

Department of Agriculture, Bombay.

BULLETIN No. 55 OF 1913.

AN EXAMINATION OF THE SEED SUPPLY OF THE
POONA DISTRICT.

PART I.— Seed Supply of Villages near Poona (Kharif Season, 1912).

PART II.— Seed Supply of the Poona District (Rabi Season, 1912).

From the Seed Testing Department, Agricultural College, Poona.



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PART I.

SEED SUPPLY OF VILLAGES NEAR POONA.

(KHARIF SEASON, 1912.)

INTRODUCTION.

During the Kharif season of 1912 an attempt was made to test the quality of seeds of important crops obtained in the Poona Bazár and in neighbouring villages. The villages from which samples were obtained were Dápodi, Bopodi, Aundh, Pimpal Nilakh, Yerandavna, and Kothrud all in the Haveli Táluka. For the sake of comparison the results of the examination of certain samples from the College Farm, Poona, are also given. In all 130 samples were examined, of which 67 came from the villages, 31 from the shops, and 32 from the College Farm.

The cultivators in the above villages as a rule preserve their own seed. In Aundh, since the rains were late many cultivators used for eating purposes the seed so stored and had to obtain seed at a high price from neighbouring villages. Recourse is seldom had to Vani shop-keepers for seed.

In Kothrud and Yerandavna horticulture especially fruit-growing (Guavas, etc.) is practised more than agriculture proper.

The samples of seeds here reported on were from the actual bulk that was being sown on each cultivator's land, as the visits were timed for the sowing season. The chief crops were Bájri and Nilva Jowár and among pulses, Tur.

Results of examinations.—Nilva Jowár (*Andropogon Sorghum*).

Average percentages.

Sources or name of village.	Number of samples.	Purity.	Germination.	Useful seed.
Villages	16	93'23	82'0	77'4
Agricultural College Farm	2	93'5	98'1	91'6
Poona Bazár	2	99'1	88'2	87'4

Five samples out of the 16 village samples were attacked by weevils. Three of them contained the weed seeds of *Alysicarpus rugosus* and *Ipomæa eriocarpa* which are said to be most noxious weeds. There was no weevil attack nor any weed seed in the samples from the Bazár and the College Farm. The germination percentage of the seeds from the villages is very low. As regards useful seed they are 10 per cent. less than the Bazár seeds, and about 14 per cent. less than the College Farm seeds. Of the 16 samples examined :—

2	gave between	40 and	50	per cent. of useful seeds.
2	"	50 and	60	" "
1	"	60 and	70	" "
2	"	70 and	80	" "
4	"	80 and	90	" "
5	"	90 and	100	" "

Thus more than 43 per cent. of the samples show less than 80 per cent. of useful seed. The samples from the Agricultural College Farm and Poona Bazár gave a useful seed percentage of between 90 and 100; two samples of each were examined.

Bájrí (*Pennisetum typhoideum*).—19 samples were examined with the following results :—

Average percentages.

Source.	Number of samples.	Purity.	Germination.	Useful seed.
Villages	19	89.9	85.1	81.3
Agricultural College Farm	5	97.5	94.9	92.1
Poona Bazár	2	98.8	95.8	94.7

There was no weevil attack found in these samples; three samples contained weed seeds, namely, *Commelina Forskalii*, which is a common in Bájrí fields, *Celosia argentea*, *Alysicarpus rugosus* and *Indigofera glandulosa*. The useful seed in the village samples is about 11 per cent. less than in the College Farm samples and about 12 per cent. less than in the Poona Bazár samples. There was no weevil attack nor was there any weed seeds in the samples from the Poona Bazár and the Agricultural College Farm. Out of the 19 village samples examined—

3	gave between	60 and	70	per cent. of useful seed.
4	"	70 and	80	" "
10	"	80 and	90	" "
3	"	90 and	100	" "

So about 36 per cent. of the samples gave less than 80 per cent. of useful seed. Now out of 7 samples examined from Agricultural College Farm and Poona Bazar 1 gave between 80 and 100 and the remaining 6 gave between 90 and 100 per cent. of useful seed.

Leguminous Crops.

The villages grow pulses to a considerable extent especially Tur (*Cajanus indicus*) of which 13 samples were examined with the following results :—

Average percentages.

Source.	Number of samples.	Purity.	Germination.	Useful seed.
Villages	13	87.2	84.6	70.9
Agricultural College Farm	1	92.1	83.5	76.5

Every one of the 13 villages samples examined was attacked by weevils. Eight of them contained seeds of *Ipomæa eriocarpa* in large quantities, five of them having from 2 to 4 per cent. of those weed seeds and the remaining three a little less, with a few seeds of *Alysicarpus rugosus* as well. Germination and useful seed per cent. was greatly reduced by weevil attack as well as by the presence of weed seeds in such large quantities. The one sample of the same, examined from the Agricultural College Farm, was found to be free from any weevil attack and weed seeds. Its useful seed per cent. was 76.5. While of 13 from the villages examined—

1 gave between 30 and 40 per cent. of useful seed.

1 " 50 and 60 " "

2 " 60 and 70 " "

4 " 70 and 80 " "

5 " 80 and 90 " "

Udid (Phaseolus radiatus).—Four samples were examined and the results are as follows :—

Average percentages.

Source.	Number of samples.	Purity.	Germination.	Useful seed.
Villages	4	82.0	56.0	43.5
Agricultural Farm	1	86.0	80.0	68.5
Poona Bazar	2	91.9	95.4	87.7

All of the four samples from the villages examined were more or less attacked by weevils. There was no weevil attack in the Poona Bazár sample but the sample from the College Farm was attacked. None of these samples contained weed seeds nor hard seeds, which are sometimes found in this crop. The average useful seed in the village seed is only 43·5 per cent. One of the samples did not germinate at all. One gave its useful seed per cent. between 30 and 40, one between 60 and 70 and one between 70 and 80 per cent.

The one sample of the same examined from the College Farm gave between 60 and 70 useful per cent. ; this result is also poor. But two examined from Poona Bazár gave satisfactory results.

There were no samples of Mug (*Phaseolus mungo*) from the villages ; but one was examined from the College Farm and two from Poona Bazár with the following results :—

Source.			Number of samples.	Purity.	Germination.	Useful seed.
Agricultural College Farm	...	...	1	98·9	87·5	86·5
Poona Bazár	...	...	2	96·4	96·2	92·5

One of the Poona Bazár samples was slightly attacked by weevil ; but no weed seeds were found in any of these. There were no hard seeds. Their germination and useful seed per cent. were satisfactory.

Pavta (Dolichos lablab).—One village sample of Pavta was examined and four samples from Poona Bazár, the results are as follows :—

Average percentage.

Source.			Number of samples.	Purity.	Germination.	Useful seed.
Villages	...	...	1	98·5	77·0	75·8
Poona Bazár	...	...	4	94·6	85·7	81·2

The Pavta sample examined from the village was attacked by weevil. The samples examined from the Poona Bazár were quite free from weevil attack. There were no weed seeds in all these.

Four samples from Poona Bazar showed their useful seed per cent. as follows :—

1	gave between	60 and	70 per cent.
2	„	80 and	90 „
1	„	90 and	100 „

Vál (Dolichos lablab Variety).—One sample of Vál was also examined from the villages. Its purity per cent. was 98·6, germination per cent. was 54·0 and useful seed per cent. was 53·2. It was badly attacked by weevils. Some seeds were entirely hollowed out and every seed was more or less attacked. Hence its impurity weighed 46·8 and its germination was impaired. There were no weed seeds found in the sample.

Hulga (Dolichos biflorus).—One sample each from villages, College Farm and Poona Bazar, was examined and the following results obtained :—

Average percentage.

Source.	Number of samples.	Purity.	Germination.	Useful seed.
Villages	1	97·6	97·5	95·1
Agricultural College Farm	1	90·0	96·9	87·2
Poona Bazar	1	93·4	90·5	84·5

The Hulga sample from Poona Bazar was attacked by weevils the rest were not. None of them contained weed seeds. In this case only the village sample is higher in germination and useful seed percentage than the other two.

The pulse seeds of Chavali (*Vigna catieng*), Matki (*Phaseolus aconitifolius*), and Gram (*Cicer arietinum*), were not obtained from any of the villages nor from Agricultural College Farm but all these three were obtained in Poona Bazar the results were :—

Average percentage.

Source.	Number of samples.	Purity.	Germination.	Useful seed.
Chavali	2	97·5	89·5	87·0
Matki	2	95·9	95·2	91·4
Gram	1	98·1	98·0	96·1

Two of the Matki samples contained the weed seed of *Alysicarpus rugosus*, *Crotalaria orissensis* and *Commelina Forskalii*.

One sample of Matki was attacked by weevils.

The sample of Gram was free from weevil attack and weed seed.

Rala (Setaria italica).—One sample of Rala from the villages, one from Poona Bazár and one from the Agricultural College Farm, were examined and the results were :—

Average percentage.

Source.	Number of samples.	Purity.	Germination.	Useful seed.
Villages	1	99.3	57.7	57.2
Agricultural College Farm	1	99.8	99.0	97.8
Poona Bazár	1	99.7	61.7	61.5

The useful seed percentage of the village samples and Poona Bazár samples is very low.

Chillies (Capsicum annum).—Two samples of chillies were examined, one from Poona Bazár and one from the Agricultural College Farm :—

Source.	Number of samples.	Purity.	Germination.	Useful seed.
Agricultural College Farm	1	75.0	97.6	73.2
Poona Bazár	1	86.0	92.7	79.2

No weed seeds were found in any of these.

Fibre crops.—Ambadi (*Hibiscus cannabinus*) or the Deccan hemp is the only fibre crop of which seeds were obtained in the villages.

The average purity per cent. was 74.5, germination 67.8, and useful seed 51.9 per cent. This is very poor. All of these gave their useful seed percentage between 50 and 53. Three of these were attacked by weevils; and also contained the weed seeds of *Ipomœa eriocarpa* from 18 to 26 seeds in 100 grains total seed.

Oil-seed crops—Niger seed (Guizotia abyssinica).—Six samples were obtained in the villages and one in the Agricultural College Farm. The results are as follows :—

Average percentage.

Source.	Number of samples.	Germination.	Purity.	Useful seed.
Villages	6	86.9	76.7	69.9
Agricultural College Farm	1	95.0	88.7	84.2

The useful percentage of the samples from villages is very low—

1	gave between	30 and	40	useful seed	per cent.
2	„	50 and	60	„	„
2	„	80 and	90	„	„
1	„	90 and	100	„	„

All the samples of Niger seed including the one sample from the College Farm contained weed seeds of different sorts, namely, *Indigofera glandulosa*, *Cleome viscosa*, *Commelina Forskalii*, *Sida spinosa*, *Blainvillea latifolia*, *Ipomœa eriocarpa*, *Spermacoce stricta* and *Spermacoce hispida*, *Panicum Isachne*, and *Lavandula Burmanni*.

Safflower (Carthamus tinctorius).—One sample mixed with Shapu (*Fœniculum vulgare*) was obtained in one village, its germination was very poor. It gave purity per cent. 81.5 germination 47 and useful seed 38 per cent. This low result was obtained because the Shapu, which was mixed with the safflower, failed to germinate, only 47 seeds out of 50 of safflower germinated.

Ground-nut (Arachis hypogea).—One sample of country ground-nut was obtained in the village and its examination gave the following results :—

Purity.	Germination.	Useful seed.
100	95.9	95.0

PART II.

SEED SUPPLY OF THE POONA DISTRICT.

(RABI SEASON, 1912.)

The seeds for this series of tests were collected from the following villages :—

Taluka.	Village.	Number of samples collected.
Junnar	Junnar	19
Do.	Naráyangaon	26
Do.	Ranjni	13
Haveli	Shelarwádi	19
Do.	Hadapsar	8
Do.	Chinchvad	4
Do.	Bopodi	4
Sirur	Sirur	9
Do.	Shikárpur	11
Do.	Ahmedabad	3
Do.	Hivrah	6
Dhond	Dhond	16
Do.	Pátas	15
Indápur	Indápur	24
Do.	Diksal	7
Do.	Bhigvan	1
Mával	Khadkála	9
Do.	Karla	6
Do.	Talegaon	41
Khed	Khed	3
Do.	Chakan	40
Bhimthadi	Barámati	25

The time of collection was the sowing time for the rabi (*i. e.*, cold weather season). This was after the rains in the months of November and December 1913. The total number of samples collected was 309. The samples were mostly taken from stored seed. Some were collected from bulk that was being sown on the cultivators' land.

1.—Wheat (*Triticum species*).

Ninety-four samples were collected. The average percentage of useful seed in these was higher than anything we have previously found in Ahmednagar or Broach districts. The results are given below with the Broach and Ahmednagar figures for comparison :—

Year.	District.	Number of samples examined.	Average purity per cent.	Average Germination per cent.	Average useful seed per cent.
1912	Poona	94	98.2	95.5	93.7
1911	Ahmednagar	126	96.3	92.5	89.1
1910	Broach	43	95.2	83.4	79.4

It will be noticed that the superiority is both in purity and germination percentage.

Nineteen samples were attacked by weevils, but the attack was slight. Seven samples contained small amounts of weed seeds, mostly dead. Of the 94 samples examined—

2	gave between 50 and 60 per cent. useful seed.
3	" 70 and 80 " "
6	" 80 and 90 " "
83	" 90 and 100 " "

In comparison with this last figure, in the case of Ahmednagar, only 90 out of 132 samples gave between 90 and 100 per cent.

2.—Shalu Fowár (*Andropogon sorghum*).

This is the most important cereal crop of the district. Sixty-eight samples were examined. Of these twenty-seven were badly attacked by weevils and the germination percentage accordingly reduced. Partly on this account the percentage of useful seed is lower than in the case of Ahmednagar and Broach. Results :—

Year.	District.	Number of samples examined.	Average purity per cent.	Average Germination per cent.	Average useful seed per cent.
1912	Poona	68	96.8	73.8	71.6
1911	Ahmednagar	99	97.8	77.2	75.3
1910	Broach	70	97.1	83.5	80.0

No weed seeds were found.

Of the sixty-eight samples—

1 did not germinate at all.

1	gave between	10 and	20 per cent.	useful seed.
4	"	40 and	50	" "
4	"	50 and	60	" "
18	"	60 and	70	" "
15	"	70 and	80	" "
21	"	80 and	90	" "
4	"	90 and	100	" "

It will be seen that no less than 40 per cent. of the samples gave less than 70 per cent. useful seed. This is a very bad result for such an important crop.

Gram (Cicer arietinum).

This is an important pulse crop. Seventy samples were examined. Nine of these were attacked by weevils. The results are practically the same as those of Ahmednagar :—

Year.	District.	Number of samples examined.	Average purity per cent.	Average Germination per cent.	Useful seed percentage
1912	Poona	70	98.2	91.6	90.4
1911	Ahmednagar	52	97	93	90.2

No weed seeds were found, and impurities were merely dirt. Out of the 70 samples—

1	gave between	20 and	30 per cent.	useful seed.
1	"	50 and	60	" "
4	"	60 and	70	" "
4	"	70 and	80	" "
9	"	80 and	90	" "
51	"	90 and	100	" "

The sample which gave between 20 and 30 per cent was from a "Penv" where the seeds had got mouldy.

On the whole the results for this crop are fairly good, though by no means ideal.

Watána (Peas) (Pisum sativum).

Four samples were examined. Two samples were attacked by weevils and these were white seeds. The other two were black.

Results :—

Average purity percentage.	Average germination percentage.	Average useful seed percentage.
95·4	94·7	90·3

This is good.

Wál (Dolichos lablab).

Two samples were examined. One was very badly attacked by weevils. Its results are—

	Average purity percentage.	Average germination percentage.	Average useful seed percentage.
The attacked one gave ...	97·8	30·5	29·8
The other gave ...	99·5	86·0	85·5

General average ... 57·6

The average of the 12 Broach samples examined in 1910 was 62·5 and in these samples there was over 40 per cent. of hard seed. No hard seed was found in the Poona samples.

Kardai (Safflower) (Carthamus tinctorius).

Twenty-nine samples were examined. There was no weevil attacked or admixture with weed seeds. A few samples contained Mohori (mustard) seeds. Results compared with those of Ahmednagar :—

Year.	Source.	Number of samples examined.	Average purity per cent.	Average Germination per cent.	Average useful seed per cent.
1912	Poona	29	85·4	80·0	77·1
1911	Ahmednagar	73	93·2	87·5	81·5

Of the 29 samples—

1	gave between 20 and 30 per cent. useful seed.
3	" 40 and 50 "
2	" 60 and 70 "
3	" 70 and 80 "
15	" 80 and 90 "
5	" 90 and 100 "

This is only fair.

Linseed (Linum usitatissimum).

Eight samples were examined. One of these contained weeds seeds of *Ipomæa eriocarpa*.

Results are compared with Ahmednagar results:—

Year.	District.	Number of samples examined.	Average purity percentage.	Average Germination percentage.	Useful seed percentage.
1912	Poona	8	97.1	96.5	93.5
1911	Ahmednagar	16	96.9	92.1	89.2

Of the samples—

1 gave between 80 and 90 useful seed.

7 " " 90 and 100 " "

There was no weevil attack.

Satu (Barley) (Hordeum vulgare).

Four samples were examined. One was attacked by weevils and gave only 67.4 useful seed.

Results—

Purity.	Germination.	Useful seed.
94.3	94.2	86.9

Fai (Oats) (Avena sativa).

One sample was examined (from Pátas).

Results—

Purity percentage.	Germination percentage.	Useful seed percentage.
99.6	95.5	95.1

Mohori (Black Mustard) (Brassica nigra).

Two samples were examined. One contained weeds seeds as follows:—

2 seeds *Sesbania aculeata*.

3 " *Ipomæa eriocarpa*.

1 seed *Indigofera glandulosa*.

Results—

Purity.	Germination.	Useful seed.
92.3	70.1	84.8

Methi (Fenugreek) (Trigonella fœnum græcum).

Three samples were examined. One contained a few Mohori seeds.

Results—

Average purity percentage.	Average Germination percentage.	Average useful seed percentage.
98.4	64.6	63.6

Maka (Maize) (Zea mays).

One sample was examined. It was attacked by weevils.

Results—

Purity percentage.	Germination percentage.	Useful seed percentage.
94.5	79.5	75.1

Rajgira (Amarantus paniculatus).

One sample was examined. It contained a good deal of jowar seed.

Results—

Purity percentage.	Germination percentage.	Useful seed percentage.
74.5	85.0	63.3

Summary of useful seed percentages.

Crop.	Villages near Poona Kharif seed, 1912.	Poona District Rabi seed, 1912.	Agricultural College Farm Kharif seed, 1912.	Poona Bazar, 1912.	Ahmed-nagar District Rabi seed, 1910.	Broach District, 1910.	Ahmed-nagar District Kharif seed, 1911.	Broach District Kharif seed, 1911.	Average for crops.
<i>Cereals.</i>									
Nilwa Jowár ...	77.4	...	91.6	87.4	...	...	83.4	72.7	82.5
Shalu Jowár ...	...	71.6	...	...	75.3	80.0	...	...	75.6
Bájrí ...	81.3	...	92.1	94.7	81.9	85.5	84.1	75.4	85.0
Wheat ...	...	93.7	...	...	89.1	79.4	93.3	...	88.8
Oats ...	...	95.1	...	...	...	...	...	...	95.1
Maize ...	...	75.1	...	...	...	...	...	...	75.1
Rala ...	57.2	...	97.8	61.5	85.5	85.5	88.9	...	79.4
Barley ...	...	86.9	...	...	74.8	...	...	...	80.8
<i>Pulses.</i>									
Gram ...	...	90.4	...	96.1	90.2	98.2	85.2	98.2	93.0
Watána ...	...	90.3	...	...	...	...	...	...	90.3
Wál ...	53.2	57.6	...	...	...	...	...	...	55.4
Tur ...	70.9	...	76.5	...	73.0	81.1	85.7	76.1	77.2
Udid ...	43.5	...	68.5	87.7	...	...	76.6	90.9	73.4
Mug ...	...	...	86.5	92.5	...	...	88.6	81.9	87.3
Pavata ...	75.8	...	...	81.2	...	...	89.6	72.3	79.7
Hulga ...	95.1	...	87.2	84.5	...	...	...	...	88.9
Chavali ...	...	...	...	87	65.9	71.6	88.2	91.1	79.4
Matki ...	...	...	...	91.4	...	...	...	...	91.4
Groundnut ...	95	...	...	...	74.3	...	...	...	84.6
<i>Oil-seeds.</i>									
Safflower ...	38.3	77.1	...	...	...	81.5	...	81.1	69.5
Linseed ...	...	93.5	...	...	...	89.2	...	94.2	92.3
Niger seed ...	64.9	...	84.2	...	...	85.7	...	93.5	82.0
<i>Miscellaneous.</i>									
Chillies ...	...	...	73.2	79.2	...	...	...	...	76.2
Ambadi ...	51.9	...	...	75.1	89.4	...	77.7	86.2	76.0
Rajgira ...	...	...	...	...	...	...	95.6	...	95.6
Mustard (Mohori) ...	...	64.8	...	...	...	...	...	...	64.8
Average for localities.	67.0	81.4	84.1	84.8	79.9	83.7	86.4	84.4	...

SUMMARY AND CONCLUSIONS.

The seed supply both in the villages round Poona and in the district as a whole requires improvement. One cannot say that one class of seed, *e. g.*, cereals, is consistently better than another class, *e. g.*, pulses. The comparatively low percentage of useful seed in jowár, wál, pavta and tur is specially to be deprecated.

Attack by weevils is largely responsible for this. If a method of cleaning and storing can be found that absolutely forbids weevil attack, the percentage of useful seed will go up with a bound.

Storing of seed is possible as a rule only to Vánis (dealers in money and grain) and the richer cultivators. The poorer cultivator usually has his whole crop arranged for.

Selection is done by a few cultivators in the case of Bájri (*Pennisetum typhoideum*) and Jowár (*Andropogon Sorghum*). Ears with large seeds are selected and threshed separately, dried in the sun, mixed with ashes and leaves of the *nim* tree (*Azadirachta indica*) and placed in earthen pots. A layer of straw is spread over the seed and the mouth of the pot sealed with a mixture of cow-dung and mud. Some cultivators store the seed in a receptacle called the Kanang, when the seed is in large quantity. The Kanang is made of strips of Bamboo or Tur (*Cajanus indicus*) stem. It is smeared with ash and cow-dung and set on stones or bricks about 8" high. Thorny branches are put underneath to keep rats away. Though the attack of rats is avoided, weevils always play considerable mischief. The inclusion of *nim* leaves is supposed to keep off weevils but is not very effective. Some cultivators store in underground pits called *penvs*. Each *penv* is 5—6 feet deep, broad and long, and is occasionally lined with bricks. The seeds stored in these are apt to get mouldy. They are used for eating purposes mostly. The seeds are apt to gain moisture and weight.

If weevils are seen on the outside of a storage vessel the seeds are taken out and cleaned, otherwise they are left undisturbed.

The higher percentages of useful seed got as a rule from the bazár and the Agricultural College Farm seed are due to the more careful cleaning and storing there practised.

In the College Farm cleaning is done by the winnowing machine. The final finish being given by hand winnowing and sifting. There also small quantities of seeds especially pulses which are subject to weevil attack are stored in earthen jars the mouths of which are closed and plastered by mud. The seeds are thoroughly dried in the sun to drive off moisture and any weevils and insects, etc. Even with all these precautions seeds get weeviled. The larger quantities of seeds are stored in iron boxes which are made air-tight. Some are stored exposed to the sun periodically.

In the Vánis' shops in the bazar the seeds are sieved and the bigger grains sometimes stored separately. Sieving is resorted to when insects are observed and again at the time of selling. The seeds thus treated are higher in price than uncleaned seed by about 25 per cent.

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80	1908	Field, Garden and Orchard Crops of the Bombay Presidency, by G. A. Gammie, Economic Botanist, Bombay	0
81	1908	Establishment and Management of the Dairy Farm, by G. K. Kelkar, Assistant Professor of Agriculture	0
82	1908	Locusts in India, by H. M. Lefroy, Imperial Entomologist, Pusa	0
83	1909	Cultivation of Broach Cotton in Dhárwár, by M. L. Kulkarni, Divisional Inspector of Agriculture, S. D.	0
84	1909	Night-soil—A Valuable Manure, by G. K. Kelkar, Assistant Professor of Agriculture, Agricultural College, Poona	0
85	1909	Kalar in Sind, by G. S. Henderson, Deputy Director of Agriculture, Sind	0
86	1910	First Experiments in the Treatment of Grape-vine Mildew in the Bombay Presidency, by W. Burns, Economic Botanist	0
87	1910	An Examination of the Seed-supply of the Broach District, by G. D. Mehta.	0
88	1910	Experiments with the Water-Finder, by H. K. Mehta, Assistant Professor of Physics, etc., Poona Agricultural College	0
89	1910	The Salt Land of the Nira Valley, by Harold H. Mann, Principal, Agricultural College, Poona, and V. A. Tamhane, Laboratory Assistant, Agricultural College, Poona	0
40	1911	Cultivation of Guavas near Poona, Dhárwár and Límgaon, by L. B. Kulkarni, L.Ag., Agricultural Department, Bombay	0
41	1911	Groundnuts in the Bombay Deccan, by G. K. Kelkar, Assistant Professor of Agriculture, Poona	0
42	1911	Note on Long-stapled Cotton in Sind, by G. S. Henderson, N.D.A., N.D.D., Deputy Director of Agriculture, Sind	0
43	1911	An Examination of the Seed-supply of the Broach District, Part II, by G. D. Mehta, L.Ag. (Bombay), B.A. (Camb.), N.D.A., N.D.D.	0
44	1911	Preliminary Study of the Red Rot of Sugarcane in the Bombay Presidency, by G. S. Kulkarni, L.Ag., Assistant Mycologist	0
45	1911	Second Year's Experiments in the Treatment of Grape-vine Mildew in the Bombay Presidency, by William Burns, B.Sc. (Edin.), Economic Botanist to the Government of Bombay	0 14
46	1911	Seed Selection Series, I. Broach Cotton, by T. Forster Main, B.Sc., Deputy Director of Agriculture, Bombay Presidency, Poona	0 6
47	1911	San Hemp (<i>Orotolaria Juncea</i>), Tág (Maráthi), by P. C. Patil, L.Ag., Divisional Inspector of Agriculture, C. D.	0 4
48	1911	Poona Furnace (in the Sátára District), by P. C. Patil, L.Ag., Divisional Inspector of Agriculture, C. D.	0 7
49	1911	An Examination of the Seed-supply of the Ahmednagar District, Part I, by G. D. Mehta, L.Ag. (Bombay), B.A. (Camb.)	0 5
50	1912	An Examination of the Seed-supply of the Ahmednagar District, Part II, by G. D. Mehta, L.Ag. (Bombay), B.A. (Camb.)	0 3
51	1912	Third Year's Experiments in the Treatment of Grape-vine Mildew in the Bombay Presidency, by W. Burns, B.Sc. (Edin.), Economic Botanist to the Government of Bombay, and G. B. Patwardhan, B.Sc. (Bombay), Assistant Economic Botanist	0 3
52	1912	Muscovado Sugar Machinery and its scope for <i>Gul</i> manufacture in India, by G. N. Sahasrabuddhe, L.Ag.	0 8
53	1912	A Method of improving the Quality of Cotton Seed, by G. D. Mehta, B.A., L.Ag., N.D.A., N.D.D., and V. G. Gokhale, L.Ag.	0 7
54	1912	A Note on Steam Ploughing, by A. A. Musto, P. W. D., Agricultural Engineer, Bombay Presidency	0 10
55	1913	An Examination of the Seed-supply of the Poona District, Parts I and II, from the Seed Testing Department, Agricultural College, Poona.	0 3