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Experiment Station Results and Recommendations

For many years summer fallow has been recommended as a practice that will increase wheat yields and stabilize production. The recommendations which follow have been based largely upon results of scientifically controlled field tests. The findings of some such experiments are shown in Table I.

TABLE I - Influence of Fallow on Yield of Winter Wheat. /2

Location	Period of Years	Ave. Yield in Bushels Per Acre		Average Diff.	Percent Increase Over Continuous
		Wheat After Fallow	Continuous Wheat		
Hays	1908-46	22.4	16.0	6.4	40.0
Dodge Field	1939-47	26.9	15.1	11.8	78.1
Meade Field	1938-47	21.5	14.4	7.1	49.3
Garden City	1919-46	13.6	5.9	7.7	130.5

/2 Information for this table was furnished by Andrew B. Erhart, Associate Agronomist, U.S. D. A., Bureau of Plant Industry.

R. I. Throckmorton and K. E. Myers, of the Kansas Agricultural Experiment Station, have made specific recommendations in Kansas Agricultural Experiment Station Bulletin 293 for the use of Summer Fallow in Kansas. In general, these recommendations are as follows: For the western two tiers of Kansas counties alternate crop and fallow should be practiced. In the next two tiers of counties, or the third and fourth tiers from the Colorado line, summer fallow is recommended one year in three. Summer fallow is advised one year in four for the next two tiers of counties or the fifth and sixth from the Colorado line. In the remainder of the state summer fallow is not recommended for wheat production.

Yields on Kansas Farm Management Association Farms

For a number of years, Earl Heans, Extension Economist for Farm Management Association No. 3 has collected data relating to wheat yields on farms in south western Kansas. The purpose has been to study the effects of summer fallow in actual farm organizations. Results for the wheat crop harvested in 1949 are presented in Table II.

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TABLE II - Comparison of Yields of Wheat after Fallow with Yields of Continuous Wheat on the Same Farm Southwest Kansas, 1949.

Group /1	No. of Farms	Wheat After Fallow		Continuous Wheat		Ave. Diff.	Percent Increase Over Continuous
		Ave. Acreage	Ave. Yield	Ave. Acreage	Ave. Yield		
1	6	113.7	16.1	445.4	11.1	5.0	45.0
2	9	173.3	15.4	307.5	10.0	5.4	54.0
3	11	92.9	20.9	559.8	9.8	11.1	113.3
4	6	344.7	25.1	299.0	13.1	12.0	91.6
TOTAL	32	166.6	20.3	418.5	10.5	9.8	93.3

/1 Counties were grouped for this comparison as follows:
(1) Group 1 -- Barton, Stafford, Pratt and Barber.
(2) Group 2 -- Rush, Pawnee, Edwards, Kiowa and Comanche.
(3) Group 3 -- Ness, Hodgeman, Ford and Clark.
(4) Group 4 -- Lane, Finney, Gray and Meade.

Table II shows that for the entire area wheat yielded 93.3 percent more on fallow than on continuously cropped land.

Table III below demonstrates the effect of summer fallow on wheat yields on association farms for the four years 1946 - 1949 inclusive.

Table III - Comparison of yields of wheat after fallow with yields of continuous wheat on the same farm, 1946 - 1949 inclusive.

Group /1	No. of Farms	Wheat After Fallow		Continuous Wheat		Ave. Diff. in Yield	Percent Increase Over Continuous
		Ave. Acreage	Ave. Yield	Ave. Acreage	Ave. Yield		
1	64	68.8	26.6	347.4	16.8	9.8	58.3
2	67	121.3	24.0	359.9	15.1	8.9	58.9
3	57	106.0	26.0	331.2	13.3	12.7	95.5
4	44	365.3	25.7	379.4	13.2	12.5	94.7
TOTAL	232	149.3	25.5	353.1	14.8	10.7	72.2

/1 Counties were grouped for this comparison as follows:
(1) Group 1 -- Barton, Stafford, Pratt and Barber.
(2) Group 2 -- Rush, Pawnee, Edwards, Kiowa and Comanche.
(3) Group 3 -- Ness, Hodgeman, Ford and Clark.
(4) Group 4 -- Lane, Finney, Gray and Meade.

For all groups wheat on summer fallow outyielded wheat on continuously cropped land by 72 percent. This is a four year average figure. In the two most western areas the difference was even larger, amounting to about 95 percent greater.

Averages such as those presented in the preceding tables tend to cover up individual differences. Figure 1 is presented to show graphically some of these differences which occurred on individual farms.

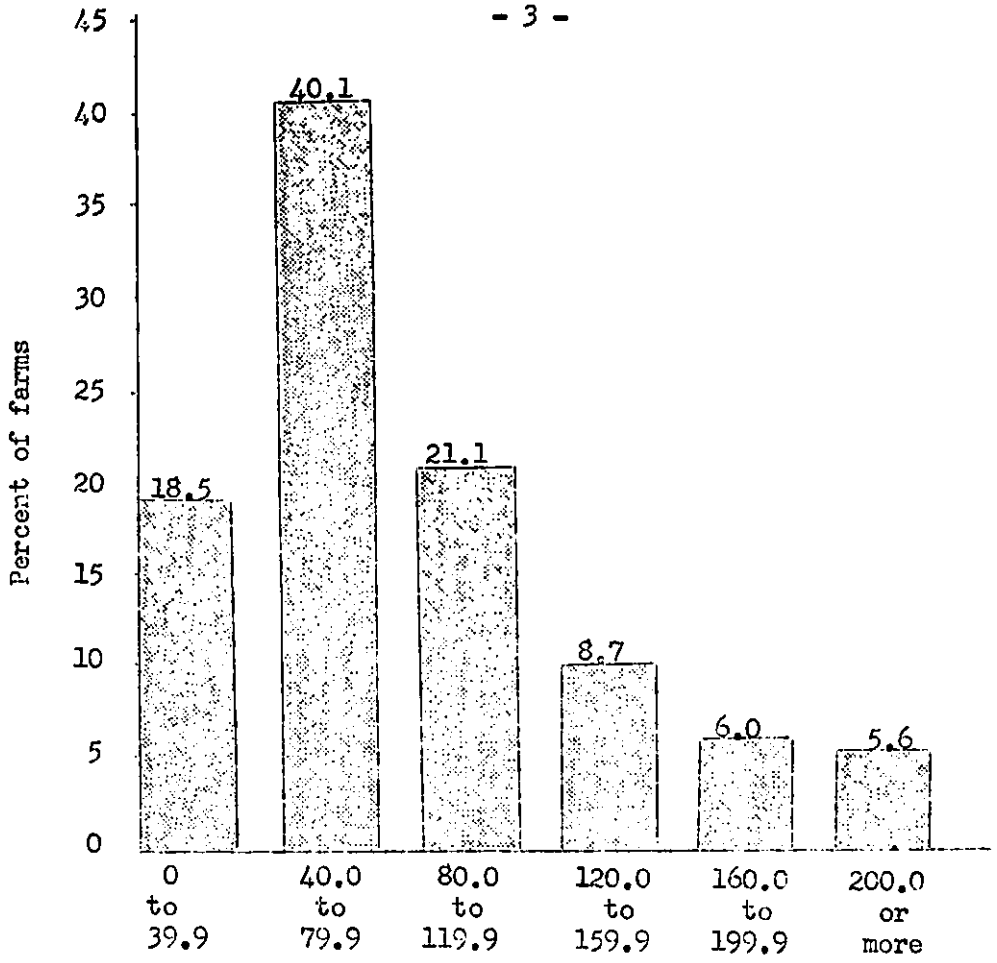

Figure 1. Distribution of farms according to the percent yields of wheat after fallow exceeded continuous wheat yields during the four years 1946-1949.

Figure 1 indicates that on 82 percent of the farms wheat after fallow exceeded continuous wheat by 40 percent or more. In terms of bushels this would be approximately 6 bushels or more per acre. On 41 percent of the farms yields of wheat after fallow exceeded those of continuous wheat by 30 percent or more. This would be approximately 12 bushels per acre based on the average yield of continuous wheat for the four year period. In terms of bushels this would be approximately 6 bushels or more per acre.

For the past three years a mail survey has been conducted by the office of the State Agricultural Statistician to determine differences in yields on summer fallow and on continuously cropped land. Results of these surveys are presented in Table IV.

Table IV - Wheat yields and abandonment on summer fallow and continuously cropped land for specific areas in Kansas 1947, 1948 and 1949. /1

Group /2	Fallow		Continuous Crop		Ave. Diff. in Yield	Percent Increase Over Continuous
	Yield /3	Percent Abandonment	Yield /3	Percent Abandonment		
1	20.1	8.6	12.8	13.9	7.3	57.0
2	18.8	7.4	12.6	8.8	6.2	49.2
3	16.0	6.6	12.1	7.7	3.9	32.2
TOTAL	19.1	8.0	12.4	9.6	6.7	54.0

/1 Source - Kansas Summer Fallow Acreage 1946-'47, 1947-'48, 1948-'49-- Mimeographed releases, Office of the Agricultural Statistician, Topeka, Kansas.

/2 The groups were determined by the recommendations for summer fallow in Bulletin 293, Kansas Agricultural Experiment Station, by R. I. Throckmorton and H. E. Meyers. The complete list of the counties in each group with the recommended practice for each is given below:

Group 1--Alternate crop and fallow. (Western two tiers of counties)

Cheyenne	Greeley	Stanton	Stevens	Wichita	Haskell
Sherman	Scott	Morton	Thomas	Kearny	Seward
Wallace	Hamilton	Rawlins	Logan	Grant	Finney

Group 2--Fallow followed by two years cropping. (Next two tiers of counties)

Decatur	Lane	Meade	Ford	Ness	Graham
Sheridan	Gray	Clark	Hodgeman	Trego	Norton
Gove					

Group 3-- Fallow followed by three years cropping. (Next two tiers of counties)

Phillips	Rush	Kiowa	Pratt	Barton	Osborne
Rooks	Pawnee	Comanche	Stafford	Russell	Smith
Ellis	Edwards	Barber			

/3 Per seeded acre.

It may be noted that Group 1 is the most westerly group and Group No. 3 is the area which is the farthest east. The percent that wheat yields on summer fallowed land exceed continuous decreases from west to east. This trend was also present in the data presented earlier. These data show somewhat less advantage to summer fallow than does other information presented in other parts of this report.

Comparison of Costs of Producing Wheat on Summer Fallowed and Continuously Cropped Land

Any complete consideration of the problem of summer fallowing must take into account the relative costs of the two practices. Some information on this problem has been collected by the Bureau of Agricultural Economics through the personal interviews in Pawnee, Lane, and Thomas counties. Table V and VI present some of this information.

Table V - Hours of labor used in producing wheat in Pawnee, Lane, and Thomas counties, Kansas. 1947 Crop

County	Continuous Cropping (2 crops) (Hrs. per acre)	Fallow (1 yr. fallow-1 crop)	Amount Continuous Cropping Exceeds fallow
Pawnee	3.30	2.50	.80
Lane	3.16	2.27	.89
Thomas	3.22	2.17	1.04
AVERAGE	3.23	2.31	.92

Table VI - Gallons of gas used in producing wheat in Pawnee, Lane, and Thomas counties, Kansas. 1947 Crop

County	Continuous Cropping (2 crops)	Fallow (1 yr. fallow-1 crop)	Amount Continuous Cropping Exceeds Fallow
	gallons per acre		
Pawnee	10.18	7.40	2.78
Lane	15.24	9.60	5.64
Thomas	9.44	7.22	2.22
AVERAGE	11.62	8.07	3.55

It requires approximately one additional hour of labor per acre to produce two continuous wheat crops as contrasted to one year fallow followed by wheat, Table V. The additional fuel required for continuous cropping is three and ½ gallons per acre, Table VI. There would, of course, be additional savings in machinery expenses such as grease, oil, machinery repairs, and machinery depreciation. One expensive operation, combining, is reduced approximately one-half by alternate crop and fallow as contrasted to continuous cropping.

In deciding whether summer fallow is or is not profitable, the reduction in cost of summer fallow must be weighed against the reduction in yield as compared with yields from two crops of continuous wheat. Profit or loss from summer fallow in any particular year depends upon the cost of the items necessary to produce wheat and the price of wheat.

On the basis of cost and yield figures presented in this report, however, it appears that summer fallowing would be a profitable practice if yields of wheat after fallow exceeded continuously cropped yields by 60 to 75 percent. It is believed that over a long period of time this requirement will be met for most of the area under consideration (the western six tiers of Kansas counties).

There are advantages to fallow in addition to those mentioned above. Summer fallowing enables the labor load to be spread over a longer period of time, and is conducive to a more stable farming program since yield fluctuations are not as great and crop failures are less frequent. More acres of land can be operated when summer fallow is practiced and wheat on summer fallow will provide more livestock pasture than will continuously cropped wheat.