling of arecanut and turmeric, they were taken to the neighbouring gardens and were given practice therein.

As usual, the students were taken on week end tours to the neighbouring villages, where they got opportunities to collect several herbarium specimens for the



school museum, to study the different breeds of and the prevailing common diseases of cattle, and also to castrate several animals.

They were also taken on an excursion to the Babbur Farm at the expense of the Government. Realizing the utility of these excursions, the students expressed their desire to visit the important agricultural places at Bangalore at their own expense. Accordingly, they were taken to the Hebbal Farm, Sunkal Farm (Lal-Bagh), Departmental Laboratory and the Imperial Animal Husbandry Institute.

The students maintained a good flower garden in front of the school and also a kitchen garden in the school wet land.

As usual, the students helped the raiyats of the neighbouring villages in the fitting up of the Nahan Mill.

The Debating Society was fairly active and the students took lively interest in games.

The students and the staff maintained a Reading Room. The following newspapers and the journal are being supplied to it:—

One Vrithantha Patrike, 2 Vokkaligara Patrike, 3 Sadhvi, 4 Arthasadhaka Patrike, 5 The Times of India Illustrated Weekly, 6 The Journal of the Mysore Agricultural and Experimental Union.

The students' Union Stores managed by the students themselves continued to work during the year.

Sugar-cane, tobacco, irrigated ragi, paddy, onions, garlic, maize, mulberry, chillies, cotton and fodder, jola, were grown in the school wet land. Besides, the students' observation plots were laid out in the school garden. Sugar-cane occupied only a small patch of land on the Farm and did not give good yield.

The following experiments were conducted for educative and experimental purposes:—

(1) Varietal tests with Red Mauritius, H. M. 320, 544, 553, J. 33 A, Rasathali, Pattapatti and Hebbal seedling canes.

(2) Varietal trial of irrigated ragis, *viz.*, K. 1 and Hulimavu.

(3) Manurial trial with irrigated ragi with cattle manure and cattle manure and special manure.

On the dry land, fodder, jola, horse-gram, different varieties of ragis, groundnut and castor were grown.

The activities of the Implement Depot were confined to the sale of a few spare parts of ploughs and the Nahan Mill.

Appropriate seasonal demonstrations and lectures were held, as usual, at the Santhe in the School Premises.

The Annual Examination was conducted by the Deputy Director of Agriculture, and the students' performance was much commended. All the 15 students passed the examination and were declared eligible for certificates.

In the early part of the year, the Annual School Day was celebrated, with Mr. Zahiruddin Mecci, B.A., Deputy Commissioner of Tumkur in the Chair, a large number of leading raiyats being present. The school is increasing in popularity. The equipment is very inadequate in several directions. Even the carpentry and smithy classes which had to be discontinued two years ago have not been restored. The expansion of the school and its better equipment deserve early consideration.

A. K. YEGNANARAYAN AIYAR,

*Deputy Director.*

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#### REPORT OF THE WESTERN DIVISION FOR THE YEAR 1924-25.

As in previous ten years, I was in charge of the division without any kind of leave.

I was on tour for 137 days during the year and had to shorten my iteneration as I had to cut my coat according to the cloth I had. The farm was transferred to the general budget and the extra I used to get from the Supari Cess for my tours

to it, was suddenly excised and I was told about this after half of the year had passed by. I was besides asked to conduct the examination of the Hebbal School.

The correspondence also increased enormously having had 9,732 inlets and 9,817 exits. This further tied me down to my desk at Shimoga.

The changes in the personnel have been many this year. Mr. Nagappiah went on long leave at first, and though, soon recalled to duty was lent to the Economic Survey Officer. In his place N. Srinivasamurthy stepped.

A new malnad range constituting Koppa and Thirthahalli was opened and one Mr. M. B. Ranganatha Rao was posted in charge of it. At the end, Holalkere and Hosdurga were clubbed into a new range and put under K. Ramachandra Iyer.

Mr. Bennur was transferred to Bangalore and replaced by Mr. D. B. Sivarama Rao who was soon snatched away by the cruel hand of death. Since that sad moment, there is only one man for the whole district and work has consequently got somewhat dislocated.

Mr. Daniell took leave for four long months and a new recruit K. Rama Iyer has come in on the Marthur Farm.

*Leave.*—Mr. Daniell of the Marthur Farm was on four months' leave, and Mr. Nagappiah who went out for six months', was recalled 20 days before the expiry of his period. He was then drafted on to the Economic Survey Office. Mr. Gopal Rao of Tarikere had in his turn a month's respite.

*Seasonal Conditions.*—The pre-monsoon showers behaved just the same way as last year by being conspicuously absent. The June and July rains poured insidiously and unceasingly, bringing the flood levels in rivers even beyond the records of the previous year. The damage done to crops and property was even more severe. But there was this redeeming difference that the north-east rains of September and October were more abundant and equable. In fact, the fall continued late in December affording a chance to the late sown dry crops to put in an optimum growth.

*General.*—The great bulk of our work has again been transacted through private negotiation. Firms like Messers. Mahalaxmi & Co., Purushottam and Murthy, Brahmappa have—dealt directly with private individuals on our recommendation. The large depot of the first named company has given a great scope for the unrestrained introduction of manures and the increase of their sales.

The aid that the District Boards gave was invaluable. The co-operative societies have given their quota of helping hand though in an humble manner. I shall refer to both of these further on in greater detail.

*Implements and their demonstrations.*—The Kirloskar plough has attracted the appreciation of all black soil cultivators who in one voice demand only the turn-wrest arrangement, and will not look at any other. Thus 217 ploughs of this kind were sold out of our doors while at least an equal number was dealt with by private shopkeepers. Seeing that there was such a roaring demand, several firms in the Bombay Presidency have tried their hands at manufacturing them and glutted the same into the Davangere market. More than 300 Bahadur ploughs that arrived at Davangere in a private shop at the fag end of the season are lying there. Owing to this competition, the prices have been at a low ebb and the raiyat is being benefitted by it. Kirloskars are the best out of the lot and they now lead the market.

The bulk of the above 217 (*viz.*, 178) was taken by the Chitaldrug District, while a few, *i.e.*, 22 and 17 got into the black soil areas of Shimoga and Kadur Districts respectively.

More than 2,000 heavy ploughs are in the Davangere Range and here the big wooden black soil plough has almost gone out of use and is likely to be soon thrown into oblivion.

Owing to the vigorous propaganda of the Inspectors, 50 Verity Ploughs were also disposed of. Though, this is superior to the Kirloskar in its material, it is decidedly lighter and does not possess the turn-wrest arrangement. It does not thus stand chance of successful introduction, though more than 400 of it are now in use.

Of the lighter ploughs, 27 Mysore, 55 Kolar Mission, 25 Eureka, 33 Meston and one old bar plough were sold. As the Mysore is a bit heavier, the people are still after the Kolar Mission. The advantages in the former outweigh this defect, if only it is made a little lighter and I believe the Mysore plough will soon be the ideal model of the raiyats' implement.

The sales of implements in the malnad have been low because as I have repeatedly submitted, the raiyats there want a small turn-wrest plough the manufacture of which is still on the anvil. All told, we have distributed 378 ploughs.

Of spare parts which are mostly shares, 2,380 went out of our depots, while 2,800 were sold by private people bringing the total to 5,180.

We have sold 13 six shovel cultivators. In areas of doddakunte this implement is almost at a discount and in the malnad it is declared to be too heavy. Anyhow cultivators of 3 and 4 tynes may come into vogue sooner or later.

Stone roller is in general use in the maidan of Chitaldrug and Shimoga. The Hassan is slowly imbibing the idea. It is now being slowly tried for threshing paddy and Mr. Devangi Ramanna Gowda, our warm co-operator has manufactured them in his own quarry and supplied one dozen to his brother cultivators. A successful demonstration of its use in paddy threshing was also made at Koppa.

*Sugarcane Mills.*—There was as usual a big demand for Nahan Sugar Cane Mills, and we could only supply six of them as that was the number I could get for my share. Eight Kirloskar mills were also sold and are giving satisfaction. One of the old type broke its shaft purely on account of negligence by the owner. The rest seem to be all right. The lion's share of the demand for mills was met by the Industrial Department who have recently put into market a very efficient type of a mill.

#### SEEDS.

*Sugar-cane.*—Much of our energy has been spent in introducing improved varieties of cane. Inter-distributing is being encouraged and the department is only directing the raiyats where good seed is available. Where the raiyat himself cannot bring or negotiate for himself, the Inspectors have done it for him. Generally the growers of improved varieties set fabulous values on their seed and will not climb down. The ordinary raiyat will not think of paying such heavy prices in the first instance. There is thus a great obstruction in the way of the free introduction of the improvement. In the Hassan District, the District Board came to our aid in this connection. They at once sanctioned Rs. 250 for the work and we were with this money able to supply more than 30,000 sets of 544 all the way from Sakrepatna. We put them into the hands of the raiyat at cheap local rates and the freight and the difference in price was made up by the above subvention granted by the District Board. Both 544 and J. 33 a, have been thus distributed in good cane centres in the Hassan District, so that there may be a fair chance for their further spread.

Coming to various varieties, red-mauritius is still the cane of the malnad, occupying nearly 1,500 acres. It is being slowly replaced by Java. Java again covers more than 1,200 acres and is found most in the Hassan District where it is replacing the eighteen months' varieties that exist there. It is also popular in the Kadur District and in some portions of Shimoga. Its non-tillering habit and its arrowing quality are in its way and probably the free use of a forcing manure like ammonium sulphate will probably cure both of these evils. Experiments have been set on foot in the Halebid area where the results have been encouraging so far.

Strenuous attempts are being made to push on 544, the renowned seedling cane of Hebbal. Nearly 100 acres are under it now. It takes harm from the wet of the malnad and matures a bit later. It is thus ill-adapted to the Hassan District where they are tired of long season types.

553. seems to be somewhat promising and is being tried both on the Marthur Farm and on private lands near Sagar. It is a white rinded cane and is not afraid of flood or heavy rains. Five hundred of its sets have been given out for trial. How it will pit against other varieties can only be known in the fullness of time.

J. 33a is another variety that we want to replace cheni with. About 25,000 sets were taken to this area and the crop is now growing. It is in every way superior to cheni and will very likely compete successfully with it and even oust it.

All told we have distributed 4,77,163 sets through our depots as follows:—

				Rs.
H. M. 544	...	...	...	2,21,100
Java	...	...	...	1,81,251
J. 33a	..	...	...	25,000
Red Mauritius	...	...	...	48,000
H. M. 544	...	...	...	500
H. M. 312	...	...	...	1,312
				4,77,163

*Groundnut.*—This is one of the popular crops that has crowned our humble efforts with success. The advent of short season types has given great opportunities for its unbounded expansion. From a few bags that I got in 1914, spanish peanut has now extended to more than 35,000 acres and has even filtered to the adjacent Bombay and Madras territories. It is most abundant in the Davanagere Range and has also found its way to Channagiri and Honnali Taluks of Shimoga, where it covers nearly 2,000 acres. It has travelled again further south and has spread more than 3,000 acres in the Kadur and Tarikere Taluks. A small area is also found in Arsikere.

As it is a short season crop engaging the land only less than four months, it allows of a second crop being raised on the self same soil and in the self same season. It is thus a complete asset to the raiyat and has probably added 35 lakhs to his resources. Several clever methods of cultivation have also been devised by the raiyats at the instance of the department. Before groundnut is fully ripe and is lifted off the land, horse gram is sown in between the lines. By this wise move, the cultivators are able to catch time by the forelock and mature a good crop of horsegram.

They further put in groundnut along with castor which having a longer lease of life—will have a fair opportunity to develop itself after the nut is harvested.

It is again planted in between the lines of Doddahatti which in its turn will be benefitted immensely by the nitrogen added on to the soil by the legume. After the harvest of groundnut, there will be time enough for the cotton to put forth its growth.

I understand that nearly 3 lakhs worth of seed was taken from the Davanagere market this year. Unfortunately a good portion of it was bad. With the aid of the money that was lent to us by the District Board of Kadur, we were able to buy and stock about 100 pallas of it—which was taken to places where it was not hitherto known.

*Ragi.*—H. 22 has been spreading in the Tarikere, Kadur Taluks of Kadur District; Arsikere and Chennarayapatna Taluks of Hassan District; Davanagere and Hosdurga Taluks of Chitaldrug District. It now probably occupies nearly 8,000 acres. Attempts are being made through the help of our esteemed co-operator Mr. Ramachandra Vasudeva Rao of Baggavalli to have whole villages sown with it, so that unadulterated seed may be available for distribution. We sold 7,706 seers of it from our depots.

*M. M. 1 Ragi.*—The scope for the introduction of this ragi was set at nought by the heavy rains of malnad for two successive years. As a matter of fact, people never even thought of a dry crop. Still it was grown successfully here and there and we have distributed about 567 seers of it. It has extended to more than 50 acres.

*Nat Ragi.*—The short season type of Nat Ragi which we introduced some time ago is gaining ground and has been extending. It has received a set back as the nalas have got into disorder and summer supply is not regularly given. We anyhow distributed 257 seers of it this year.

*Cotton.*—Strenuous efforts were made to distribute selection 69 in the black soil area where it has now extended to 1,500 acres. The fields found pure were specially selected and the cotton was ginned separately under departmental supervision. Unfortunately as we had no wherewithal to buy the whole cotton and have

the seed collection under our co-~~taken~~ <sup>collected</sup> ~~etc.~~ <sup>to</sup> ~~col.~~, some of it was indiscriminately mixed with inferior local cotton. ~~y,~~ <sup>and</sup> ~~any~~ <sup>ho</sup> ~~seed~~ <sup>seed</sup> enough for 10,000 acres has been stored in departmental depots ~~and~~ <sup>with</sup> ~~the~~ <sup>the</sup> growers. I expect that if rains fall opportunely that area will be dev~~oted~~ <sup>oted</sup> to ~~one~~ <sup>the</sup> crop in 1925.

Our thanks are due to the District Board of Chitaldrug who lent us Rs. 1,000 for the purchase of this seed. ~~The~~ <sup>The</sup> bulk of our stock comes from this money. We distributed in 1924, 4,890 lbs. ~~selection~~ <sup>selection</sup> 69 from the depots of the department.

Of the hirsutum types, M.A. ~~II~~ <sup>II</sup> was distributed in some quantity (*i.e.*, 129 lbs.) and a few acres were grown successfully both in the Davanagere and Arsikere Taluks. A larger quantity of its seed has been collected and distributed in 1925.

One thousand pounds of Gadag No. 1 and 514 lbs. of Cambodia were also distributed.

Small quantities of Dharwar American selections and the superior M.A. IV given out for trial have also done well. M.A. IV seems to have drawn the attention of every body, but as it is yet under experiment with the Botanical section, it has not emerged out of the precincts of the scientific section for general distribution.

*Paddy.*—Of the varieties of paddy, halubbalu was distributed the most in the flood stricken area to the extent of 45,435 seers. It is a delicate variety and required to be carefully handled. Banku is hardier and does infinitely better in the malnad. It has won its way both in the rainless and rainy zones. It is even tried as an experiment as upland paddy by some enterprising cultivators. It has extended to more than 150 acres in all. Chintamani sanna a product of Hebbal is also extending in halubbalu areas and in the Hassan District. Its preferment consists in its not shedding when ripe as is done by the above other two short season types. This is also sown dry by some enterprising growers of Davanagere. The other varieties that we distributed are Nagpur fine, Alur Sanna, and Coimbatore. The quantities distributed of all types are as follows:—

				Seers.
Halubbalu	...	...	...	45,435
Banku	...	...	...	3,355
Chintamani sanna	...	...	...	2,173
Nagpur fine	...	...	...	70½
Alur Sanna	...	...	...	120
Coimbatore	...	...	...	65

*Economic transplantation.*—As usual several thousand acres are being economically transplanted in the malnad of Thirthahalli and Koppa.

*Sunn-Hemp.*—The department has been trying to introduce the practice of growing this for green manure in the nala areas of Arakalgud and Holenarasipur and under the Vanivilasapur Reservoir. The cultivators have eagerly adopted it and nearly 2,000 acres are under it in Ramanathapur and Hole-Narasipur taluks. In the Vanivilasapur area, it has extended to 300 acres. Its further spread here was arrested on account of its susceptibility to the attack of caterpillars. This year we sold only 4,826 seers of it and could not fully satiate the demand. We could not stock more as it was found too costly to buy at the dear market of Rani-bennur and transport it all the way to Ramanathapur. The loan of the Hassan District Board was helpful in buying this seed.

*Maize.*—This crop has risen to some prominence in the Chikmagalur Taluk where probably 50 acres are under it. Seed is got in some quantity from the Gokak Farm where it is available in bulk at a cheap rate. This year 100 seers were distributed.

The other seeds that were given out were as follows:—

Sunflower	...	...	...	20 lbs.
Garlic	...	...	...	12½ "
Korkapali	...	...	...	15 "
Cowpa	...	...	...	9 seers.
Gunia grass	...	...	...	1,000 suckers.
M. F. Chillies	...	...	...	12 ozs.
Turmeric	...	...	...	2 maunds.

*Manures.*—There has been an awakening for the use of artificial manures and a huge demand has consequently arisen for all kinds of manures. The depot opened by Mahalaxmi Mills at Chikmagalur has contributed a good deal to meet this. Of

nitrogenous manures the following quantities of referent oil cakes have been sold through the department.

	Tons.	Maunds.
Groundnut	87	19
Kurdie	89	40
Castor	18	40
Hongey	20	24
<b>Total</b>	<b>215</b>	<b>43</b>

A much larger quantity has been bought by people themselves. In the Marikanivi area, more than 200 tons have been imported from Sira and Tumkur. Dealers bring it to the very doors of cultivators and sell most of it on credit. At least 10 tons of our supply has also been used for feeding cattle which take it on eagerly and thrive exceedingly well on it. Groundnut cake is the only concentrate that is used on the Marthur Farm for work bullocks and has been found, proteid for proteid, more economical than gram. The Malnad People are now most eagerly after it.

Ammonium sulphate has also slowly crept in and 15½ tons which means Rs. 5,500 in money value—has been taken up mostly by the cane growers. The Hassan and Kadur Districts have specially appreciated its value. The Halebid cane growers have applied it in various doses from 8 to 24 maunds to the acre. As the crop that got the highest dose was exceptionally bad before its application, it has not told effect so well there. Anyhow the use of the manure has induced profuse tillering even in the non-tillering Java and I recently counted more than 23 and 24 shoots in a clump. How it will fare in the yield of jaggory has to be watched with interest. The coffee planters have also begun to use it.

Of phosphatic manures, supers is being taken up by the raiyats specially for cane. Its beneficial effect on this crop on the Marthur Farm has been conclusively proved. It has been used for sugarcane, paddy and various other crops in the Vanivilasapur area. The coffee planters use it and bone meal to fertilize their crop. On the whole, we have given out:—

Supers	8 tons.	68 mds.
Bonemeal	55	33

*Miscellaneous.*—Vegetable seeds of sorts to the value of Rs. 254-2-0 were distributed, the purchase thereof being made from the amount of Rs. 50 given to us by each of the four District Boards.

Six silo pits were filled and six lantana compost pits were formed. The demonstrations were conducted at 12 places for preparing prickly pear for cattle feed.

Two areca driers were built and 196 copper sulphate packets were given out.

*Demonstrations.*—The number of our various demonstrations stand as follows:—

Ploughing	235
Cultivators	18
Jaggory boiling	57
Economic transplantation	23
Roller threshing	2

*Work Through Co-operative Societies.*—The appended statement shows the money promised by the various societies for Agricultural work, though a large number have yet to begin work. Special mention has to be made of the following societies which are actively co-operating with the department.

*Arsikere.*—Has sold articles worth more than Rs. 500 and has set apart Rs. 500 for Agricultural work. It has distributed H. 22 ragi, Spanish groundnut, K.M. ploughs, shares and K.M. cultivators. The distribution to the whole taluk is being done by the society.

*Kannayakanahalli.*—Set apart Rs. 200. Taken up more than a ton of ammonium sulphate.

*Halebid.*—Set apart Rs. 200. Taken up more than a ton of ammonium sulphate, half a ton of oil cake, ploughs, etc.

*Belur.*—Set apart Rs. 500. Taken up manures, paddy and ploughs 5 Meston ploughs, 36½ seers of Banku paddy, and 121 seers of Chintamani sanna, and 40 maunds of groundnut cake.

*Gattadahalli.*—One Mysore plough and one plough chain.

*Kadur.*—Set apart Rs. 100.

All its manures have been sold. It has stocked some ploughs also.

*Mudgere.*—Set apart Rs. 100. Has taken up all our depot work and attends to the distribution of things required by the whole taluk.

*Mugaivalli.*—Has taken 5 Eureka ploughs and 7 shares.

*Alur.*—Has taken 7 shares.

*Birur.*—Has taken 2 cultivators.

*Ajjampur.*—One Kirloskar No. 100 plough.

*Bajjavalli.*—Bilijola 97 seers; 120 seers of H. 22 ragi, M. A. II cotton 100 lbs. Kurdie cake 14 maunds.

*Lakkavalli.*—One Eureka and 3 Meston shares and two Eureka points.

*Hireguntanur.*—One Verity plough.

*Vanivilasapur.*—One palla of sunnhemp, 8 maunds of ammonium sulphate.

#### HELP RENDERED BY DISTRICT BOARDS.

*Hassan.*—Of all District Boards, Hassan have co-operated with us the most. They gave us Rs. 1,000 first, out of which we bought 50 pallas of sunnhemp which was forthwith consumed that year. Another Rs. 200 out of it was used for the demonstration plot at Hole-Narasipur. The magnificent Java cane that rose in that plot attracted the favourable eye of every passer-by. Up rose a roaring demand for the seed and the whole cane was cut from top to toe for that purpose. The sets were all sold at concession rates. The fruit of this our action can be gauged by the fact that the variety has now extended to full one thousand acres.

The Board gave us 100 rupees for the purchase of demonstration implements which we are using in our every day work. Half of the cudas of our sales belongs to the Board for their generosity in this connection.

They further gave us a man to run a small demonstration plot in the Municipal Office compound near Hassan. Here also the superiority of improved cane and the use of fertilisers on cane were most successfully demonstrated. These canes were also distributed for seeds.

The original thousand rupees was then returned; we got another loan of Rs. 2,000 which we freely used. We bought 150 pallas of sunnhemp which we distributed in the nala areas of Ramanathapur, Hole-Narasipur and Srinivasapur. To places where this growing of green manure was unknown, we took this torch of knowledge and as a result we find today that more than 2,000 acres are having the improvement. A great craving for the seed has arisen which we are not able to satisfy. The seed has to be imported from the far off adjacent Bombay and Madras territories. It has to be bought there in a dear market where men from Rajamahendri come and bargain for it. The cost of seed and its transport charges swell up the price at the other end and though superior in quality, the seed will not be attracted by the raiyat who will demur to pay the high value put upon it. We have thus to sell it at a loss. We therefore stopped our supply in 1925, though there was a clamour for it. The cultivators have been induced to raise sunnhemp locally and though at present it is somewhat insufficient, a day will soon arrive when it will be self-sufficient.

The Board also gave us Rs. 40 for experiments to combat the growth of touch-me-not. The trials are on their way. We have since brought to Saklespur the grass called *panicum punctatum* which has killed the noxious touch-me-not at Balehonnur.

Through their countenance we were able to buy and distribute 1,670 seers of H. 22 ragi, 831 seers of Chintamani sanna, 1,259 seers of Banku paddy, 53 tons of groundnut cake, 3 tons of ammonium sulphate and 6 tons of bone meal. I have since returned Rs. 1,300 and hold only Rs. 700 of theirs.

They have further given us Rs. 50 for the purchase and sale of vegetable seeds of which quantities worth Rs. 25 have been sold till the end of June.

We have to acknowledge another generosity of theirs which prompted them to grant a sum of Rs. 250 for helping the distribution of cane. The growers of improved canes, as I said, stuck fast to their guns and demanded high prices for their seed, which fact was likely to give a blow to the further introduction of these improved strains. The Board came to our rescue at this momentous time. With their money we were able to buy 544 cane at higher price at Sakrepatna and transport it all the way to Hassan and still sell the same at local rates, at the final destination. The difference was evidently met by the grant. J. 33a was also bought locally. About 40,000 sets of 544 and 10,000 sets of J. 33a were thus distributed and that in regular cane centres. The far reaching effect of our labour will only be known in the fullness of time and if the performance of J. 33a realises our expectation, a day may not be far off when 4,000 acres will be under it, commemorating the name of the Board that first gave it a start.

*Kadur District.*—This Board has generously given us a loan of Rs. 2,000 which we have been using for the purchase of manure and seeds. Last year we got 100 pallas of groundnut from it at a cost of Rs. 1,000. We paid for the ammonium sulphate of which we distributed nearly 4 tons in this district. Out of this money we also bought 15 pallas of H. 22 ragi, 1 palla of M. M. 1 ragi, 4 pallas of Halubalu paddy and 7 pallas of Barku paddy.

The large quantity of groundnut, Kurdie cake and Superphosphate was also distributed with its help.

They have further given us an advance of Rs. 50 for the purchase of vegetable seed, with the help of which quantity worth Rs. 85 was sold during the year.

*Chitaldrug District.*—This Board has kindly granted Rs. 1,000 at a psychological moment for the purchase of cotton seed. 600 maunds of selection 69 have been purchased and kept ready of distribution.

They have besides given us an advance of Rs. 50 for the purchase of vegetable seed.

*Shimoga District.*—The Shimoga Board gave us a loan of Rs. 750. Of this they allowed us to use Rs. 50 for meeting transport charges on improved strains of paddy and Rs. 81-8-0 for printing leaflets on the preparation of lanțana manure. The balance is being used for the purchase of manures and seeds.

From this money we were able to meet the cost of 7 pallas of Barku paddy, 11,000 sets of H. M. 544 cane and 12,000 sets of Java cane and 4 pallas of M. M. 1 ragi. Through its help we were able to distribute 10 tons of oil cake, 3 tons of ammonium sulphate. The Board have also given us an advance of Rs. 50 for the purchase of vegetable seeds with the help of which, seeds worth Rs. 133 were distributed.

D. G. RAMACHANDRA RAO,

Assistant Director.



List of societies that have agreed to take up agricultural co-operation work  
in the Shimoga Division during the year 1924-25.

Sl. No.	Name of Society	Amount set apart	Remrks
<b>SHIMOGA DISTRICT</b>		Rs. a. p.	
1	Shikarpur Co-operative Society	200 0 0	
2	Shiralkoppa do	50 0 0	
3	Sorab Hanuman do	100 0 0	
4	Hurali do	50 0 0	
5	Ulavi do	50 0 0	
6	Moody do	100 0 0	
7	Channagiri Krishna Kalabhyudaya Co-operative Society	200 0 0	
8	Anavatty Co-operative Society	100 0 0	
9	Kelady do	350 0 0	
10	Gajanur do	125 0 0	
11	Malur do	50 0 0	
12	Kallurkatte do	200 0 0	
13	Nagar do	100 0 0	
14	Hulikal do	50 0 0	
15	Udagani do	100 0 0	
Total		1,825 0 0	
<b>KADUR DISTRICT</b>			
1	Kadur Co-operative Society	100 0 0	
2	Birur do	200 0 0	
3	Davanur do	200 0 0	
4	Sakrepatna do	100 0 0	
5	Aldur (Chik) do	80 0 0	
6	Mugalavalli do	200 0 0	
7	Lingadahalli (Tarikere) Co-operative Society	50 0 0	
8	Lakkavalli do	100 0 0	
9	Kattemane (Koppa) do	200 0 0	
10	Narasimharajapur do	25 0 0	
11	Sinse do	50 0 0	
12	Balehonnur do	100 0 0	
13	Mudugere do	100 0 0	
14	Halaudur (Koppa) do	50 9 0	
15	Kigga do	50 0 0	
16	Sringere do	250 0 0	
17	Koratikeri (Tarikere) do	100 0 0	
18	Bylenahalli do	100 0 0	
19	Aradevalli (Chik) do	20 0 0	
20	Vastara do	25 0 0	
21	Malur do	25 0 0	
Total		2,125 0 0	
<b>HASSAN DISTRICT</b>			
1	Belur Co-operative Society	500 0 0	
2	Halebid Hoisala do	250 0 0	
3	Banavar do	100 0 0	
4	Arasikere do	500 0 0	
5	Sravanabelgola do	100 0 0	
6	Hiresave do	100 0 0	
7	Santesivara do	100 0 0	
Total		1,650 0 0	

## WESTERN DIVISION, SHIMOGA.

## FIGURES OF WORK DONE DURING 1924-25.

No.	Particulars	Total work done	Districtwar details			
			Shimoga	Kadur	Hassan	Chitaldrug.
I. IMPLEMENTS.						
1	Meston ploughs ..	33	21	3	9	..
2	Mysore ..	27	12	6	6	3
3	Kirloskar ..	217	22	17	..	178
4	Eureka ..	25	3	15	6	1
5	Verity ..	50	..	8	..	42
6	K. M. Ploughs ..	25	16	..	9	..
7	Bar Plough ..	1	..	..	..	1
8	Stone roller ..	13	13	..	..	..
9	Cultivators ..	13	5	4	4	..
10	Sugar-cane mills Nahan Kirloskar ..	6 8	6 3	..	..	.. 5
11	Gardening tools ..	9	..	9	..	..
12	Spare parts of all kinds of implements.	5,180	262	141	65	4,712
II. SEEDS.						
1	Haluballu paddy...	45,435 srs.	12,053	21,863	11,031	488
2	Coimbatore ..	65 "	19	..	46	..
3	Banku ..	3,355 "	882	1,198	1,259	16
4	Alur Sanna ..	120 "	..	..	120	..
5	Nagapur paddy ..	700 "	..	..	700	..
6	Chintamani sanna ..	2,178 "	183	1,114	881	..
7	H. (22) ragi ..	7,706 "	8	6,023	1,670	5
8	M. M. 1 ragi ..	567 "	..	567	..	..
9	Nati ragi ..	257 "	192	..	65	..
10	Sunnhemp ..	4,826 "	409	594	1,231	2,592
11	Groundnut ..	252 mds.	57	177	18	..
12	Sun-flower ..	20 lbs.	20 lbs.	..	..	..
13	Garlic ..	12½ "	12½ "	..	..	..
14	Maize ..	100 srs.	28½	71½	..	..
15	Karkapille seeds ..	15 lbs.	15 lbs.	..	..	..
16	M. F. Chillies ..	12 ozs.	4	4	4	..
17	Cowpea ..	9 srs.	9	..	..	..
18	Gunia grass ..	1,000 suck- ers.	1,000 suckers.	..	..	..
19	Sugar-cane setts. H. M. 544 ..	221,100	55,850	84,550	80,700	..
	H. M. 553 ..	500	500	..	..	..
	H. M. 312 ..	1,312	1,312	..	..	..
	Java ..	181,251	20,251	81,000	80,000	..
	J. 33a. ..	25,000	..	..	25,000	..
	R. M. canes ..	48,000	..	48,000	..	..
20	Cotton Seeds M. A. II seeds ..	129 lbs.	129	..	..	..
	Cambodia ..	514 "	514	..	..	..
	Gadag 1 ..	1,000 "	25	750	..	225
	Sel. 69 seeds ..	4,890 "	520	4,370	..	..
21	Turmeric ..	2 mds.	2 mds.	..	..	..
III. MANURES.						
		T. Mds.	T. Mds.	T. Mds.	T. Mds.	T. Mds.
1	Groundnut cake ..	87 19	17 65	15 67	53 47	.. ..
2	Kardi cake ..	89 40	1 33	88 0	.. ..	0 7
3	Castor cake ..	18 40	.. ..	18 40	.. ..	.. ..
4	Honge cake ..	20 24	.. ..	18 67	.. ..	1 37
5	Supers ..	8 68	5 41	1 72	0 43	0 72
6	Ammonium sulphate ..	15 40	2 31	9 77	3 2	0 10
7	Bonemeal ..	55 33	0 10	48 71	6 16	0 16

## WESTERN DIVISION, SHIMOGA—concl'd.

No.	Particulars	Total work done	Districtwar details			
			Shimoga	Kadur	Hassan	Chitaldrug
<b>IV. DEMONSTRATIONS</b>						
1	Ploughing ... ..	235	36	97	79	23
2	Cultivating .. ..	18	10	4	4	..
3	Jaggory boiling .. ..	57	14	16	16	11
4	Economic transplantation .. ..	23	..	..	23	..
5	Roller threshing ... ..	2	..	2	..	..
6	Prickly pear ... ..	12	..	..	..	12
<b>V. MISCELLANEOUS.</b>						
1	Silo pits ... ..	6	3	3	..	..
2	Lantans compost pits .. ..	6	..	2	4	..
3	Areca driers .. ..	2	..	..	..	..
4	Copper sulphate packets .. ..	196	..	21	..	175
5	Vegetable seeds worth .. ..	Rs. a. p. 254 2 0	Rs. a. p. 133 15 3	Rs. a. p. 85 15 0	Rs. a. p. 23 15 9	Rs. a. p. 10 4 0
6	Total sale proceeds of manures seeds actually sent to the treasury.	39,589 8 1	7,724 5 7	5,753 10 7	12,496 1 5	13,615 6 6

## REPORT OF THE MARTHUR FARM FOR 1924-25.

*Seasonal Conditions.*—The year 1924, opened with a long rainless spell that continued almost upto June. The monsoon then began in right earnest once for all, bringing the total fall to over 21 inches in June alone. This permitted no time or opportunity for agricultural operations which suffered a good deal. Though the total precipitation was not as big as that of last year, it ran upto 127.84 and thus amounted to much more than the average which was 95. The later rains were better this time and afforded some facilities for the development of dry crops that were sown in the season. Sugar-cane specially suffered from the excessive wet and paddy also shared the same fate as both of these were repeatedly flooded during the monsoon.

*Sugar-cane.*—This crop was damaged the most by the heavy rainfall and its yields have consequently been undesirably low. Last year's experiments were all continued and a few more were added. They have all yielded very interesting results.

*Spacing.*—As could be expected from a non-tillering variety like Java, two feet spacing between the lines of cane has done the best, giving 33,872 lbs. as against 20,544 lbs. and 18,857 from distances of 3' and 3½ feet respectively. This narrower spacing has the great disadvantage of not allowing sufficient room or earth for ridging the cane without which the crop will seriously suffer from water logging in the malnad. Thus the only salvation is to find a variety that will tiller profusely and at the same time resist the moist climate. We cannot either force tillering by the use of heavy doses of nitrogenous manures which if applied at planting time will kill the eye buds and produce faulty germination. There are thus wheels within wheels and the problem is thus beset with so many difficulties which future experiments of many years can alone solve.

*Green Manure Experiments.*—The growing of green manure is only feasible where there is plenty of water for irrigation. The green manure requires the moistening of the interspace between cane, and again its rotting in the soil after it is cut requires copious flooding.

In the experiments on the farm (Statement III) one of the plots with green manure and supers was not watered enough and produced very low yields which came to 11,784 lbs. of cane per acre. On the other hand, its complementary plot

that had sufficient moisture gave 26,856 or the highest in the series. At the commencement when the field is starved, the cane on the plot without cowpea has abundance of water and gets a better start for growth while the cane with the green manure has to share its supply with the cowpea and is more or less smothered by it. This explains the why of the superiority of the yields on check plots. Thus unless there is moisture to saturate the soil, the green manure does not show its benefit. The results are given in Statement III.

*Manurial Experiments.*—The results from area under Chemical Department will be reported upon in detail by that section. Superphosphate has invariably told effect and produced an infinitely better out-turn.

Coming to bulk plots, ammonium phosphate applied at the rate of only 100 lbs. to the acre almost doubled the crop, the figures being 34,772 from the treated as against 18,572 from the untreated plot. (*Vide* Statement IV.) The lower third had probably some of the leachings of the manure from the middle third and has thus shown a bigger crop. The manure which had been sent as specimen for trial was not available for further experiments.

Lime applied to different canes on one of the upper plots does not apparently indicate any beneficial effect. The difference in the treated and untreated plots of Red Mauritius was more due to the faulty germination of the latter. (Statement V.)

In the varietal plots alternate thirds were manured with cake just to find out the value of this manure. The great and astounding difference between the yields as shown in Statement VI shouts out in bold and unmistakable voice and conclusively proves the benefit of this manure. The out-turns have been doubled and more than doubled, the non-tillering Java deriving the greatest advantage and showing figures of 10,692 from untreated as against 29,032 from the treated portion. There cannot be any doubt to the assertion that good cane cannot be grown in the malnad without the use of cake and supers.

The financial gain in money in the application of cake is indicated by the following figures, the manure costing Rs. 140 per acre.

		Cake.	No. cake.
Java	...	311 11 0	114 6 0
H. M. 312	...	492 8 0	231 4 0
H. M. 312	...	607 8 0	241 14 0
H. M. 544	...	416 4 0	173 12 0
Local striped	...	249 12 0	127 8 0

*Varieties.*—Of varieties, Java has fared the worst this time being superior only to the local striped. Red Mauritius came next, having 37,476 followed by H. M. 544 that yielded 38,826 lbs. Higher than these stood H. M. 315 and H. M. 553 with 43,038 and 45,944 lbs. per acre. As I already said, both of these are good canes being rich in their sucrose contents. H. M. 315 is a thin cane and has a reddish tint. It cannot thus ever win the favourable impression of the cultivator. Five hundred and fifty three has however, all the good qualities and bids fair to be the future cane of the malnad. It has gone out of the precincts of the farm and is doing well on the raiyats' fields round about Sagar. Five hundred setts were also given out from the farm for distribution.

H. M. 312 apparently exhibited the best growth, but its luxuriance was over-balanced by its red colour, lodging habit and the production of a non-setting soft jaggory. The variety has thus been thrown back, though it has found favour with some malnad cultivators who make only liquid jaggory for exclusively home consumption.

H. M. 332 is another cane with some promise in it though red in colour. The analyses of different canes are found in Statement VII.

*Turmeric and Ginger.*—With a view to find out what other rotation than paddy would be more desirable with cane, crops like turmeric and ginger were planted on the sugar-cane area. Ginger did not withstand the heavy monsoon, while turmeric produced something. In 1925, again the same trials will be continued with onion added to the list.

*Areca.*—The yield of areca was almost as good as that of last year, coming up to 4,645 lbs., of which 1,545 was unshelled gotu.

*Paddy.*—This is the principal crop of the farm occupying an area of 10 acres. The out-turn was extremely poor as the whole land was submerged and flooded several times, and as it was again the second year that it had this disadvantage.

*Manurial Experiments.*—There has been tried under the control of the Chemical section who will probably be able to submit a better account of the results. It may, however, be added here that these plots suffered from excessive rainfall as much as if not more than other areas of the farm.

*Varieties.*—Owing to the change in the condition of the season, the imported varieties have occupied different places in the competition. None of them seem to be equal to local jaddu which has uniformly stood first. Hosahalli bili-betta is somehow struggling hard to approach it. Our attempts hitherto to acclimatise superior paddies of other regions have not been crowned with success. The only salvation now lies in making careful selection out of local types and evolving a variety that will suit all the conditions of the malnad. This is manifestly a work that has to be taken up by the Botanical section. The Coimbatore B. 24, which was tried on a very small plot has shown some encouraging results.

*Banku.*—Which did extremely well on raiyats' fields, and admirably roughed the malnad weather came nowhere in our trials on the farm. There was one disadvantage with it. Matured as it did earlier than others, it became the target of the depredation of birds which vitiated the experiment a good deal. I have arranged to have it tested on a larger scale on different terraces in 1925.

The green manure was a washout and rotted root and branch as soon as the rains began. It failed miserably and came up to nothing. It is now seen that unless normal seasons return and the fury of the monsoon is abated a bit the trial of green manure is almost impossible. In places where irrigation is available, raising of sunnhemp or cowpea is somewhat practicable. The problem therefore remains as knotty as ever and requires very careful handling.

The results however show one thing as a side issue. The beneficial effect of supers is markedly seen and it remains now to be found out what would be the most economical dose.

*Dry Crops.*—The advent of later rains gave a better chance for the late sown dry crops. Ragi thus showed better yields than last year as can be seen from Statement XI, M. M. 1 was the best and it also suits the caprices of the monsoon and is not injured so much either by drought or the excessive wet. The variety has been distributed in all parts of the malnad and the farm has thus been responsible to its spread to 50 acres. Several selections have also been made by Mr. Daniell, and there are under trial in the season of 1925. Any good varieties evolved will be more useful for the semi-malnad areas as the growing of ragi for that matter of any dry crop is at a great discount in the malnad. Our progress in this direction is bound to be slow. The farm has issued 80 seers of ragi for distribution. Other varieties of ragi sent from the Botanical section are also being tried in 1925.

*Groundnut.*—The short season types of Spanish and small Japan do thrive very well even in the heart of the malnad. In 1924, both of them grew luxuriantly on the farm, the Spanish-pea nut showing an extraordinarily good out-turn of 1,256 lbs. per acre on one of the plots, while small Japan gave 971 in the adjacent plot. This crop is a great success both in the malnad and maidan, of course, when grown only in large areas. Otherwise, a few acres grown here and there in scattered areas are likely to be the target of the attack of wild boars jackals, crows and rats, which unmercifully dig and prey upon the pods leaving nothing to the labour of the toiling grower. That is why it has not caught the malnad and spread there and stray attempts have come and gone time and again.

Some manures were tried for this most popular crop, which has extended to more than 35,000 acres in my division. Superphosphate does not seem to have evoked such good response as its mixture with ammonium sulphate. As will be seen in Statement XIV, supers alone has brought about an increment of 73 lbs. and has hardly paid its way, the fertiliser involving an additional outlay of Rs. 8-12-0. On the other hand, an extra of 140 lbs. of ammonium sulphate (or Rs. 15 in money) suddenly increased the crop by 393 lbs. or resulted in a financial gain of Rs. 49 per acre, and in a net of Rs. 25-4-0 after deducting the value of manure. On

another plot where the sweepings of manure godowns consisting of cake and supers had been used, the yield went up to 1,256 lbs. This year (1925), combination of supers and cake, and of supers and ammonium sulphate, have been arranged for and are likely to afford a cue to the economic manuring of this all important crop.

Several varieties (ten of them) that have since arrived from Hebbal will be experimented with on small strips as want of space forbids their being shown on a larger scale. The desirable cross that has been evolved at Hebbal has not yet become available for our trial at Marthur.

More than 500 lbs. of small Japan and Spanish were given out to the general section for distribution of raiyats in the Sagar Range.

*Chillies.*—Both M. F. 1 and M. F. 2 did better than the local variety and the seeds of both have been made available for distribution, half a maund of each variety having been set apart for this purpose. Further selection have also been attempted by Mr. Daniell who has been in charge of the farm.

*Other dry crops.*—Coming to other dry crops, dry land paddy was a failure on account of the heavy rains and did not even deserve any after cultivation. In 1925, two varieties are being tested. Maize though it grew to something was not up to much. Jola and castor fared miserably.

*Silo.*—Only one silo could be filled in as more grass was not available on account of the battering rain which smothered its growth. It was also too succulent and produced a loss of more than 40 per cent.

A pit measuring 14 feet deep and 10 feet in diameter was filled with 13,808 lbs. of grass, 148 lbs. of jola stalks, 9 lbs. of cow-pea and 101 lbs. of green sunnhemp or a total 14,176 lbs., which roughly gave 12½ lbs. per C. ft. The silo was opened after the lapse of four months and was exceedingly relished by the farm stock. The following additional information may be useful:—

Quantity of the clean silage obtained	...	...	8,042 lbs.
Per cent to green originally put in	...	...	56.7 per cent.
Animals fed	...	...	10
Number of days it lasted	...	...	39

Sun-flower has entered the programme of 1925, and will probably be ensiled if it attains a good growth.

*Plantains.*—This subsidiary shade crop was immensely benefitted by the fertiliser used for areca and gave an out-turn which meant more than Rs. 50 in money.

*Pepper.*—The Kalluvalli and Balamkota varieties got by Dr. Venkata Rao years ago have begun to bear their maiden crops. Cuttings from these will soon be taken for further propagation. Some local malligesara cuttings have also been planted.

*Orchard.*—The fruit plants got from Bangalore have not yet been put into the ground.

The orchard that is situated higher up on the dry area is suffering acutely from drought, and citrus plants do not bear well at all with all the manurial treatment they have been receiving. The mangoes are the only ones that are green and growing, but the fruits of Rasapuri and even Malgoa seem to rot at the slightest advent of even pre-monsoon rains. The only variety that stands well is the *Sundershaw*.

*Miscellaneous work.*—The tank sluice has been repaired and its bund has also been raised so as to make it hold an additional foot of water.

D. G. RAMACHANDRA RAO,  
*Assistant Director.*

## STATEMENT No. I—(MARTHUR FARM).

Rainfall statement for the year 1924.

Months	Total per month		Remarks
	Inches	Cents	
1924—January	...	..	
February	...	..	
March	...	10	
April	...	47	
May	...	49	
June	...	21	04
July	...	68	70
August	...	23	07
September	...	8	12
October	...	3	20
November	...	1	60
December	...	1	05
Total	..	127	84

## STATEMENT No. II—(MARTHUR FARM).

Results of spacing experiments on sugar-cane during 1924-25.

Variety	Nature of experiment	Yield in lbs. of cane per plot of 2½ guntas	Average yield per acre
Java ..	21 rows 2' apart ..	2,117	33,872
	14 rows 3' apart ...	1,284	20,544
	12 rows 3½' apart ...	679'5	18,857

## STATEMENT No. III—(MARTHUR FARM).

Sugar-cane green manurial experiments during 1924-25.

Plot No. G. 3. Java cane and cowpea.

Different manurial treatments	Green manure		Yield of cane	
	Per plot of 1 2/3 guntas	Per acre yield	Per plot of 1 2/3 guntas	Per acre yield
Green manure with supers ...	1	Lbs. 244	Lbs. 491	11,784
	2	239	1,119	26,856
	Average	241½	805	19,320
Green manure alone ...	1	268	636	15,264
	2	174	410	12,240
	Average	221	523	13,752
Check ...	1	..	975	23,400
	2	..	655	15,720
	Average	..	815	19,560

Cowpea sown along with sets on 15th February 1924.

Cut on 8th April 1924.

Super used with cowpea at 250 lbs. per acre.

## STATEMENT No. IV—(MARTHUR FARM).

## Ammonium sulphate test on sugar-cane.

	Per plot 5 2/3 guntas (lbs. of cane)	Per acre (lbs. of cane)
Check (Upper third of the plot) ... ..	2,631	18,572
Check (Lower third of the plot) ... ..	3,755	26,506
Ammonium phosphate (Middle third of the plot) at 100 lbs. an acre.	4,926	34,772

## STATEMENT No. V.

## Liming experiments on cane for 1924-25.

Nature of Experiment	Variety of cane	Yield in lbs. per gunta	Average per acre
Lime applied at 1 ton per acre .. ..	Java .. ..	331	13,240
	H. M. 544 .. ..	474	18,960
	R. M. .. ..	394	15,760
No lime .. ..	Java .. ..	420	16,800
	H. M. 544 .. ..	419	16,760
	R. M. .. ..	190	7,600

## STATEMENT No. VI—(MARTHUR FARM).

## Varietal test of canes 1924-25.

Varieties of canes	Groundnut cake applied at one ton per acre		No cake	
	Average of	Yield in lbs. per acre	Average of	Yield in lbs. per acre
PLOT 4.				
Java as check ... ..	2 2/9 G.	29,032	1 1/9 G.	10,692
H. M. 553 ... ..	1 13/27	45,944	20/27 G.	26,244
H. M. 312 ... ..	Do	56,727	Do	22,410
H. M. 544 ... ..	Do	38,826	Do	16,200
PLOT 5				
Java as check ... ..	1 1/9 G.	25,781	2 2/9 G.	10,980
H. M. 315 ... ..	20/27 G.	43,038	1 13/27 G.	25,056
Local striped ... ..	Do	23,220	Do	11,993
Red Mauritius ... ..	Do	37,476	Do	17,004

## STATEMENT No. VII—(MARTHUR FARM).

## Analysis of seedling canes.

	Date of planting	Data of Analysis 17—18th January 1925		Data of Analysis 16th February 1925	
		Sucrose	Glucose		
H. M. 553 .. ..	13th February 1924	17'00	0'62	18'10	0'41
H. M. 315 .. ..	14th February 1924	17'60	0'25	18'20	0'39
H. M. 312 .. ..	13th February 1924	18'00	0'52	16'10	0'62
H. M. 544 .. ..	Do	18'50	0'62	17'60	0'52
H. M. 320 .. ..	12th February 1924	17'80	0'52	17'75	0'52
H. M. 600 .. ..	Do	16'63	0'90	16'55	0'70
H. M. 313 .. ..	Do	18'40	0'41	17'80	0'62
H. M. 332 .. ..	Do	18'20	0'41	18'75	0'41
Java highest under manurial experiments.	..	18'50	0'21	19'50	0'21



STATEMENT No. VIII—(MARTHUR FARM).  
Paddy varietal tests (Transplanted yields).

Serial No.	Name of variety	Yield per acre in lbs.		Remarks
		Grain	Straw	
1	Walya .. .. .	2,180	1,900	
2	Jeddu .. .. .	2,040	2,880	
3	Hosalli bili bhatta .. .. .	2,040	2,400	
4	Musalli .. .. .	2,000	2,080	
5	Doddabile bhatta .. .. .	1,940	1,940	
6	Siddasale .. .. .	1,920	2,020	
7	Puttasanna .. .. .	1,880	2,000	
8	Shimoga sanna .. .. .	1,880	2,140	
9	Hasadi .. .. .	1,480	1,760	
10	Hasan bile bhatta .. .. .	1,160	1,820	
11	Alur sanna .. .. .	1,120	2,520	
12	Jeerige sanna .. .. .	800	1,600	
13	Banku .. .. .	640	980	

STATEMENT No. IX—(MARTHUR FARM).

Paddy green manurial tests. Each plot 1/40 acre. Green manure sown on 2nd February 1924 failed. Jaddu paddy transplanted on 14th July 1924. Harvested on 30th November 1924.

Experiment	Plot No.	Supers applied		Green manure obtained		Yield subsequent paddy in lbs.			
		Per plot	Per acre	Per plot	Average per acre	Grain		Straw	
						Per plot	Average per acre	Per plot	Average per acre
Sunnhemp with supers	74	6	...	.....	.....	60	...	69	...
	81	6	240	Failed	.....	50	2,400	55	2,480
	77	6	...	.....	.....	55	...	62	...
	80	6	240	Failed	.....	55	2,220	69	2,620
Average	...	...	...	...	...	2,210	...	...	2,550
Sunnhemp alone	73	...	...	.....	.....	36	...	42	...
	76	...	...	.....	.....	38	...	38	...
	83	...	...	Failed	.....	58	1,760	62	1,880
Cowp alone	78	...	...	.....	.....	48	...	46	...
	82	Nil.	...	Failed	.....	48	1,920	49	1,900
	Average	...	...	...	...	...	1,840	...	1,890
Check	75	...	...	.....	.....	58	...	51	...
	79	...	...	.....	.....	62	...	75	...
	84	Nil.	...	.....	.....	62	2,360	56	2,400

STATEMENT No. X.

Chemical experiments on paddy (Jeddu) 1924-25.

C. M. Cattle manure.  
Jeddu transplanted on 25th July 1924.  
Manures applied on 25th July 1924.

Crop harvested on 7th December 1924.  
Total number of plots 36. Area 36 guntas.  
Each figure average of 3 plots.

Serial No.	Treatment	Average yield per acre	
		Grain	Straw
1	Check plots—only C. M. ... .. .	993	1,773
2	C. M. plus 2'5 lbs. Am <sub>2</sub> SO <sub>4</sub> ... .. .	1,073	1,760
3	C. M. plus 2'5 lbs. Am <sub>2</sub> SO <sub>4</sub> plus 7 lbs. supers ... .. .	1,247	1,620
4	C. M. plus 10'5 lbs. supers plus 2'5 lbs. Am <sub>2</sub> SO <sub>4</sub> ... .. .	1,150	1,527
5	C. M. plus 10'5 lbs. super plus 3'75 lbs. Am <sub>2</sub> SO <sub>4</sub> ... .. .	1,093	1,813
6	C. M. plus 10'5 lbs. super and 5 lbs. Am <sub>2</sub> SO <sub>4</sub> ... .. .	1,223	1,553
7	C. M. plus 3'75 lbs. Am <sub>2</sub> SO <sub>4</sub> plus 3'5 lbs. super ... .. .	1,273	1,987
8	C. M. plus 3'75 lbs. Am <sub>2</sub> SO <sub>4</sub> plus 7 lbs. super ... .. .	1,187	1,800
9	C. M. plus 3'75 lbs. Am <sub>2</sub> SO <sub>4</sub> plus 10'50 lbs. supers ... .. .	1,240	1,907
10	C. M. plus 10'5 lbs. supers plus 6'25 lbs. G. nut cake ... .. .	1,280	1,773
11	C. M. plus 10'5 lbs. super plus 9'5 lbs. ... .. .	1,280	1,947
12	C. M. plus 10'5 lbs. super plus 12'75 lbs. ... .. .	1,527	2,173

## STATEMENT No. XI.

Ragi yields 1924-25.

Variety	1923-24 Grain	Yield per acre in lbs.	
		Grain	Straw
Check local .. .. .	309	600	730
M. M. 1 .. .. .	507	703	947
M. M. 2 .. .. .	387	511	773
M. M. 3 .. .. .	400	542	667
M. M. 4 .. .. .	400	641	953

## STATEMENT No. XII—(MARTHUR FARM).

Chillie yields 1924-25.

No.	Variety	Dry yield per acre lbs.
1	Local Marthur .. .. .	286
2	M. F. 1 (Corresponding to C. P. 1) .. .. .	320
3	M. F. 2 (Corresponding to C. P. 2) .. .. .	370

## STATEMENT No. XIII.

Groundnut yields.

No.	Variety	Per plot of 7 guntas	Per acre
1	Spanish peanut .. .. .	Lbs. 220	Lbs. 1,256
2	Small Japan .. .. .	170	971

## STATEMENT No. XIV—(MARTHUR FARM).

Manurial tests on Groundnut variety—Small Japan.

Rates Supers—140 lbs. to the acre.

Am<sub>2</sub>SO<sub>4</sub>—140 lbs. to the acre.

Treatment	Area under experiment	Yield dry weight	Yield per acre in lbs.
	Guntas	Lbs.	Lbs.
Check .. .. .	4	46	460
Super alone .. .. .	4½	60	533
Super plus Am <sub>2</sub> SO <sub>4</sub> .. .. .	3¼	80	853
Super 74 lbs. plus Am <sub>2</sub> SO <sub>4</sub> 74 lbs. .. .. .	19	290	610

ANNUAL REPORT OF THE LIVE STOCK SECTION,  
FOR THE YEAR 1924-25.

Mr. W. Davison was in charge of the section during the year 1924-25. One hundred and twenty-six days were spent on tour, and every district was visited by him. He attended the District Conferences of Tumkur, Mysore and Kolar, as also the cattle show at Hassan.

The Office correspondence during the year increased to 8,711 inward and 5,615 outward communications as compared with those of previous years; *i.e.*, 7,136 outward and 4,768 inward respectively.

*Draught Cattle.*—The number of breeding bulls maintained in the districts has been 12 as against 14 of the previous year, and the report of these will appear in the Report of the Civil Veterinary Department.

Not more than 2 subventions were granted during the year for lack of funds.

*Rayanakere (Palace) Dairy Farm.*—The charge of the Farm has remained with Mr. B. Lakshmi pathi Naidu, G. B. V. C., during the year. Two Agricultural Inspectors also worked on the farm during the year.

*Cattle Yard.*—The strength of the herd at the beginning of the year was 253. There were 76 births and 2 purchases during the year, making the total strength to 331. There was a decrease of 122 in the herd. Of this decrease, 35 are due to deaths on account of disease, 80 on account of sales which were necessary to raise the general efficiency of this farm, and 7 due to transfers to other herds; thus leaving a balance of 209 at the end of the year. Details of the composition of the herd, births, deaths, etc., are shown in the subjoined statement. The number of deaths was 35, of which 5 were cows 28 calves and 2 bulls.

Detailed classification of the herd showing births, deaths, etc.,  
on Rayankere Dairy Farm.

Breed	Strength on 30th June 1924	Sales	Transferred to cows	Transferred to bullocks	Transferred to breeding bulls	Deaths	Births	Purchases	Strength on 30th June 1925
Sindi bul's ...	2	...	...	...	2	2	...	...	2
Sindi cows ...	60	25	18	...	...	4	...	...	49
Sindi Bull calves ...	7	2	...	2	2	...	2	...	3
Sindi Heifer calves ...	35	3	18	...	...	1	3	...	16
Hallikar cows ...	16	3	...	...	...	...	...	...	13
Mixed cows ...	1	1	4	...	...	...	...	...	4
Mixed Bull calves ...	5	...	...	3	...	1	...	...	1
Mixed Heifer calves ...	3	1	...	...	...	...	...	...	1
Ayrshire ½ bred cows ...	9	1	4	...	...	...	...	...	12
Ayrshire Bull calves ...	1	...	4	1	...	...	...	...	...
Ayrshire Heifer calves ...	10	...	...	...	...	...	...	...	6
Holstein ½ bred cows ...	...	1	4	...	...	...	...	...	3
Holstein Bull calves ...	40 (39)	36	4	1	...	11	30	...	22
Holstein Heifer calves ...	50 (51)	2	...	...	...	11	28	...	61
Holstein X Ayrshire sindi cows ...	...	...	4	...	...	...	...	...	1
Holstein X Ayrshire Bull calves ...	4	5	1	...	...	2	3	...	...
Holstein X Ayrshire Heifer calves ...	3	...	...	...	...	...	4	...	6
7/8 Holstein Bull calf ...	...	...	1	...	...	...	1	...	1
Holstein Sindi ¾ bred Bull calves ...	...	...	...	...	...	...	1	...	1
Holstein Sindi Heifer calves ...	...	...	...	...	...	...	1	...	1
Holstein Hallikar ½ bred Bull calves ...	...	...	...	...	...	...	1	...	1
Holstein Hallikar Heifer calves ...	...	...	...	...	...	1	1	...	...
Holstein bulls ...	3	...	...	...	...	...	...	...	3
Holstein cows ...	...	...	1	...	...	1	...	...	...
Holstein Heifer calves ...	...	...	1	...	...	1	1	2	1
Jersey ...	1	...	...	...	...	...	...	...	1
Total ...	253	80	32	7	2	35	76	2	209

The reason for the higher rate of mortality among the calves is partly due to white scour among baby calves and digestive troubles and partly to epidemics that prevailed on the Farm. Appendix No. I shows the number of deaths due to different diseases. Two outbreaks of foot and mouth disease one in August 1924 and the other in December 1924 have had a very serious adverse effect on the development of the herd. The milk yield of all animals affected was reduced, in some cases very seriously and cows near to calving at the time of the outbreak did not freshen with as good a yield as could be normally expected. Breeding operations were seriously interfered with and had to be completely stopped for nearly 3 months and the growth of young cattle was materially retarded as a result of outbreaks. Experimental work in feeding was interfered with and in some cases the work of several previous months was rendered useless as no conclusions could be arrived at. The results of the year's work are thus less than would have been the case under normal conditions. As soon as the "Foot and mouth" disease subsided there was an outbreak of "Anthrax" at the end of March 1925.

Two Holstein heifers were imported to this State during the year, out of which one heifer called "Countess" calved on the 11th March 1925, a beautiful heifer calf. She milked for 81 days giving a total yield of 2,806 lbs. daily average

being 33.4 lbs. She was attacked by "Hyper pyxia" and died on the night of the 29th May 1925, after 7 days illness. The other Holstein heifer called "Echo Pride" fell a victim to "Anthrax" along with three Holstein half bred heifers and a Holstein half bred bull calf which gave every promise of turning out a good breeding bull.

The number of animals sold out of the Farm was 80 as against 36 of last year, and a sum of Rs. 4,905-8-0 was realised from these Sales. There were 4 abortions and 1 premature birth during the year. This may be attributed to the unstable health of animals due to the effect of "Foot and Mouth disease."

There has been some improvement in the milk production. The average over the whole herd is 5.9 lbs. per diem as compared to 5.4 and 4.1 lbs. in the previous years. Total production of milk is 1,89,315 lbs. for 82 cows as compared to 177,444 lbs. for 86 cows, and 162,118 lbs. for 93 cows in the years 1923-24 and 1922-23 respectively. This represents an increase of 32 lbs. daily throughout the year from a smaller number of cows and in spite of the prevalence of Foot and Mouth disease for some time, and also cessation of coverings and consequent calvings during the latter part of this official year. The number of cows has been steadily reduced from 107 in 1921-22 and 93 in 1922-23, to 85 in 1923-24 and 82 in 1924-25, while the milk yield has improved as well as the per capita production.

It is seen from the statement below, that Hallikar cows are the lowest percentage of animals in milk during the year. The high fluctuation from year to year shows the inefficiency of the breed from a Dairy standard of view. It has become possible to regulate the calvings more or less evenly throughout the year from Sindi cows. The longest dry period in the herd was 329 days in the case of the Sindi cow and the shortest dry period was 51 days.

Statement showing the percentage of animals in milk during the year 1924-25.

Particulars	1922-23	1923-24	1924-25
	Per cent	Per cent	Per cent
Whole herd	49.3	59.3	57.6
Sindi	47.0	58.0	46.9
Hallikar	36.0	59.0	15.3

The average daily milk production of the different breeds is given in the Appendix No. II. The figures in the Appendix No. II indicate that half bred cows show a higher daily production, and it is only through them that the milk yield of farm has been kept up.

From the young stock 18 Sindis, 4 mixed, 4 Ayrshire half bred cows and 5 Holstein half bred cows, have freshened and have been added to the milking herd. The yields of these are tabulated (*vide* Appendix No. III) as also the yields of their dams. The Ayrshire half bred cows except 76 and 77 were born on the Farm from cows purchased in calf to Ayrshire bulls. Of the 5 Holstein half bred cows that calved, one was sold away as it was suffering from Jones disease.

Sixteen cows have given more than 300 lbs. of milk during the year. There are only 9 cows below the herd average in milk yield, out of which 3 are Hallikar and the rest Sindi. The average weight of first calving cows is 631.3 lbs. There are now 62 Holstein half bred heifers, 25 Holstein half bred bulls and one pure Holstein heifer calf. During the year 76 calves were born, out of which 34 are Holstein half bred heifers and 36 bulls, one pure bred Holstein and 5 Sindi calves.

The number of coverings by each bull and calves born to each bull during the year is shown in the attached Appendix No. IV.

The birth weights of the calves of different breeds are tabulated. (*Vide* Appendix No. V.)

It is quite interesting to note that the heifer calves more especially the cross bred animals, show a higher birth weight than the bull calves. The bull calves gave a higher birth weight last year. The Holstein heifer calf has been keeping

good health. She weighed 67 lbs. at birth and now her weight is 232 lbs. within an interval of about  $3\frac{1}{2}$  months, showing an increase of  $1\frac{1}{2}$  lbs. per day. It is hoped that this one, at least, will grow up to demonstrate the milking power of the breed.

Another marked improvement which has been made on the farm, is to allow cattle to remain in the open air both day and night and not to bring them to the stalls even during rains. This applies to our milch cows also which are brought into the stalls only for giving them their grain ration and for milking, after which they are driven away into the open yard. Feed, water, silage and hay are provided in masonry troughs constructed for this purpose in the cattle pens outside the cattle yard. At the commencement, a few animals showed slight indisposition, but they do not seem to be affected in any way now.

#### FARM SECTION.

*Rainfall.*—Total rainfall during the year was 27 inches and 76 cents as against 23 inches and 32 cents of the previous year.

*Extent of the Farm.*—Of the 700 acres which comprise the farm, 200 acres are at present under cultivation, against 150 acres of last year. About 50 acres are occupied by buildings, roads, calf-rooms, etc., and 300 acres are reserved for cutting green grass in the monsoons and making hay in the later part of the year, 130 acres for pasturing cattle and the rest is waste land.

*Crops.*—As usual, only fodder crops such as jola and cowpea and sun-flower were grown during the Hingar of last year; and in the Mungar of the current calendar year, velvet beans and 'avaray' were grown in small patches, the former being for seed and the latter for making hay.

Natal grass and Kikuyu grass were imported from Northern India and grown in small patches for experimental purposes. These proved quite satisfactory and it is intended to put them on a large scale this year.

The Hingar rains of last year did not come up to mark when compared with the previous years and it has been worse with the Mungar of this year. The crop therefore which stands on the Farm does not come up to even 30 per cent of what it has been in the previous years.

All the produce of the cultivated area was turned into ensilage making up a quantity of 1,400 tons against 900 tons of the previous year including 200 tons of silage made of Johnson's grass cut in kaval. Due to the scarcity of rain, at the end of last calendar year, the cattle had to be put on silage, as early as November while in previous years, it was being started in January, which means the animals were kept on ensilage for 8 months getting green grass from the kaval only for a period of 4 months. Due to the extension of cultivated area and the consequent increase of crop 6 more silo trenches each of a capacity of 100 tons were dug out close to the cattle yard to facilitate hauling. The silage samples of fodder crops grown on this farm were sent to various cattle shows and Agricultural Inspectors for demonstration purposes.

With a view to popularise the preparation of ensilage 25 acres of sun-flower crop was reserved for seed purposes and 18,000 lbs. of seed were made out of it, to supply the needs of the farm and also to sell to the public through the Agricultural Department. Till now, Rs. 506-11-0 has been collected and 8,500 lbs. are still in stock.

*Live-Stock.*—In addition to the 2 mules and 3 horses that were on the farm 4 more horses were purchased. Out of the total number of horses, 3 saddle horses were sold and the rest were used for almost all the field work and kaval operations. There were 34 bullocks at the beginning of the year, out of which 9 were sold as they were old and 2 died on account of old age.

*Manuring.*—All the stable and stall manure was preserved in pits and applied to fields in fairly large dozes, (12-15 tons per acre). Thus, we were able to manure about 600 acres.

*Kaval.*—As usual, for nearly seven months in the year commencing from the end of June, the cattle were fed on green grass at 3 tons per day, given chaffed every day. It works out to 630 tons of green stuff. About 200 tons of paddy grass was

turned into ensilage as already said and the rest of the grass was made into hay which is 200 tons, of which about 50 tons were baled in the kaval alone and stacked. A sum of Rs. 9,000 could have been realized if there was a demand for the hay that is in stock.

*Buildings and Construction work.*—Three mangers and 2 water troughs were built in the paddocks where animals are let loose for being fed and watered at their will and pleasure. It has also provided an easy roam about for the stock and they look quite comfortable and happy there, in preference to their being stall tied where they are fed and watered at the convenience of the people attending them. A new segregation shed, the need of which was long felt, has after all been completed this year and it is being made use of, for cases of contagious abortion. The need for an implement and bullock shed combined with a shed for tractors is badly felt. At present the implements are left under a thatched shed and the tractors under the shade of trees. As for the bullocks they are now being tied with the cattle which is a source of danger to the herd as these bullocks have to be often used for road work where they may come in contact with diseased cattle and infect the herd.

*Road work and Fencing.*—Much attention could, not be given to these works for want of sufficient funds and labour. However, two furlongs of fencing was put up with re-inforced concrete posts got from the Railway and General Engineering Co., Bangalore, and a mile of road was metalled. A new track was made to the cocoanut garden which is shorter than the one that existed.

*Cocoanut Garden work.*—During the year the Garden work was undertaken in addition to the work of the farm and dairy. There are about 250 cocoanut trees, of which nearly half the number showed signs of decay and death. Besides these, there are 50 mango trees. All the shrubs and rank vegetation were cleared and three thatched houses are built in the garden and two men are made to live there. Five acres were ploughed and  $1\frac{1}{2}$  acres sown with lucerne which is already giving a crop and the other portion is kept ready for sowing maize.

*Training of Amrit Mahal Bullocks.*—This activity has continued on the same lines as last year. During the current year, 14 pairs of bulls were trained and sold.

#### HEBBAL AGRICULTURAL DAIRY.

The work of the dairy continued on the same lines as before. The strength of the herd has decreased from 47 to 27 as shown in the Appendix No. VI. This is due to the sale of old animals, bulls for covering purposes and some of the young stock which were considered useless for breeding work. The seasonal conditions in the earlier part of the year, together with other factors reduced the average milk yield per calf bearing animal to 3.3. Considering that the herd of 27 had only 5 cows in milk and that these are of no milk pedigree at all, a bigger average cannot be expected. The individual records of the cows are shown in Appendix 'VII.' Till the heifers that are in the herd now come to yielding age, the milk yield of the herd cannot be said to have improved to any extent.

The bull kept for outside service covered 146 cows as against 109 in the previous year. A number of cows were not allowed to be covered, during the period, as Foot and Mouth disease prevailed in the herd.

A show of calves, born to the breeding bulls of the dairy was held at the time of the Annual Meeting of the Mysore Agricultural and Experimental Union. The number of calves exhibited was 54, of which 25 were under one year, 22 were under two years and 7 were under three. The calves were on the whole satisfactory and among the prizes awarded by Dr. Leslie C. Coleman, the First prize was won by one bull calf belonging to a raiyat, Mr. Gopalgunda of Kodagihalli village. This has given an impetus to the other raiyats in the surrounding villages to pay more attention to breeding and rearing of calves in a better manner.

Ensilage as usual comprised the chief fodder of all cattle, about 217 tons being made. The wastage from different pits was kept to a low figure as shown in Appendix VIII. Out of five plots of land at the disposal of the dairy three have got standing crops of sunflower, cowpea, and jola. The other two plots are ready for sowing which will be done just after a shower of rain.

Thirty-seven animals were sold at a cost of Rs. 1,128-0-0, out of which 10 were cows, 5 heifers, 11 bull calves, 2 castrated bulls, 1 breeding bull, 2 breeding heifers and 5 Amrit Mahal calves.

#### VETERINARY HOSPITAL, HEBBAL.

Mr. P. S. Shama Rao was in charge of the Hospital during the year. In addition to his duties, the general supervision of the Dairy and Sheep Farm was given to him till the last week of April 1925.

He had to pay 137 visits to different villages for popularizing and increasing the utility of the breeding operations and for castrating the scrub animals. The number of bull calves castrated during his visits is 58, and the number of calves born to farm bulls inspected is 142. Seventy animals were treated in the villages in the course of his visits.

During the year, 989 animals were treated in the Hospital, of which 407 were from the farm and 582 from the surrounding villages.

The details of animals treated in the Hospital are as follows:—

Cattle .. .. .	617	Dogs .. .. .	21
Sheep .. .. .	259	Buffaloes .. .. .	33
Goats .. .. .	30	Horses .. .. .	29

These animals were treated for different diseases as classified under:—

General disease .. .. .	27	Generative .. .. .	70
Respiratory .. .. .	21	Nervous .. .. .	9
Digestive .. .. .	190	Entozoa .. .. .	36
Skin and connective tissue .. .. .	45	Eye diseases .. .. .	59
Wounds and injuries .. .. .	113	Irregular Molars .. .. .	40
Surgical .. .. .	113	Specific .. .. .	81
Contusions .. .. .	94		

The usual work of imparting instruction in Agricultural School in Veterinary Science has remained unchanged. The total number of classes held was 238, of which 116 being practical and 122 theoretical.

The need for isolation facilities in connection with the Hospital is being felt.

#### YELLACHIHALLI SHEEP FARM.

The charge of the Farm was under Mr. H. Shankaranarayan, Agricultural Inspector. Much difficulty was experienced during the year, for want of accommodation for the increased flock; the pens that were originally built temporarily having collapsed. As some of the funds had to be diverted for the purchase of material for the erection of a sheep shed, in place of the one that collapsed in the previous year, the work of this year was seriously handicapped.

Total strength of the farm during the year under review is 214 as classified under:—

Merino Hybrid Ram .. .. .	1
Ram .. .. .	1
Half Bred ewes .. .. .	20
Ewe lambs .. .. .	13
Ram .. .. .	18
Quarter bred rams .. .. .	..
" ewes .. .. .	10
Ewe lamb .. .. .	1
Three-fourth bred rams .. .. .	..
Ewe .. .. .	1
Ewe lamb .. .. .	2
Ram lamb .. .. .	..
Five-eighth bred ewe lambs .. .. .	3
Ram .. .. .	2
Double half bred ewe lamb .. .. .	1
Country ewes .. .. .	129
	202 Total
Bullocks .. .. .	5
Goats .. .. .	7
	Total .. .. . 214

Appendix No. IX shows clearly the strength of 1st July 1924, births and deaths and transfers, etc., during the year.

Out of 89 lambs born during the year, 39 died at a very young age for want of milk in their dams, although every attempt was made to feed them on cows milk. Most of the lambs died within a few days after birth, and some that had stronger vitality survived for some time, on hand feeding and died later. Weight of lambs at birth varied from  $2\frac{3}{4}$  to  $5\frac{1}{2}$  lbs. and average weight came up to 4 lbs. whereas in previous year it was over 6 lbs. The progress made by each lamb was not in proportion to the age when compared to previous years. This is due to lambing having started so late as October 1924, as a result of which almost all lambs became stunted in growth as they had not enough of chance to graze green grass in Kaval from November 1924 onwards when they were fit to graze well.

*Breeding operations.*—Three merino rams and 2 half bred rams were kept for breeding purposes. Out of these, 2 merinos died after six months of their arrival on the farm due to worms and lung affection. Till the end of the year, 269 ewes were covered by the merino rams and 35 were bred to the half bred.

Twenty half bred yearlings were set apart for the half bred ram to cover, with a view to get the double half bred progeny. Only 5 of these ewes lambed and others did not conceive.

*Clipping work.*—As some deaths, last year were due to spears of the grass on the pasture ground piercing the skin and even the intestines and lungs, all the sheep in the farm were clipped in the month of November, and a brush narrow was worked over the land where the grass was ripe. The result was quite satisfactory; no spears were noticed in the carcasses of sheep that died from other causes.

Appendix No. X shows the results of clipping of sheep.

In addition to farm work, clipping demonstration was held in January 1925, at Mr. M. P. Subramanyaraj Ursu estate near Mysore with the following results:—

Breed					Average wool weight
Country	...	...	...	...	0 14½ lbs.
Half breeds	..	...	...	...	1 12 lbs.

Explanations were given to the people who gathered there, on the use of clipping machine and its advantages over the country method of clipping.

*Dipping work.*—Dipping work was done 3 times during the year, that is November 1924, February 1925, and April 1925. First two dippings were given in Cooper's dipping solution and the last dip in Kymac solution. The results of these two solutions both in preservation of wool qualities and killing external parasites varied much.

Cooper's dipping solution takes a little longer time to kill parasites than the other solution. Secondly wool after washing in it becomes a little rough. If the powder is an old stock, the effect on parasites is very much less and in Kymac dip uniform strength is preserved for a long time. Also the Kymac solution requires not much of rubbing the animal in bath as in the other case to lose dirt on wool and it is quite enough if the animal takes 2 or 3 turns in the bath.

*Farm Section.*—About  $12\frac{1}{2}$  acres of land below the tank which was in possession of a raiyat was acquired for the farm, of which about  $4\frac{1}{2}$  acres are now in crop.

About 100 to 120 carts of sheep manure was collected in the year and the whole of it was used for lands under cultivation.

Sun-flower, jola, avare and cowpea were the important crops grown on the farm. Thirty-eight tons of jola and 12 tons of sun-flower were obtained in the first season, and the whole of it was made into ensilage. Thirty tons of sun-flower and 4,000 lbs. of avare and cowpea were obtained in the second season. Avare and cowpea were made hay for the young stock for feeding in summer. About 80 tons of ensilage was made out of jola and sun-flower crops and both of them were used for feeding the live stock.

In mungar, sun-flower and jola were sown but the crops were not promising for want of rains in time.

Grass in the kaval is very much improved this year, and the trouble with spear grass also was very much less as a result of heavy grazing till the end of August.



1924, after which all the live stock of the farm was sent to Yelwal compound with a view to preserve grass for the farm animals for grazing in summer. To eradicate spears on the farm, Natal grass seeds were sown in July 1924. Kikiyu grass also is grown on a small patch. This grass spreads rapidly on the ground and puts down spears better than Natal grass.

#### SISAL-HEMP PLANTATION.

About 3,309 plants were planted in October 1924 over about  $3\frac{1}{2}$  acres of land. Considerable number of plants died in summer for want of rain and many plants were destroyed by the wild pigs soon after planting.

#### SHEEP FARM, HEBBAL.

The work of the farm has been conducted on the same lines as before.

Detailed statement showing strength on 1st July 1925 on the farm, is shown in *Appendix XIV*.

The usual cross-breeding work has been continued and 70 cross bred lambs were born during the year. Two merino rams and 5 merino ewes were imported during the year, and all of the latter have dropped lambs. There are now 7 merino ram lambs and 2 merino ewe lambs which were born in the country and are doing well. It is hoped that these lambs would be more amenable to the climatic conditions than those imported as adults. The weight and age of those lambs are as follows:—

Merino Ram Lamb.	Notch No.	Age on 30th June 1925.	Weight lbs.
Do ...	... 8	824 days	25
Do ...	... 62	104	30
Do ...	... 65	84	37
Do ...	... 64	88	35
Do ...	... 66	84	23
Do ...	... 67	77	30
Do ...	... 69	70	23
Merino Ewe Lamb ...	... 63	104	19
Do ...	... 70	70	23

Out of a total strength of 340, thirty-six cross bred lambs were sold at a cost of Rs. 105-14-0 as they were not worth being retained for breeding purposes. Nine half bred rams were sold to owners of stocks at a cost of Rs. 90.

The results of clipping are as follows:—

#### CLIPPING RESULTS.

—	Merino ram lbs.	Merino ewe lbs.	Half bred lbs.	Quarter bred lbs.	Country lbs.
Average ...	9 4	6 9	1 10	0 14	0 11
Highest ...	9 8	7 8	3 4	1 4	1 12
Lowest ...	9 0	5 8	1 0	0 8	0 6

#### SHEEP HUSBANDRY WORK AT KOLAR.

The work in the improvement of sheep industry, is conducted by Mr. C. Narasinga Raju, Agricultural Inspector, who is the Secretary of the Kolar Sheep Breeders' Association. He was on tour for 178 days, and the other Agricultural Inspector who is working to assist him toured for 79 days, during a period of four months, and the two fieldmen together toured for 426 days. Number of correspondence has increased by 153 and 317 in the previous year, that is 259 outward and 849 inward.

At the end of the year 1923-1924, the number of members on the roll was 106 while in 1924-25 it rose to 147. Of this, about 60 per cent of the members are taking active part in conducting the work of the association.

During the past year, the number of members who owned white flocks of more than 25 white ewes was 11, while it has increased to 26 during the current year.

Total strength of white sheep maintained by the members has increased from 365 to 836. As some of the members found it difficult to replace their black sheep by white ones; it was arranged to supply them with white ewes in exchange for black ones in the proportion of 10 to 13. This system of distribution of white sheep has worked satisfactorily.

Orders for 18 cross bred rams were registered and many more had made oral requests. In all 11 cross bred rams were supplied. The demand has very much exceeded the supply.

Orders for 315 white ewes were received and not more than 100 could be supplied, as these have to be obtained from certain tracts where they exist.

During the year, the District Board was requested to set apart Rs. 1,500 for the association to help the members for establishing white flocks in the way of loans.

Two half bred rams have been lent to two villages during the breeding season with a view to demonstrate to the sheep breeders the benefit of using a high class ram for breeding purposes. These two rams have covered more than 80 ewes.

Propaganda work was done in 301 villages against 186 in the previous year. During the year under report, 2,140 sheep were clipped against 1,418 in 1923-24, and number of sheep dipped were 2,262 as against 3,790 in the previous year. Owing to lack of funds to meet the expenditure that has to be incurred in carrying the dipping tank, better progress in this direction could not be shown.

In the course of their tours, the Agricultural Inspectors castrated 115 rams belonging to the members of the association, mostly on their own requisition, as they have begun to realise the advantage of eliminating the undesirables from their flocks.

Nine jatras were visited and demonstrations were held. All the taluk conferences were attended and lectures were given in the improvement of sheep industry. In three district conferences wool specimens were exhibited.

A Sheep Show was held at Kolar during the District Conference in April 1925. There were 16 competitors and 140 white sheep were exhibited. Different kinds of wool yarns and fabrics prepared out of half bred and quarter bred, wool were also arranged and three prizes were awarded for the kamblies made of quarter bred wool. A challenge shield was also awarded to the best flock in the district maintained by a member of the association.

Considering the increasing demand for cross-bred rams and the inconvenience and delay attended with the transportation of stock from Yellachihalli and Hebbal Farms it is proposed to open a ram flock at Kolar. Arrangements are now in progress for the establishing of one, so that the demands of the members for half bred rams may be promptly complied with.

An attempt was made to grade and sell wool. One hundred and twenty-seven pounds of white wool and 87 lbs. of black wool were graded and sold through the association. The first grade country wool on an average fetched Rs. 0-6-6 a lb., and the second grade Rs. 0-5-0 a lb.

With the help of the Co-operative Department, a co-operative society was formed during January 1925. The members were explained the objects of the Kolar Sheep Breeders' Association and how far the association could help them in co-operative purchase of wool and supplying them clipping machines and higher quality of wool and also in conducting experiments in carding and spinning cross bred wool.

Eighty pounds of quarter bred wool was distributed to 12 members of the Kurubarpet Co-operative Society for trial.

A. A. MONTEIRO, LIEUT.,  
Officer in charge, Live-Stock Section.

## APPENDIX No. I.

Name of diseases	No. of deaths
White scour	13
Foot and mouth	1
Anthrax	6
Jhones disease	3
Abnormal presentation	1
Premature birth	1
Metritis	1
Enteritis	1
Diarrhoea	1
Old age	2
Other causes	5
Total	35

## APPENDIX No. II.

Particulars	1922-23	1923-24	1924-25
Whole herd	4'1	5'4	5'9
Milking Sindi	8'4	8'2	8'6
All Sindi	4'4	4'9	4'6
Milking Hallikar	5'7	4'4	6'6
All Hallikar	4'2	3'7	3'4
Milking Ayrshire half bred	...	...	17'7
All Ayrshire do	...	...	12'7
Hol. Sindi do	...	...	25'4
Hol. Mysore do	...	...	17'0
			17'6
			(Retention of placenta thus lower yield)
Hol. X Ayrshire do	...	...	17'1
Holstein	...	...	33'4

## APPENDIX No. III.

No. of Cow	No. of days in milk	Yield during lactation lbs.	Average daily yield during lactation lbs.	Remarks	Yield of dams in lactation lbs.
<i>Sindi.</i>					
B. 12	74	901	8	Still milking	.....
B. 23	153	1,352	8'8	do	1,170, 44, 3,064, 1,581, 396
B. 24	47	227	4'6	do	do
C. 37	351	5,052	8	do	.....
C. 28	339	3,659	6	do	1,927, 1,297, 2,299, 1,266, 625
C. 38	275	3,183	6	do	509, 266
C. 34	262	2,596	2	do	68, 453
C. 29	177	1,227	6'9	...	455, 464
C. 57	230	1,979	7	Still milking	951, 1,232
C. 49	228	2,689	9	do	241, 92
C. 33	190	1,732	9	do	1,584, 3,441
D. 2	299	3,002	8	do	1,681, 118
D. 4	280	1,996	5	do	1,538, 2,520
D. 20	252	2,431	7	do	1,861, 3,106, 3,345, 3,186, 1,682, 2,733
D. 11	105	1,004	9'5	do	1,602, 294
D. 7	113	374	3'3	...	3,468, 2,263, 3,110, 991, 2,525
D. 17	40	168	4'2	...	2,510, 2,168
D. 39	99	1,532	15	Still milking	3,835, 4,553, 3,212, 489, 2,662, 1,295
D. 14	73	333	6	do	1,218, 6,121

## STATEMENT III.—concl'd.

No. of Cow	No. of days in milk	Yield during lactation lbs.	Average daily yield during lactation	Remarks	Yield of dams in lactation lbs.
<i>Mixed.</i>					
C. 44	296	2,326	7'8	..	2,865, 226
D. 53	177	1,497	6	Still milking	2,068, 7,353
D. 47	65	809	12	do	1,423
<i>Ayrshire half breds.</i>					
C. 8	...	6,496	17'7	..	1,049, 3,332, 75
C. 12	366	7,943	26'8	Milking	2,534, 3,085, 2,443, 3,081, 1,720, 1615.
C. 14	373	4,716	12'6	..	2,423, 812, 2,198, 1,535, 1,530
C. 17	352	5,793	16'4	..	2,017, 2,272, 841
C. 18	137	2,365	17'2	..	3,845, 4,553, 4,212, 489, 2,662, 1,295.
C. 19	353	7,112	20'1	..	86, 2,877
C. 22	260	4,320	16'6	Milking	2,033, 1,135, 2,807, 117
C. 54	295	5,136	17'4	do	3,506, 4,160
D. 3	367	3,484	9'4	Dry	3,001, 3,274, 762, 3,071, 4,341
D. 9	176	3,222	18'3	Milking	70, 2,346
76	319	7,243	22'7	do	.....
77	125	3,792	30'1	do	.....
<i>Holstein half breds.</i>					
D. 76 Hol. Sindi 106.	...	2,698	25'4	Milking 23 lbs	2,537, 1,857, 3,649, 3,523, 2,131 3294.
D. 70 „ Hallikar 109	...	1,274	11'6	do 10 lbs	288, 1,510, 22, 449
E. 14 „ „ 75	...	1,197	22'5	do 22 lbs	458, 1,525, 1,500
E. 7 „ X Ayr. bred 73	...	1,254	17'1	do 15 lbs	5,306, 7,365
<i>Holstein.</i>					
Countess	81	2,806	33'4	Died	220, 76

## APPENDIX No. IV.

Name of Bull	No. of Coverings	Calves born in the year 1924-25	
		Male	Female
Walker	42	15	10
Echo	46	12	21
Sylvia	37	9	3
Sindi Bulls	20	2	3
Hol. Mysore half bred bull E. 31	7	..	..
Hol. X Sindi half bred E. 3	6	..	..
Amritmahal bull Kalyani	7	..	..
Carnation Prospector	1 Bred at Carnation stock farms	..	1 Born to Countess
	166	38	38

## APPENDIX No. V.

Particulars	1923-24	1924-25
Hol. Sindi Bull calves	32'8	48'5
„ Heifer calves	50'8	52'6
Holstein Hallikar bull calves	58'8	54'6
„ „ Heifer calves	47'7	59'3
Pure Sindi bull calves	45'2	42'5
„ Heifer calves	45'2	37'3
Hol. X Ayrshire Sindi bull calves	45'2	58'6
„ „ Heifer calves	41'4	57'2
Pure Holstein Heifer calf	...	67'0

## APPENDIX No. VI.

Statement showing the strength of Hebbal Dairy.

Details	Last year	Birth	Purchase	Transfers	Total	Deaths	Sales	Transfers	Total	Total to date
Cows ...	17	..	..	1	18	1	10	..	11	7
Heifers ...	12	8	..	..	20	1	6	1	8	12
Bull calves ..	17	4	..	..	21	5	11	1	17	4
Castrated bulls	2	..	..	..	2	..	2	..	2	...
Breeding bulls	3	..	..	1	4	..	1	..	...	3
Breeding buffalo bull	1	..	..	..	1	..	..	..	...	1
Breeding heifers	1	..	1	..	2	..	2	..	2	...
Amrit Mahal bull calves.	5	..	..	..	5	..	5	..	5	...
<b>Total ..</b>	<b>58</b>	<b>12</b>	<b>1</b>	<b>2</b>	<b>73</b>	<b>7</b>	<b>37</b>	<b>2</b>	<b>45</b>	<b>27</b>

Hebbal Dairy Herd Performance for the year 1924-25.

Register No.	Names	In the cow roll		Date of calving	Yield during lactation lbs.	Average over all lactations lbs.	Yield per diem 1st to last lactation	Progeny on hand
		Years	Months					
15	Suseela Seetha ...	4	10	3rd October 1922 Bull calf	2,723	...	...	Sold.
				25th October 1922 Heifer "	1,573	2,162	7.2	Sold.
				25th October 1922 do "	2,190	...	...	One heifer.
16	Abalya Raneé ...	4	10	8th July 1921 Bull calf	1,421	...	...	
				28th July 1924 do "	1,362	...	...	
				9th June 1923 Heifer "	1,321	1,028	4.0	Two heifers cow
				21st April 1924 do "	1,633	...	...	Abalya died.
				26th Feb. 1925 do "	...	...	...	
18	Meenakshi Lakshmi	4	2	4th January 1922 Bull calf	1,460	...	...	One bull.
				31st Jan. 1923 do "	1,296	1,304	6.8	
				20th Dec. 1923 Heifer calf	1,347	...	...	
				22nd Nov. 1924 Bull calf	1,113	...	7.6	One bull and 1 up
37	Sarada Saraswathi.	2	0	17th April 1924 Bull calf	1,488	...	...	to heifer calf 15-7-1925.
				31st May 1925 Heifer "	522	...	...	
40	Leela ...	4	7	5th Jan. 1921 Heifer "	2,746	...	...	
				28th Feb. 1922 Bull calf	2,866	...	...	(2 heifers and 17
				22nd Jan. 1923 Heifer "	2,134	2,582	7.0	bull.) Up to 15-1925.
				25th Jan. 1924 Bull calf	2,637	...	...	
				16th Dec. 1924 do "	1,618	...	...	
41	Lalitha Leela ...	3	1	23rd March 1924 Heifer	1,522	...	...	(Calf died early).
				3rd February 1925 Bull calf died	127	...	...	
50	Kamala Seetha ...	1	11	6th June 1924 Bull calf	2,156	...	...	Sold heifer 1 up to
				31st May 1925 Heifer "	448	...	...	15-7-1925.
52	Kaveri Raneé ...	1	2	24th April 1925 Twins Heifers	1,026	...	...	do

## APPENDIX No. VII.

Statement showing the milk yield from 1st July 1924 to 1st July 1925.

Names	1924						1925						Total lbs.
	July lbs.	August lbs.	September lbs.	October lbs.	November lbs.	December lbs.	January lbs.	February lbs.	March lbs.	April lbs.	May lbs.	June lbs.	
Leela ...	248	218½	219½	209½	158½	144½	310	206	231	209½	217	208	2,610½
Tara ...	57½	10½	Went	Dry	...	...	...	...	...	...	...	...	63
Yamuna ...	92½	34	4	Went	Dry	...	...	...	...	...	...	...	180½
Sakuntala ...	124	76	15½	...	...	24½	209½	85½	...	...	...	...	534½
Lalitha ...	170½	173½	155½	145½	93	93	90½	60½	55	16½	...	...	1,053½
Sarada ...	217	217	201½	199½	81½	...	...	...	...	...	...	248½	1,259
Abalya ...	209½	259	195	12½	5	...	...	15	196½	289½	252½	107	1,652½
Sunday ...	216½	117½	...	...	...	...	...	...	...	...	...	...	334
Kamala ...	415½	897	293½	267	210½	203	171	26½	...	...	...	293½	2,277½
Ganga ...	76	133	68	...	...	...	...	...	...	...	...	...	277½
Seetha ...	...	155½	15½	...	...	...	...	...	...	...	...	...	309½
Suseela ...	...	...	...	60½	467½	421½	393	240½	232	207½	118	41½	2,182½
Raneé ...	...	...	...	...	65	14½	...	...	...	...	...	...	79½
Minakshi ...	...	...	...	...	85	372	338	177	€0	9½	...	...	1,041½
Kaveri ...	...	...	...	...	...	...	...	...	...	31½	217	210	456½
<b>Total</b>	<b>1,827</b>	<b>1821½</b>	<b>1306½</b>	<b>1006</b>	<b>1166</b>	<b>1273½</b>	<b>1512</b>	<b>811½</b>	<b>774½</b>	<b>763½</b>	<b>804½</b>	<b>1203½</b>	<b>14,268½</b>

## APPENDIX No. VIII.

Ensilage statement for the year 1924-25.

Pit numbers	Amount filled in lbs.	Amount fed in lbs.	Wastage	Percentage of loss	Percentage of wastage	Per cent total loss
Trench I	86,142	65,845	9,935	11.8	11.5	23.3
Trench II	54,142	40,100	10,710	6	19.7	25.7
Pit I	64,540	In use	...	...	..	...
Pit II	66,490	Not opened	...	..	...	...
Pit III	1,03,340	"	...	...	...	...
Pit IV	62,530	"	...	...	...	...
Pit VI	51,650	"	...	...	—	...
Total	217 tons nearly	...	...	...	...	..

## YELLACHIHALLI SHEEP FARM—APPENDIX No. IX.

Detailed statement of Live-stock showing Births, Deaths, Transfers Sales, etc., during the year.

	Merino ram	Half bred ram	Ewe lamb	Ram lamb	Ewes	Bullocks	Goats	Total
Strength on 1st July 1924	3	3	54	67	137	7	26	297
Births	...	...	38	51	...	..	4	93
Deaths	3	1	56	73	49	..	3	185
Transfers	...	...	...	...	...	...	..	...
From	1	1 (Hebbal)	...	...	76	...	...	78
To	...	1 (Yellachihalli Sheep Farm)	...	...	...	2 (Rayanakere D. F.)	3	...
Sales	1	1 (wether)	8	26	11	..	20	66
Balance at the end of June 1925	1	1	28	19	153	5	7	214

## YELLACHIHALLI SHEEP FARM—APPENDIX No. X.

Results of clipping of sheep.

	Merino (lbs.)	Half bred (lbs.)	Quarter bred (lbs.)	Country (lbs.)
Average	8	1—9	0—14	0—11
Highest	..	3—8	1—4	1—9
Lowest	..	1—6	0—12	0—4

## APPENDIX No. XI.

Statement showing the strength of Sheep at Hebbal Farm.

	Increase					Decrease				Strength on 1st July 1925
	Last year	Purchase	Births	Transfers	Total	Transfers	Deaths	Sales	Total	
Merino Rams	3	2	...	...	5	...	4	...	4	1
" Ewes	4	6	...	...	10	...	2	...	2	8
" Ram Lambs	4	...	7	...	11	4	...	...	4	7
" Ewe Lambs	...	...	2	...	2	...	...	...	...	2
Half Bred Ewes	9	...	...	...	9	1	3	...	4	5
Quarter bred Ewes	5	...	...	...	5	...	1	...	1	4
Half bred Yearlings Rams	12	...	...	5	17	5	2	9	16	1
" " Ewe lambs.	34	...	2	1	37	12	4	9	25	12
" " Wethers	3	...	...	...	3	3	...	...	3	Nil
" " Ramb lambs.	8	...	5	...	13	...	2	5	7	6
" " Ewes	10	...	4	16	30	4	4	22	30	Nil
5/8th bred Ewe Lambs.	...	...	1	...	1	...	...	...	...	1
" Ram Lambs.	...	...	4	...	4	1	2	...	3	1
" Wethers.	...	...	...	1	1	...	...	...	...	1
Three-fourth bred Ewe Lambs	...	...	2	...	2	...	...	...	...	2
" Ram Lambs	...	...	4	...	4	...	3	...	3	1
Country Ewes.	42	100	...	18	160	92	8	3	103	57
" Ewe Lambs.	...	...	7	...	7	...	2	...	2	5
" Ram Lambs	...	...	3	...	3	...	2	1	3	Nil
Half bred Ram Lambs	...	...	...	6	6	...	...	...	...	6
" Ewe Lambs.	...	...	...	9	9	...	1	...	1	8
Hermaphrodite.	...	...	...	1	1	...	...	...	...	1
	134	108	41	57	340	122	40	49	211	129

REPORT OF THE AGRICULTURAL ENGINEERING SECTION FOR THE  
YEAR 1924-25.

*The Mysore Plough.*—A factor of supreme importance in the popularisation of any agricultural implement being its low cost, attempts were made this year to find out if ploughs can be got at a cost lower than those supplied last year. With this object in view, the Bhadravati Iron Works was approached with a request to take up the manufacture of a cheaper plough. A sample was got made and tried on the Hebbal Farm with the result that defects in certain details were noted, notwithstanding the good workmanship of the plough. They were pointed out for correction and half-a-dozen ploughs were ordered for a broader trial. These have since been received and are under test in the Government farms.

A plough after the model of the Mysore plough has been made by the Central Industrial Workshops, using the Bhadravathi pig iron and sent to the Hebbal Farm for trial. It is being tested along with the Bhadravathi plough and the English plough.

With a view to reduce the cost, an order for a larger consignment of 400 ploughs was placed with the same English firm that supplied 200 ploughs last year. The iron parts for the ploughs were received and have been fitted up with beams of local supply. The cost of each plough works at about Rs. 27 as compared with Rs. 30 on the previous order.

*Seed-drill.*—The use of seed-drill for sowing seeds is prevalent in certain parts of the State, and the indigenous implement has certain disadvantages. The question of a better type of seed-drill has been engaging the attention of the department for the last few years. A few drills were occasionally imported and modelled to suit the conditions of the land. Yet the high cost prohibited their ready adoption by the raiyats. Last year, a member of the department, Mr. Gururaja Rao, Manager, Babbur Farm, exhibited a seed-drill designed by him, at the annual gathering of the Mysore Agriculture and the Experimental Union. It was demonstrated at the Hebbal Farm and worked at the Babbur Farm in sowing a crop of jola on a field of six acres. The seeds were found to be uniformly distributed into the soil, and sown in reduced quantity for the area. It is being modelled out to sow ragi seeds as well. It is expected to cost less than the imported drills.

*Sugar-cane Mills.*—Two new types of bullock-driven mills called the Kirloskar, and the Chattanooga were tried along with an old Nahan Mill, on the Babboor Farm and a comparative statement of their work is appended. In appearance, the Chattanooga is more compact and has a better mechanical fit. In point of weight, it is about a third as heavy as each of the other two and is therefore more easily portable. The results of the short trial point to the fact that the Chattanooga Mill has given better extraction. As regards cost, it is the cheapest, the Kirloskar being cheaper than the Nahan Mill. The cost being an important point, it will find favor with the raiyats, if the mill should be equally good as regards its durability.

A mill of the Chattanooga make, but of a bigger model was tried at the Nagenhalli Farm and the report about its work gives it an advantage over the Nahan Mill, in point of extraction.

The power milling was not necessary at the Hebbal Farm and the Nagenhalli Farm, the cane having been grown on a very small area. The Babbur Farm had its canes milled through the old power mill on that farm, and the extraction was poorer by one per cent.

*Jaggory Boiling Furnaces.*—One of the problems in jaggory boiling being the economy of fuel consumption, the country furnace has, from time to time, been improved with a view to make use of what the cane crop gives as magasse and trash. A number of furnaces are in use in different parts of the State and it was decided at the Departmental Conference held last year to make a comparative study of all the furnaces recommended by the department. Five of them were erected and tried at the Babbur Farm. From the results tabulated and appended, it may be seen that the Babbur multiple furnace takes the least time and has the lowest consumption of fuel to evaporate 1,000 pounds of juice. Among the other furnaces, those for bigger pans take less time than the small pan furnaces. The Hebbal single-pan furnace which ranks next to the Babbur Furnace, in point of

fuel consumption has been found on a multiple arrangement tried with, at the Hebbal Farm, to evaporate 1,000 lbs. of juice in less time.

*Irrigation Experiments.*—The duty of water experiments on paddy were continued for the crops of the summer and rainy seasons, and the statements of results are given in the appendix. It is found this year, that irrigation whenever necessary has given the greatest yield in grain and straw during both the seasons.

As discussed in the last Departmental Conference, irrigation experiments have been started this year on the Babbur Farm for estimating the quantity of water supplied for the cane plots under spacing trials.

*Pumping Outfits.*—The Public Works Department having stopped the supply of water in the Krishnarajasagara Channels during the summer of this year, a pumping outfit was worked at the Nagenhally Farm from January, till the supply was resumed in June. A portable outfit was lent to an estate in Closepet Taluk for deepening a well, and a few outfits were placed at the disposal of the Boring Section for well work. A new type of pump called "Aquatole" was purchased and tried in Boring Section.

Applications have been occasionally received for the supply of hand pumps useful for small areas and gardens. It will be of interest to the raiyats if a few efficient types of hand pumps are fitted and demonstrated on the Farms.

*Departmental Machinery.*—It is the fifth year that the tractor is in use after its purchase. It has been working on the Babbur Farm and its functioning is intermittent. Repairs are more frequent and some times heavy. The observations made in my report on trials of tractor at Nagpur about the use of light tractor on Chitaldrug soils are borne out by the experience of the last five years. The Austin was quite inefficient to pull a two-bottom plough and if any tractor is to be introduced into that area, it should be a heavy tractor of more pulling power.

The lorry functioned without having had to do any repairs on it. It was used for the transport of paddy and other seeds in the divisions and transshipment work for other sections.

The gins on the Babbur Farm turned out work to the extent of ginning about 22,000 maunds of cotton this year. There are two gins and they are in increasing demand. An addition of two or three more gins is a suggestion from the cotton suppliers and an extension of work in that direction may be beneficial and profitable.

A 5 H. P. engine and an ensilage cutter were worked for a season on the Hebbal Farm, to fill up three pit silos, and two trench silos.

A six-horse power, cold starting Campbell oil engine was purchased for the department.

*Workshop.*—The small 6" centre treadle lathe which could not be put to use for want of a few parts, was brought to working order as funds were made available for the purchase of the parts. The agricultural implements of the Hebbal Farm and jobs for the chemical and other sections formed the items of work in the workshops. Implements for use in a few schools of the Bangalore District were made and supplied to Educational Department. Instruction in smithy and carpentry was imparted to the students of the Agricultural School. The equipment in the workshop is very little and many jobs were got done in other workshops in the City at more cost, and expenditure of time.

*Miscellaneous.*—Plans and estimates have been prepared for the various sections. A survey of the Nagenhally Farm was made as per requisition of the Deputy Director. Except repairs to the existing buildings there was not much of construction this year. The only work of construction is that of the Veterinary Hospital at Channapatna. Sanction was accorded for the construction of an Assistant's quarters at the Nagenhally Farm during the last month of the official year. Materials were collected and the construction will be started during the coming year. A few requisitions for survey and inspection of estates were received, which could not be attended to for want of time and help.

*School Work.*—As in every year, the three classes of the Agricultural School were taught in Engineering theoretical and practical. The period covered every week in actual instruction, was 21 hours, omitting the time needed for preparation



as well as arrangement for the practical work. This is as much as, if not more than, what a full time officer is appointed to do in educational institutions. I have been emphasising the need of an Assistant, the post of whom having been sanctioned some years back, was disallowed later on. I have pointed out in my previous reports, and do so again that this has been a handicap on my legitimate work and has not been permitting me to give a sustained effort to any agricultural problem.

*Staff.*—The staff was the same in strength as in the previous year; a part of it continued temporarily. An Agricultural Inspector was placed at my disposal for one month to assist me in the jaggory furnace trials. One mechanic was in full time duty attending to fittings and repairs in the Chemical Laboratory.

*Tour.*—I was on tour for 31 days. The periods for which my staff was on tour are as recorded below:—

Mechanic	...	...	...	...	95
Draftsman	...	...	...	...	62
Carpenter	...	...	...	...	9
Lorry Driver	...	...	...	...	85
Smith	...	...	...	...	34
Engine Driver	...	...	...	...	66
Engine Driver	...	...	...	...	37
Asst. Mechanic	...	...	...	...	74

M. G. SINGARACHAR,

*Agricultural Engineer.*

#### Trials of Sugar-cane Mills (Bullock-driven).

Type of mill	Weight of Mill in lbs.	Weight of cane milled out in lbs.	Weight of juice extracted in lbs.	per cent of extraction	Time taken in minutes	Output per Hr.	Pull in lbs.	Average pull in lbs.
Chattanooga	370	200	126	63	40	300	125 to 178	152
Do	..	200	126	63	45	266	150 to 180	165
Kirloskar	892	200	123	61.5	43	279	133 to 180	157
Do	..	200	123	61.5	45	266	145 to 180	163
Nahan (old Mill)	912	200	122	61	45	266	141 to 225	183

#### Hebbal Furnace.

Date	Wt. of juice in lbs.	Time taken in hrs.	Wt. of fuel in lbs.	Time taken to boil 1,000 lbs. of juice	Wt. of fuel used to boil 1,000 lbs. of juice
3-3-25	205	2½	123	11'0	600
"	205	2½	110	11'0	537
4-3-25	410	5½	201	14'2	490
"	410	4	159	9'8	388
5-3-25	410	3	180	7'3	439
"	410	4	176	9'8	429
6-3-25	410	3	180	7'3	439

#### BABBUR THREE-PAN FURNACE.

27-1-25	901	4½	482	4'7	535
"	938	2 hrs. 40'	290	2'8	309
"	905	2	256	2'2	283
29-1-25	861	5½	468	6'7	544
"	902	2½	299	3'0	331
"	902	2½	264	2'5	293
19-2-25	943	4	498	4'2	528
"	943	2½	303	2'7	321
"	943	2½	262	2'4	278

## Coimbatore Medium Furnace.

Date	Wt. of juice boiled in lbs.	Time taken in hrs.	Wt. of fuel in lbs.	Time taken to boil 1,000 lbs. of juice	Wt. of fuel to boil used 1,000 lbs. of juice
26-1-25	701	5 hrs. 5'	564	7'3	805
"	813	4½	534	5'5	657
"	843	3 hrs. 33'	418	4'2	496
23-1-25	984	5	493	5'1	501
"	984	4	545	4'0	554
4-2-25	1,025	4½	507	4'1	495
"	1,025	3½	492	3'2	480
8-2-25	738	4½	498	5'8	675
15-2-25	697	4	404	5'7	581
17-2-25	984	3½	414	3'6	421

## COUNTRY FURNACE.

25-1-25	449	5 hrs. 20'	684	11'8	1,523
1-2-25	492	4½	656	9'7	1,333
2-2-25	410	4½	580	10'4	1,410
9-2-25	656	4½	696	6'5	1,061
16-2-25	615	4½	575	6'9	935
"	615	3½	543	5'7	883
20-2-25	574	3½	505	6'5	880
5-3-25	410	1 hr. 50'	249	4'5	607

## BIG ROUND PAN FURNACE.

26-1-25	873	4	530	4'6	607
"	1,075	4½	562	4'0	523
"	1,198	2 hrs. 50'	480	2'4	401
23-1-25	1,066	4 hrs. 50'	566	4'5	531
"	1,025	4½	525	4'1	512
3-2-25	984	3½	527	3'8	532
"	1,066	4	495	3'8	474
8-2-25	820	4½	477	5'2	582
15-2-25	943	½	479	4'2	508
17-2-25	1,107	3½	462	2'9	417
3-3-25	984	3½	455	3'8	462
4-3-25	1,066	4 hrs. 10'	600	3'9	560

## Abstract of Results of Furnace Trials.

Kind of furnace	Time taken to boil 1,000 lbs of juice	Weight of fuel, used in boiling 1,000 lbs. of juice
Babbur Furnace	3'8 hrs.	380 lbs.
Hebbal "	8'6 "	423 "
Coimbatore,,	4'9 "	567 "
Country "	7'8 "	1,079 "
Big Round-pan Furnace	3'9 "	509 "

## DUTY OF WATER EXPERIMENTS.

## SUMMER CROP.

Transplanted on 6-2-1925.

Harvested on 30-5-1925.

No. of plot	No. of irrigation	Acre inches of irrigation	Rainfall	Total supply in acre inches	Yield grain	In straw	Remarks
1	59	161'07	7'92	168'99	48	92	
2	20	54'60	7'92	62'52	53	72	
3	21	84'63	7'92	92'55	64	89	1 2 3
4	31	84'63	7'92	92'55	42	70	4 5 6
5	43	117'39	7'92	125'31	66	94	7 8 9
6	20	54'60	7'92	62'52	70	70	
7	20	54'60	7'92	62'52	45	46	
8	31	84'63	7'92	92'55	58	85	
9	42	114'66	7'92	122'58	78	112	

## WINTER CROP.

Transplanted on 7-8-1924.

Harvested on 8-12-1924.

No. of plot	No. of irrigation	Acre inches of irrigation	Rainfall	Total supply in acre inches	Yield grain	In straw	Remarks
1	67	182'99	13'42	196'33	120	132	
2	19	51'87	13'42	65'29	102½	108	
3	34	92'82	13'42	106'24	107	130	
4	34	92'82	13'42	106'24	98½	106	
5	48	131'04	13'42	144'46	122	114	
6	19	51'87	13'42	65'29	113	126	
7	19	51'87	13'42	65'29	105	130	
8	34	92'82	13'42	106'24	117	130	
9	44	120'12	13'42	133'54	119	130	

1, 5, 9 whenever necessary  
 3, 4, 8 once in 3 days  
 2, 6, 7 once in 5 days

## Average Results of Expenditure on the duty of water in Paddy.

Particulars of irrigation	Winter		Summer	
	Yield per acre for 23-24		Yield per acre for 24-25	
	Grain	Straw	Grain	Straw
Irrigation whenever necessary	1,920	2,980	3,610	3,760
„ once in three days	1,640	2,440	3,230	3,660
„ once in five days	1,680	1,880	3,210	3,640

ANNUAL REPORT OF THE CENTRAL IMPLEMENT DEPOT  
FOR THE YEAR 1924-25.

There was no change in the working of the Depot. As was anticipated last year, the Mysore plough came to be greatly appreciated by the agriculturists. To meet the increasing demand, 400 ploughs were got manufactured in England for this department, in addition to another hundred for the United Provinces. As a result of the large order, we were able to secure an appreciable reduction in the cost of the implement and fix the selling price at Rs. 3 less than in the previous year. As the imprest on hand was low and payment had to be made for the above consignment, a special advance of Rs 3,300 was sanctioned in Government Order No. I. C. 1122-3—A. & E. 2-24-4, dated 20th August 1924, to be adjusted from the sale proceeds of the articles. A sum of Rs. 1,335 has up to now been remitted to the Treasury in adjustment of this advance.

The Depot has, as usual, turned out a considerable volume of business. Implements of the value of Rs. 953-12-0 were issued on the hire-purchase system during Agri.

the year, as against Rs. 412-1-0 during the previous year. The total amount of receipt was Rs. 65,221-13-2, consisting of Rs. 42,448-3-2 in cash and Rs. 22,773-10-0 by transfer.

The following statement shows the expenditure incurred on the purchase of stock and the sources from which it was obtained:—

Serial No.	Name of the firm	Amount disbursed	
		Rs.	a p..
1	The Kolar Mission Institute, Kolar	11,308	10 0
2	Messrs. Jessop & Co., Madras	9,021	8 0
3	Messrs. Kirloskar Bros., Kirloskarvadi	8,131	5 0
4	Messrs. Massey Harris & Co., Canada	7,699	6 0
5	The Nahan Foundry, Punjab	6,389	7 0
6	The Central Industrial workshop, Bangalore	1,000	0 0
7	The Agricultural Engineer, Bangalore	403	3 0
8	Messrs. Madurai Moodaliar & Sons, Bangalore	230	0 0
9	Messrs. V. Baboo Sahib & Co., Bangalore Cantonment	71	1 0
10	Messrs. K. K. Abdul Azeez & Sons, Bangalore	26	9 0
11	Messrs. S. Khader Beig Sab & Co., Bangalore	5	8 0
	Total	44,266	9 0

As was reported last year, the system of maintaining accounts in the Depot is undergoing revision with a view to reduce clerical work by adopting forms which, while being less elaborate, should still give all the necessary information.

The usual financial statements for the year are appended.

H. V. KRISHNAYYA,  
For *Director of Agriculture.*

TABLE I.

Items	Outstanding on 1st July 1924			Issues in 1924-25			Total
	Depots	Parties	Total	Depots	Parties	Total	Depots
1	2	3	4	5	6	7	8
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Bangalore (Credit sales) ... ..	8,492 6 4	3,525 13 1	12,018 3 5	8,654 1 4	767 13 6	9,421 14 10	17,146 7 8
Mysore do ... ..	4,174 15 9	1,648 0 9	5,823 0 6	6,728 7 4	140 10 0	6,869 1 4	10,903 7 1
Tumkur do ... ..	5,720 5 8	430 14 5	6,151 4 1	3,204 6 1	23 5 0	3,317 11 1	9,014 11 9
Kolar do ... ..	13,743 13 11	533 8 10	14,277 6 9	5,164 6 0	292 9 5	5,456 15 5	18,908 3 11
Shimoga do ... ..	5,530 8 11	926 6 1	6,456 10 0	6,724 1 0	.....	6,724 1 0	12,254 4 11
Hassan do ... ..	2,262 8 5	764 1 2	3,026 9 7	1,291 9 3	65 10 6	1,356 10 9	3,553 8 8
Kadur do ... ..	2,418 0 10	97 9 4	2,515 10 2	2,620 10 1	.....	2,620 10 1	5,098 10 11
Chitaldrug do ... ..	8,425 6 7	1,001 0 1	9,426 6 8	13,991 12 0	.....	13,991 12 0	22,417 2 7
Outside the Province ... ..	.....	352 9 6	352 9 6	.....	1,974 3 6	1,974 3 6	.....
<b>Total</b> ... ..	<b>50,767 13 5</b>	<b>9,279 15 3</b>	<b>60,047 12 8</b>	<b>48,468 12 1</b>	<b>3,264 3 11</b>	<b>51,733 0 0</b>	<b>99,236 9 6</b>
Issues on hire-purchase system ... ..	.....	3,965 9 2	3,965 9 2	.....	953 12 0	953 12 0	.....
Cash sales ... ..	.....	.....	.....	.....	354 10 0	354 10 0	.....
<b>Grand Total</b> ... ..	<b>50,767 13 5</b>	<b>13,245 8 5</b>	<b>64,013 5 10</b>	<b>48,468 12 1</b>	<b>4,576 9 11</b>	<b>53,045 6 0</b>	<b>99,236 9 6</b>
Deduct value of stock in all depots ... ..	37,455 6 1	.....	37,455 6 1	.....	.....	.....	37,455 6 1
<b>Balance outstanding</b> ... ..	<b>13,312 7 4</b>	<b>13,245 8 5</b>	<b>26,557 15 9</b>	<b>48,468 12 1</b>	<b>4,576 9 11</b>	<b>53,045 6 0</b>	<b>61,781 3 5</b>

Items	dues		Collections in 1924-25			Outstanding at the end of June 1925		
	Parties	Total	Depots	Parties	Total	Depots	Parties	Total
	9	10	11	12	13	14	15	16
	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Bangalore (Credit sales) ... ..	4,993 10 7	21,440 2 3	10,207 8 10	2,618 7 3	12,826 0 1	6,988 14 10	1,675 3 4	8,614 2 2
Mysore do ... ..	1,788 10 9	12,692 1 10	5,190 1 9	1,357 0 9	6,547 2 6	5,713 5 4	431 10 0	6,144 15 4
Tumkur do ... ..	454 3 5	9,468 15 2	3,581 6 7	226 7 9	3,807 14 4	5,433 5 2	127 11 8	5,661 0 10
Kolar do ... ..	826 2 3	19,734 6 2	9,623 14 11	243 14 1	9,866 13 0	9,285 5 0	582 4 2	9,867 9 2
Shimoga do ... ..	926 6 1	13,180 11 0	6,512 10 1	476 0 1	6,988 10 2	5,741 10 10	450 6 0	6,192 0 10
Hassan do ... ..	829 11 8	4,383 4 4	1,172 13 11	208 12 5	1,381 10 4	2,380 10 9	620 15 3	3,001 10 0
Kadur do ... ..	97 9 4	5,136 4 3	2,840 1 0	20 11 1	2,860 12 1	2,198 9 11	76 14 3	2,275 3 2
Chitaldrug do ... ..	1,001 0 1	23,418 2 8	16,400 12 10	913 10 9	17,314 7 7	6,016 5 9	87 5 4	6,103 11 1
Outside the Province ... ..	2,326 13 0	2,326 13 0	.....	1,632 6 6	1,632 6 6	.....	694 6 6	694 6 6
<b>Total</b> ... ..	<b>12,544 3 2</b>	<b>1,11,783 12 8</b>	<b>55,528 5 11</b>	<b>7,697 6 8</b>	<b>63,225 12 7</b>	<b>43,708 3 7</b>	<b>4,846 12 6</b>	<b>48,555 0 1</b>
Issues on hire-purchase system ... ..	4,919 5 2	4,919 5 2	.....	1,637 6 7	1,637 6 7	.....	3,281 14 7	3,281 14 7
Cash sales ... ..	358 10 0	358 10 0	.....	358 10 0	358 10 0	.....	.....	.....
<b>Grand Total</b> ... ..	<b>17,822 2 4</b>	<b>1,17,058 11 10</b>	<b>55,528 5 11</b>	<b>9,693 7 3</b>	<b>65,221 13 2</b>	<b>43,708 3 7</b>	<b>8,128 11 1</b>	<b>51,836 14 8</b>
Deduct value of stock in all depots ... ..	.....	37,455 6 1	Rs. 7,059-9-10 is included in the total column of Rs. 65,221-13-2			30,895 12 3	.....	30,895 12 3
<b>Balance outstanding</b> ... ..	<b>17,822 2 4</b>	<b>79,603 5 9</b>	.....	.....	.....	<b>13,312 7 4</b>	<b>8,128 11 1</b>	<b>441 2 5</b>

TABLE II.

Serial No.	Names of Districts	Serial No.	Names of Districts
1	Bangalore	1	Bangalore
2	Mysore	2	Mysore
3	Tumkur	3	Tumkur
4	Kolar	4	Kolar
5	Shimoga	5	Shimoga
6	Hassan	6	Hassan
7	Kadur	7	Kadur
8	Chitaldrug	8	Chitaldrug
9	Outside the Province	9	Outside the Province
	Total		Total
	50		46
	85		74
	12		52
	200		12
	42		184
	22		162
	87		37
	21		26
	23		27
	3		230
	6		18
	17		51
	4		529
	171		51
	17		284
	70		51
	25		11
	11		2
	1		20
	25		18
	82		27
	26		21
	60		102
	60		72
	24		48
	60		95
	8		18
	8		156
	4		1,000
			175
			102
			19
			86
			12
			18
			144
			1,000
			175

## REPORT OF WORK DONE IN THE WELL BORING SECTION DURING 1924-25.

*Starting of the Well Boring Section.*—This section was newly added to the Agricultural Department as per G. O. No. I. C. 7679-742—A. & E. 132-23-7, dated 18th June 1924.

*Appointment of the Well Boring Engineer and Executive Staff.*—Till the 6th February 1925, this section was being worked with only one Inspector and one helper, when the undersigned took charge of this section as Boring Engineer as per G. O. No. I. C. 5279819—A. & E. 133-27-18 of 30th January 1925. The major portion of the staff reported themselves for duty early in April. At present, the executive staff consists of one Boring Inspector on Rs. 100, 3 Boring Operators on Rs. 75, one smith on Rs. 50, one Engine Driver on Rs. 40, and one helper on Rs. 30 in addition to one Bellows Boy and one Hammer man.

*Tools and Plant.*—Till the end of December 1924, the section possessed only one Mustos' Boring Plant. The boring plants belonging to Tumkur and Shimoga District Boards were taken in January and February, 1925 respectively. The plant belonging to Shimoga District Board was taken over to Bangalore to supply the missing parts and get it into working order. As there were only three worn chisels, orders were placed in March for a set of boring tools with Messrs. Richardson & Cruddas of Bombay, and till the end of June only one boring bit and four wrenches were received. The boring bit was sent to Davangere as it was urgently required there. The wrenches will be of no use till the complete set of tools is received.

In addition to the boring plant, the department is in possession of one Roturbo Centrifugal Pump and one Aquatole water-lift received during the early part of April 1925.

Two Myers Pumps were also received from Bombay during the latter part of May 1925, and one has already been sent to Davangere for testing the water capacity of the bore.

*Help rendered.*—During the year under report, 16 borings have been executed and blasting has been done in 4 wells and the pumping outfits have been lent to persons for unwatering purposes in deepening wells.

*Work at Davangere and Maddagiri.*—The work at Davangere has prolonged for a longer time than was expected on account of the inefficiency and the oldness of the tools, and the work at Maddagiri cannot be taken up on account of the conservative nature of the people and it is intended to have a trial bore in one of the abandoned public wells at Government cost to find out to what depth the rock bed extends.

*Tours.*—The Engineer toured for 40 days, personally inspected one dozen wells and gave necessary advice.

*Conclusion.*—Taking the general condition of the tools at hand and the newness of the staff for this kind of work it may be said that the work has been done quite satisfactorily. It is expected to show better results when all the tools have arrived during next official year.

H. V. VISVESVARAYYA,  
Well Boring Engineer.