EFFECTS OF THE PRICE SUPPORT PROGRAM ON PRODUCTION PRACTICES ON MICHIGAN FARMS IN 1950

Thesis for the Degree of M. S.

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Carl Wesley Staser

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This is to certify that the

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presented by

Carl Wesley Staser

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Lauren H. Brown

Major professor

Date November 29, 1951

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EFFECTS OF THE PRICE SUPPORT PROGRAM ON PRODUCTION PRACTICES ON MICHIGAN FARMS IN 1950

by

Carl Wesley Staser

AN ABSTRACT

Submitted to the School of Graduate Studies of Michigan State College of Agriculture and Applied Science in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Department of Agricultural Economics

Year 1951

Approved _____

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AN ABSTRACT

The purpose of this study is to determine the effect of the price support program on production practices used on Michigan farms in 1950.

This study covers a random sample of 505 farms of 70 acres or more located in the commercial farming area of southern Michigan, plus an additional 73 potato farms in Montcalm county. The interviews were made during July, August, and September of 1950.

The government's attempts to control production are believed to bring about changes on production practices on farms. Acreage allotments were placed on potatoes, wheat, beans and corn in 1950. Compliance with acreage allotments was required to be eligible for price supports. The purpose of this study is to show the effects of acreage allotments and price supports specifically on fertilization and acreage of the controlled crops.

The support prices for 1950 were relatively high and, at planting time of the crops studied, seemed to be as high or higher than the expected open market price. Therefore, there was a price incentive to farmers for staying under their acreage allotments. Since acreage was in effect rationed, it was expected that farmers would attempt to substitute capital in the form of fertilizer for land, the rationed factor of production.

The results of this study show that farmers planning to use price supports in 1950 reduced acreage and increased fertilization with the important exception of those in the potato study. The potato farmers planning to use price supports had not reduced acreage. This is believed to be due to the manner in which acreage allotments are handled in the county.

Farmers not planning to use price supports made only minor changes in acreage and fertilization with the single exception of the bean farmers who increased acreage 25 percent.

The farmers intentionally under acreage allotments had reduced acreage significantly and increased fertilization. Farmers over allotments had increased acreage and made little or no change in pounds of fertilizer used per acre.

The results of the potato study deserve special attention. Farmers using price supports increased fertilization 106 pounds per acre while the control group of farms not using price supports in either 1949 or 1950 made less than a one percent increase in pounds used per acre.

Potato farmers intentionally under acreage allotments decreased acreage 10 percent and increased fertilization 10 percent. Farms accidentally under allotments increased the rate of application by 128 pounds. While the farms under allotments were greatly increasing fertilization, farms over allotments increased acreage 17 percent and decreased fertilization 7 percent. Both of these changes were significant at the one percent level.

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The author is greatly indebted to the Hoyt C. Reed family, especially to Mrs. Reed, who typed the entire thesis.

Any omissions or errors in this manuscript are to be credited to the author.

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FOREWORD

This study is one of three segments of the research project entitled "Farmers' Responses and Adjustments to Production Control and Price Support Programs in Michigan." The project deals with farmers' knowledge of, and attitudes toward federal price support legislation, as well as farmers' behavior in the presence of the existing price support program. It was made by the Agricultural Economics Department of Michigan State College, in cooperation with the Production and Marketing Administration of the United States Department of Agriculture during the summer of 1950.

The first portion of the project entitled "Participation in the Federal Price Support Program by Michigan Farmers" was written by Darwin G. Kettering, and deals in detail with the methodology used and also serves as an over-all summary. The third portion is now being compiled and edited by Philip A. Wright. His study deals with farmers' attitudes and beliefs with regard to the price support program.

EFFECTS OF THE PRICE SUPPORT PROGRAM ON PRODUCTION PRACTICES ON MICHIGAN FARMS IN 1950

CHAPTER I

INTRODUCTION

Purpose

The government's attempts to control production are believed to bring about changes in production practices used on farms. It would be valuable to know the effects that governmental controls have had and what can be expected of attempts to control agricultural output in the future. The purpose of this study is to show the effects of the price support and production control programs on acreage and fertilization practices on potatoes, wheat, beans, and corn in Michigan in 1950.

It is hoped that this study will be of practical value to those who make, teach, or administer agricultural policy and may in the long run, be of benefit to the general public.

Hypotheses

The belief has been shared by many that governmental attempts to control production by semi-voluntary acreage reduction has been, or will be, to a certain extent, offset by the use of improved pro-

duction practices. It was suspected that farmers raising controlled crops under acreage allotments, and using price supports would substitute capital and/or labor for land. If this did occur, acreage of specified crops might be reduced without any appreciable decrease in total production.

The term "improved production practices" identifies those practices that increase production per acre, or decrease cost per unit of output, or both, so as to increase the net returns to the farmer.

When crop acreage is rationed[1] improved production practices are likely to be thought of primarily as those which will increase production per acre. Among the important practices that are used to intensify production are:

1. Use of more fertilizer
2. Planting hybrid or certified seed
3. Using best adapted varieties
4. Improved crop rotations
5. Using improved methods for seedbed preparation and tillage
6. Planting rows closer together and plants closer in the rows
7. Use of insecticides and weed killers
8. Use of hormones
9. Irrigation
10. Use of more labor (which is involved in some improved practices)

1. "Crop acreage control is a form of rationing of the productive agents available to the farm." Schultz, T.W. and Brownlee, O.H., Effects of Crop Acreage Control Features of A.A.A. on Feed Production in 11 Midwest States (Ames, Iowa State College, April, 1942). Agricultural Experiment Station Research Bulletin 298, p.675.

In addition to these, increased average outputs per acre can also be brought about by using the best land available for the restricted crop or crops.[2]

This study is limited to the changes in the use of commercial fertilizers, barnyard manure, and plow-under crops from 1949 to 1950 by farms grouped according to compliance with acreage allotments in 1950, and stated intentions for using price supports in 1950.

The hypotheses for this study are: that farms using price supports and complying with acreage allotments are using more fertilizer than farms not using price supports and not complying with acreage allotments; and that farms using price supports and complying with acreage allotments made greater increases in average amounts of fertilizer used per acre from 1949 to 1950 than farms that did not. Companion hypotheses for the study are: that farms using price supports and complying with acreage allotments reduced acreage of controlled crops; and, farms not using price supports and not complying with acreage allotments either maintained or increased the acreage of controlled crops.

History

Acreage allotments were placed on potatoes, corn, wheat, and dry field beans[3] in 1950. To qualify for price supports on the 1950 pro-

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2. Schultz and Brownlee, op.cit., p.676

3. Acreage allotments were also in effect for rice and marketing quotas, based on acreage allotments, were in effect on cotton, peanuts, and tobacco. Potatoes, corn, wheat, and beans were the only restricted crops grown in Michigan and are the crops to be treated in this study.

duction of any one of these crops, a farmer had to stay within his allotment, i.e., to plant only the number of acres alloted to his farm or less. This was the first year that acreage allotments had been used since 1943.

The history of attempts to control agricultural production stems back to World War I. Prices and demand for farm products had skyrocketed during the war only to collapse in 1920. Congress was hunting for legislation to help agricultural prices along the road to recovery. The Congress and the President could not see eye to eye on a program. Finally, in 1929, the Agricultural Marketing Act established the Federal Farm Board. The stated purpose of the Farm Board was to develop orderly marketing procedure and to purchase surpluses which were depressing prices. Instead of solving the problem of low prices and surpluses, the Farm Board was wiped out by continued accumulation of surpluses and falling prices as the depression grew worse. It had attempted to support the price of a few selected commodities while the general price level was falling.

The lesson learned from the experience of the Federal Farm Board was that prices cannot be pegged without control of production. Accordingly, the Agricultural Adjustment Act of 1933 contained provisions for adjusting production by means of acreage restrictions and for establishing parity prices. The continuation of large surpluses, plus repeal of parts of the original Agricultural Adjustment Act led to the Agricultural Adjustment Act of 1938 which provided for marketing quotas

to make possible production control.[4]

Despite the effort of the A.A.A. to control acreage, stocks of corn, wheat, and cotton, were at record levels at the outbreak of the World War II. By the use of better production practices, farmers appreciably increased yields per acre. Total output was well maintained despite curtailment of acreage planted.[5]

Concurrent with the development of government price support and acreage control programs there has been a trend toward greater use of fertilizer in Michigan (Figure 1). This increase in fertilizer use has resulted from several forces. Education has been a major factor. Michigan State College through its Extension staff has encouraged the use of more fertilizer and higher analysis fertilizers (Appendix B).[6] Higher prices received for farm products relative to the price of fertilizer has made the use of more fertilizer profitable. The price support program, due to its affect on prices, has been a factor in the use of more fertilizer. A major hypothesis of this thesis is that acreage allotments, which were reinstated as a part of

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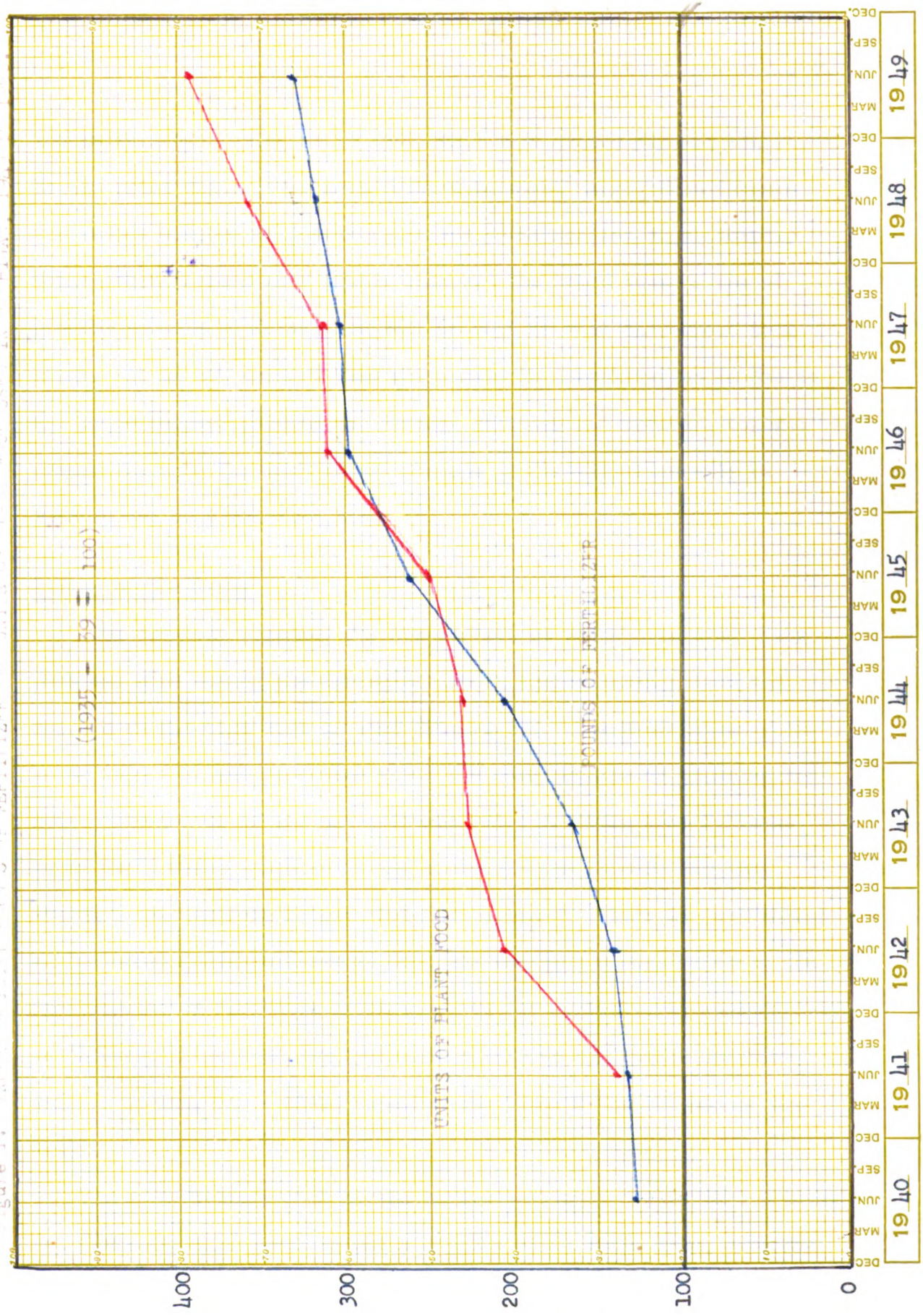
4. Congressional Record of the 79 Congress, 2nd Session, Report No. 2728, August 6, 1946.

5. Long-Run Effects of Price-Maintenance Policy for Agricultural Products, Committee on Agricultural Policy, Association of Land Grant Colleges and Universities, April, 1947.

6. As this is being written, Paul Rood, Soils Extension Specialist at Michigan State College, is carrying on a project to get as many wheat growers as possible to plant a strip of 10 drill widths around one field with 500 pounds of fertilizer per acre. This is over twice the average rate found to be used for wheat in this study.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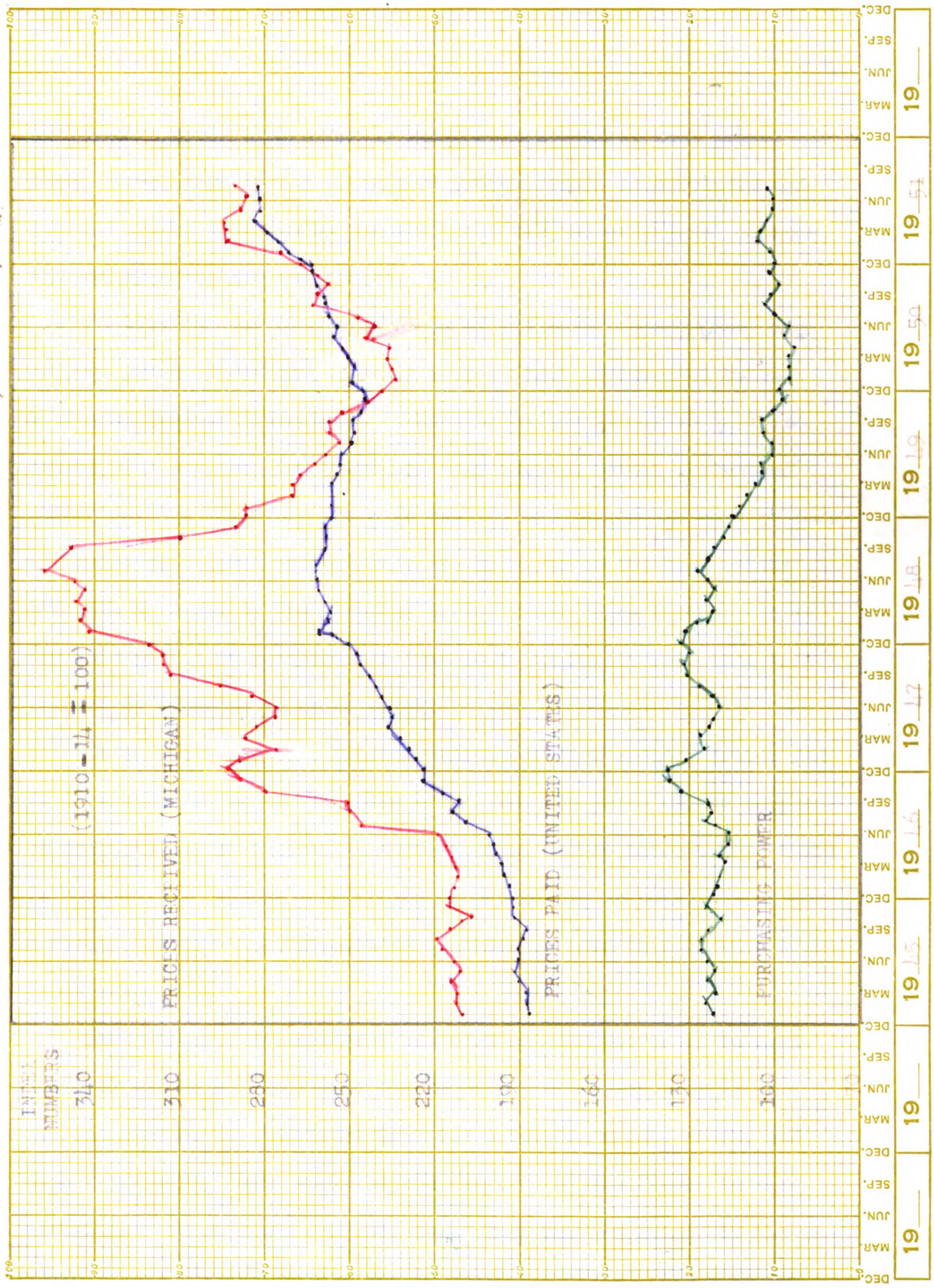
(1935 - 39 = 100)
UNITS OF PLANT FOOD
COUNTS OF FERTILIZER

the price support program in 1950, will have caused farmers wanting to use price supports to have reduced acreage. Also, that farmers who reduce acreage will have increased fertilization significantly while other farmers made little change. The trend towards use of greater amounts of fertilizer must be kept in mind throughout this study. It is not assumed that all change in fertilization is due to the price support program and acreage allotments. However, control groups are used for each crop. Changes in fertilization will be pointed out on a relative basis.

Timing of the Study

The original planning for the project of which this study is a part was done during the Spring of 1950. Agricultural prices had reached an all-time high in 1948 (Figure 2). The whole economy was going into a slight recession which had some promise of becoming serious. The memory of the agricultural price collapse that followed World War I still lingered in the minds of farm leaders and they wouldn't let Congress forget what had happened. There is just enough agricultural fundamentalism in Congress and just enough votes in the farm population to attain price supports for agricultural commodities at 60 to 90 percent of parity based on 1910 to 1914 price relationships. In many cases these supports are towards the top end of the range.

Thus, relatively high levels were established for support prices. By relatively high level is meant a price which would bring onto the


INDEX NUMBERS
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130
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(1910-14 = 100)
PRICES PAID (UNITED STATES)
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market more goods than normally would be consumed at that price. In other words, high levels of support prices result in surpluses and storage stocks that can be absorbed only ~~the~~ by the artificial demands created by a wartime atmosphere.

In times of war or a high state of military preparedness, high support price levels may actually help to hold prices down by encouraging greater production. This will be the situation in this country for the next few years and high support levels may not be objectionable. However, peace in reality may return and when it does the existing support price levels are going to be too high unless there is a change in the trend of Agricultural Price Policy. It is for this period of readjustment that must eventually come that this project is expected to be of value.

It is one thing to establish relatively high support prices and it is another thing to keep them effective. No price can be supported indefinitely at a level above the normal market price unless there is control over either consumption or production or both. It is now a recognized fact that production controls go hand in hand with high price supports.

The prospects of surpluses and even greater decreases in agricultural prices had motivated the Secretary of Agriculture to establish acreage allotments for 1950 for potatoes, wheat, beans, and corn (Figure 2). What would be the reaction of the farmer in this situation? Farmers are economic men. They too are guided by the invisible hand that points the way to greater profits. Given proper

advice or past experiences that have conditioned their reactions to do so, they will attempt to maximize profits. The following advice was given to farmers by Michigan State College in January 1950.[7]

> "Is it good business, from the standpoint of the individual farmer, to stay within the wheat acreage allotment? According to present indications most farmers believed the answer to be 'yes' when they sowed wheat last fall. As long as the announced support price appears to be considerably above the anticipated market price for the next season it will be good business to comply on acreage. Unfavorable weather, an expanded world market, or monetary inflation could raise market price and render the support ineffective, but these factors cannot be accurately predicted at planting time.
>
> "Assuming that corn acreage will be allotted, should a farmer plan to reduce corn acreage in 1950? The answer here is not clear cut as in the case of wheat. Michigan farmers, for the most part, do not sell corn. Many actually buy corn in addition to their own crop. To them a support price on corn only means higher feed cost."
>
> " .....
>
> "In planning 1950 corn acreage, carefully consider the outlook for corn prices next fall. Corn will disappear rather rapidly during the next several months through livestock. The numbers of cattle and hogs on feed are high. The dairy product-feed ratio is favorable, and is encouraging heavy grain consumption in that enterprise. If there should be an average or below average corn crop in 1950 there is a chance that the market price of corn will approach the support price. If this happens there would be little advantage in staying within an acreage allotment."

Many farmers did comply with acreage allotments in order to be eligible for price supports. The price supports levels were expected to be as high or higher than the free market price.

Thus 1950 appeared to be an ideal time to test the effect of acreage allotments and the price support program on production practices.

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7. Quoted from "Farming Under Current Controls," by L.H. Brown in Michigan Farm Economics, Michigan State College Extension Service Dept. of Agricultural Economics, No. 85-Supplement, East Lansing January 1950.

Farmers had the choice of ignoring acreage allotments and risking the open market price, or complying with acreage allotments and having a high guaranteed support price to rely upon. This was the setting as the survey was being planned and as the schedule was being prepared.

However, in June 1950, the Korean affair brought this country into limited warfare. Agricultural prices started upward (Figure 2). Not only did the trend in agricultural prices reverse itself but the likelihood was that prices farmers received would be as high or higher than the price support levels. This was the situation when the interviews were taken from July 15 to September 15, 1950.

The farmers' plans and decisions as to acreage and fertilization, in most cases, were already made and could not be changed. However, many farmers who had used price supports in 1949 and logically could have been expected to use them again in 1950, providing they were eligible to do so, stated that they did not intend to use them. The most common reason given for this change was the difference in price wasn't expected to be great enough to warrant the extra trouble. Some were even expecting higher prices on the open market than the guaranteed government prices. (Figures 3 and 4).

The outbreak of fighting, with the resultant change in demand for agricultural commodities, did not invalidate this study. It did, however, force changes in methodology used in determining the effect of the price support program on fertilization.

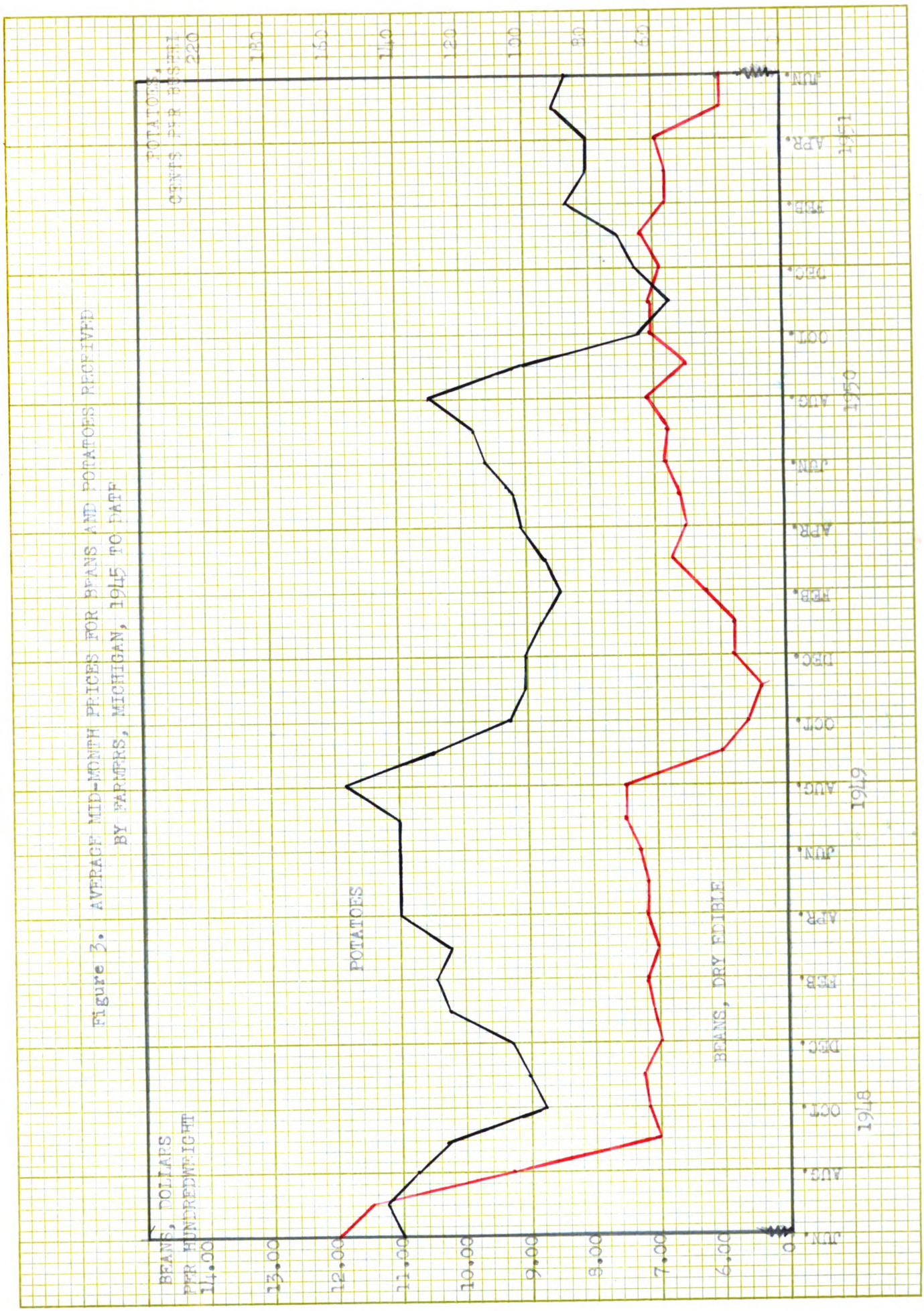

Figure 2. AVERAGE MID-MONTH PRICES FOR BEANS AND POTATOES RECEIVED BY FARMERS, MICHIGAN, 1945 TO DATE

Figure 4. AVERAGE MID-MONTH PRICES FOR WHEAT AND CORN RECEIVED BY FARMERS, MICHIGAN, 1945 TO DATE

Methodology

The over-all project of which this study is a segment, "Farmers' Responses and Adjustments to Production Control and Price Support Programs in Michigan," covered 578 farms. These farms were located in Lenawee, St.Joseph, Eaton, Livingston, Salinac, Saginaw, and Montcalm counties. This sample was randomly selected to represent the commercial corn, wheat, beans, and potato producing farms of 70 acres or more in the commercial farming areas of southern Michigan. The methodology used for the over-all project is described in detail by Darwin Kettering in the first segment of this project.[8]

The data used in this study came from the first 7 pages of the schedule that was developed and used for the over-all project (Appendix A). General information available included size of farm, acres owned, acres rented, estimated production of each crop in 1949, and average amounts of crops usually sold. Data that helped give a complete picture of the fertilization on each farm included the following: a map of the farm with all fields numbered, number of acres in each field, crops grown on each field in 1949 and 1950, pounds of commercial fertilizer used on each field, analysis of fertilizers used on each field, fields covered with barnyard manure, crops preceded by plow-under crops, and tons of commercial fertilizer purchased. Information pertaining to the farmer's participation in the price support program was also gathered and included the following: the manner in

8. Kettering, Darwin G. Participation in the Federal Price Support Program by Michigan Farmers, unpublished thesis for the Degree of M.S. Michigan State College, East Lansing, August 1951.

which each crop was disposed of in 1949, reasons for using or not using price supports in 1949, changes in use of price supports from 1949 to 1950, reasons for the changes, acreage allotments for each crop, actual acreage of alloted crops, and reasons for being over or under allotment on each crop.

It was believed that pounds per acre was not completely accurate as a measure of commercial fertilizer used since fertilizers vary greatly in analysis. Therefore the analysis of the fertilizers used was collected along with the pounds per acre data. With information on fertilizer analysis as well as pounds of fertilizer used per acre, the changes in fertilization for each crop could be accurately measured.

Two groupings were used to determine the effect of the price support program on acreage and fertilization practices for each crop. The farms were first grouped according to intended use of price supports in in 1950:

Group A. Farms whose operators were planning to use price supports for the particular crop in 1950.

Group B. Farms whose operators had used price supports for the particular crop in 1949 but were not planning, at the time the survey was taken, to use them in 1950.

Group C. Farms whose operators had not used price supports for the particular crop in 1949 and were not planning to use them in 1950.

A number of these farmers in Group B had made their original planting and fertilization decisions with the intention of using price supports. However, the sudden rise in agricultural prices brought about by the Korean War and defense mobilization effort had caused them to decide not to use price supports in 1950. They were expecting open market prices to be as high or higher than the support levels.

The farms were next grouped according to compliance with acreage allotments in 1950:

Group 1. Farms under acreage allotments intentionally.

Group 2. Farms under acreage allotments accidentally.

Group 3. Farms over acreage allotments.

The farmers had given various reasons for complying or not complying with allotments. Those who said that they were under their allotments in order to be eligible for price supports or to go along with the government program were placed in Group 1. Placed in Group 2 were those farms whose operators claimed that compliance was due to size of field, amount usually planted in the rotation, or that the allotments happened to be as large as they had intended planting in 1950. Farms over allotments for any reason were grouped together in Group 3.

In the following chapters these groups will be used to measure the effect of the price support program and acreage allotments on acreage and fertilization practices on Michigan farms for potatoes, wheat,

beans, and corn in 1950.

Acreage was to be reduced in 1950 (Table I). Did farmers who intended to use price supports in 1950 reduce acreage and did farmers who reduced acreage increase fertilization? These are the questions that this study will attempt to answer.

TABLE I. ACREAGE ALLOTMENTS FOR 1950-CROP CORN, WHEAT, DRY EDIBLE BEANS, AND POTATOES, AS OF APRIL 1950, AND 1949 PLANTED ACREAGES, UNITED STATES [9]

Commodity	1949 planted acreage	1950-crop acreage allotment	Percent Reduction Requested
	Acres	Acres	
Corn	57,579,000	(a)46,246,973	20
Wheat	84,931,000	68,944,099	19
Dry edible beans	(b) 1,900,000	(c)	20
Potatoes	1,242,200	(d) 1,137,800	8.4

(a) Commercial area only
(b) All classes
(c) 80 percent of 1949 planted acreages of eligible classes.
(d) Commercial acreage only (3 acres or more per farm).

9. Price Programs of the United States Department of Agriculture Agriculture Information Bulletin No.13. Production and Marketing Administration United States Department of Agriculture, April, 1950.

CHAPTER II

CHANGES IN POTATO FERTILIZATION IN MICHIGAN

By Farms According to Use of Price Supports and Compliance with Acreage Allotments in 1950

The purpose of this phase of the study is to determine the effect of price supports and acreage allotments on the fertilization of potatoes. It will be shown that reducing acreage does not necessarily mean reducing production. An original assumption for this study was that farms using price supports in 1950 would have reduced acreage to comply with allotments. The first hypothesis to be proven is that farms planning to use price supports have increased fertilization in order to intensify production and thus substitute capital for land. The second portion of this potato study is based on the assumption that farms intentionally under acreage allotments have complied with them in order to be eligible for price supports. The hypothesis to be proven is that farms intentionally under acreage allotments have increased fertilization and are using more fertilizer than farms not complying with acreage allotments.

The Department of Agriculture has probably received more criticism and adverse publicity from the price support program on Irish potatoes than on any other phase of its support activity. Newspapers and magazines, many of which were unfriendly towards the administration, have pointed up the "potato scandal" as a prime example of bureaucratic mismanagement. The buying and dumping of surplus potatoes has been treated

with almost as much vigor as the killing of little pigs during early Agriculture Adjustment Administration days.

United States Department of Agriculture may be the victim of circumstance. It seems to be caught between the support price levels passed by a politically minded Congress, that brings onto the market excess production in periods of peace, and the ability of potato farmers to increase production per acre when acreage allotments are imposed. If the hypotheses stated above are true, a ten percent reduction in acreage allotments will not necessarily bring about a ten percent reduction in total production. This study will show that farms under acreage allotments and whose operators were planning to use price supports, increased the use of fertilizer and have, at least in part, offset the original purpose of reduced acreage allotments.

FARMS GROUPED BY INTENDED USE OF PRICE SUPPORTS

Of the 578 farms visited in this survey, 95 raised potatoes commercially[10] in both 1949 and 1950. In order to show the effect of the governmental price program the 95 farms were divided into three groups according to their intended use of price supports:

Group A. Farms whose operators planned to use price supports for their 1950 potato crops.

Group B. Farms whose operators had used price supports for potatoes in 1949 but were not planning to use them in 1950.

Group C. Farms whose operators had not used price supports for potatoes in 1949 and were not planning to use them in 1950.

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10. These farms raised potatoes to sell.

It was expected that farms in Group A would have reduced acreage and increased fertilization. Group C was expected to show little change. Operators of many of the farms in Group B had originallyplanned to use price supports but had changed their minds after the change in market outlook which followed the outbreak of hostilities in Korea. Therefore, Group B was expected to show changes similar to those of Group A.

General Information

There were 27 farmers who planned to use price supports in 1950 (Group A). Twenty-three had used price supports in 1949 and four had not (Table II). A total of 15 operators had used price supports in 1949 but were not planning to use them in 1950 (Group B). This group included some of the larger operators who believed that the free market price would be as high or higher than the support price for potatoes. The operators of 53 farms had not used price supports either year and served as the control group for this study (Group C). Changes in their fertilization practices would have to be attributed to causes other than the acreage allotment and price support program.

It will be noted that the average size of farm in Groups A and B was clearly larger than the average size of farm in Group C. This is consistent with the findings of Darwin Kettering[11] in his over-all summary of this survey which show a definite correlation between size of farm and use of price supports. Considerably more potatoes were grown and sold by the farmers of Groups A and B (Table II). Thus any differ-

11. Kettering, Darwin G. op. cit.

TABLE II. GENERAL INFORMATION FOR THE FARMS RAISING POTATOES -- BY USE OF PRICE SUPPORTS

	GROUP A	GROUP B	GROUP C
Number of farms	27	15	53
Average size of farms	187.96	205.83	154.47
Average bushels of potatoes produced in 1949 *	4,089.50	10,423.10	2,843.87
Average bushels of potatoes usually sold*	3,111.25	9,480.80	2,811.54

* These are the averages of farms for which estimates of both the 1949 production and amounts usually sold were available. They represent 20 farms in Group A, 13 farms in Group B, and 39 farms in Group C.

ential in price would have been of greater financial importance to them than to the operators of the farms in Group C.

Change in Potato Acreage

An assumption for this study was that with the coming of acreage allotments farms using price supports would be forced to reduce their acreage. Actually, however, there was little change between the average acreage grown in 1949 and 1950 by the three groups (Table III). There was practically no variation in the acreage of Groups A and C. In Group B one farmer increased his potato acreage from 20 acres in 1949 to 66 acres in 1950. This increase of 46 acres is greater than the total over-all increase of the group. The other farms averaged about the same as in 1949. Thus the original assumption that Group A would have reduced acreage in 1950 was not borne out by the data collected.

The explanation may lie in the manner in which acreage allotments are handled by the County P. & M.A. offices. Montcalm County was granted total acreage allotments in 1950 amounting to approximately 90 percent of its 1949 potato acreage. Those operators wishing to plant more potatoes than their original allotment could appeal for a larger allotment. If the appeals were approved they could have been granted an increase. These extra acres would have come from the unused portion of the county's allotment. In other words, the P.& M.A. is working for the benefit of the farmers and is trying to be as reasonable and helpful as possible to the producers. The general impression received while taking interviews was that few big potato producers in Montcalm County actually would have been forced to reduce acreage in 1950. In

TABLE III. POTATO ACREAGE AND COMMERCIAL FERTILIZATION IN 1949 AND 1950 AND CHANGES OCCURRING FROM 1949 to 1950 -- BY USE OF PRICE SUPPORTS

	GROUP A			GROUP B			GROUP C		
	1949	1950	Percent Change	1949	1950	Percent Change	1949	1950	Percent Change
Total number of farms	27	27		15	15		53	53	
Number of farms using fertilizer	26	27	+3.85	14	15	+7.14	45	43	-4.44
A. Acreage									
Total acres grown	416.20	414.50	-0.41	470.00	511.50	+8.83	614.20	628.95	+2.40
Average acres grown	15.41	15.35		31.33	34.10		11.59	11.87	
B. Rate of Fertilization									
Percent of crop fertilized	94.16	98.07	+4.15	95.74	100.00	+4.45	93.57	90.08	-3.73
Average pounds per acre fertilized	631.44	737.31	+16.80	680.45	764.19	+12.31	567.45	570.96	+0.62
Average units per acre fertilized	176.69	209.36	+18.50	186.04	211.34	+11.97	162.24	163.70	+0.80
Average units per cwt. of commercial fertilizer	27.98	28.37	+1.39	27.34	27.66	+1.17	28.59	28.67	+0.28

fairness to the program, however, it must be made clear that the acreage allotment for each ownership tract is made on the historical average of potato acreage grown on that particular tract. The farms in Group A may have had historical averages high enough to permit them to plant the same acreage in 1950 as in 1949. Although this would explain the failure to reduce acreage by farms using price supports, it seems highly improbable.

There was a substantial difference in the average acreage grown by the three groups. It is interesting to note that Group B contains some of the larger operators who had used price supports in previous years but who had decided to go it alone in 1950. The largest potato grower in the whole study fell in this group. He raised 153 acres of potatoes in both 1949 and 1950 and, incidentally, was under his allotment.

Use of Commercial Fertilizer

Eighty-five of the 95 potato farmers in this survey used commercial fertilizer on potatoes in 1949 and 1950. The percent of acres covered ran from 90 on Group C in 1950 to 100 on Group B in 1950 (Table III). There does not appear to be any significance in the minor fluctuations in percent of the potato crop fertilized.

Significant changes were made in the amounts of fertilizer used on potatoes. The farmers planning to use price supports in 1950 had increased the average rate of application from 631 pounds in 1949 to 737 pounds in 1950. This was an actual increase of 106 pounds per acre, or a 17 percent increase over 1949. The average rate for Group B, those farms changing from support to no supports, also made a remarkable jump

from 680 to 764 pounds per acre. This was an actual increase of 84 pounds per acre, or a percentage increase of 12. These changes were tested and proved to be significant at the 1 percent level. All the farmers in Group B had used price supports in 1949 and most of them were still eligible to use them in 1950. The figures in Table III also show that the farms not using price supports either year (Group C). changed the average amount of fertilizer used per acre only 3 pounds. This variation lacks significance.

The results of using units of plant food as a measure of fertilization were approximately the same as the results when pounds per acre were used. Group A increased fertilization from 177 units to 209units an 18.5 percent increase. Group B also showed a considerable increase, advancing from 186 to 211 units. This was an increase of 11.5 percent over 1949. The 53 farms not using price supports either year (Group C) varied less than one percent in the total units used in 1949 and 1950. Here the figures were 162.24 and 163.70 units per acre for 1949 and 1950 respectively.

Change in Levels of Fertilization

The farms planning to use price supports (Group A) and those that had used them in 1949 (Group B) had definitely increased their rates of application of commercial fertilizer. In order to show these changes, three relative levels of fertilization were arbitrarily established for this study. Figure 5 has been made to show the comparative shifts in levels of fertilization made by Groups A. B, and C from 1949 to 1950. The three levels used for potatoes were as follows: low, 0 to 99 units

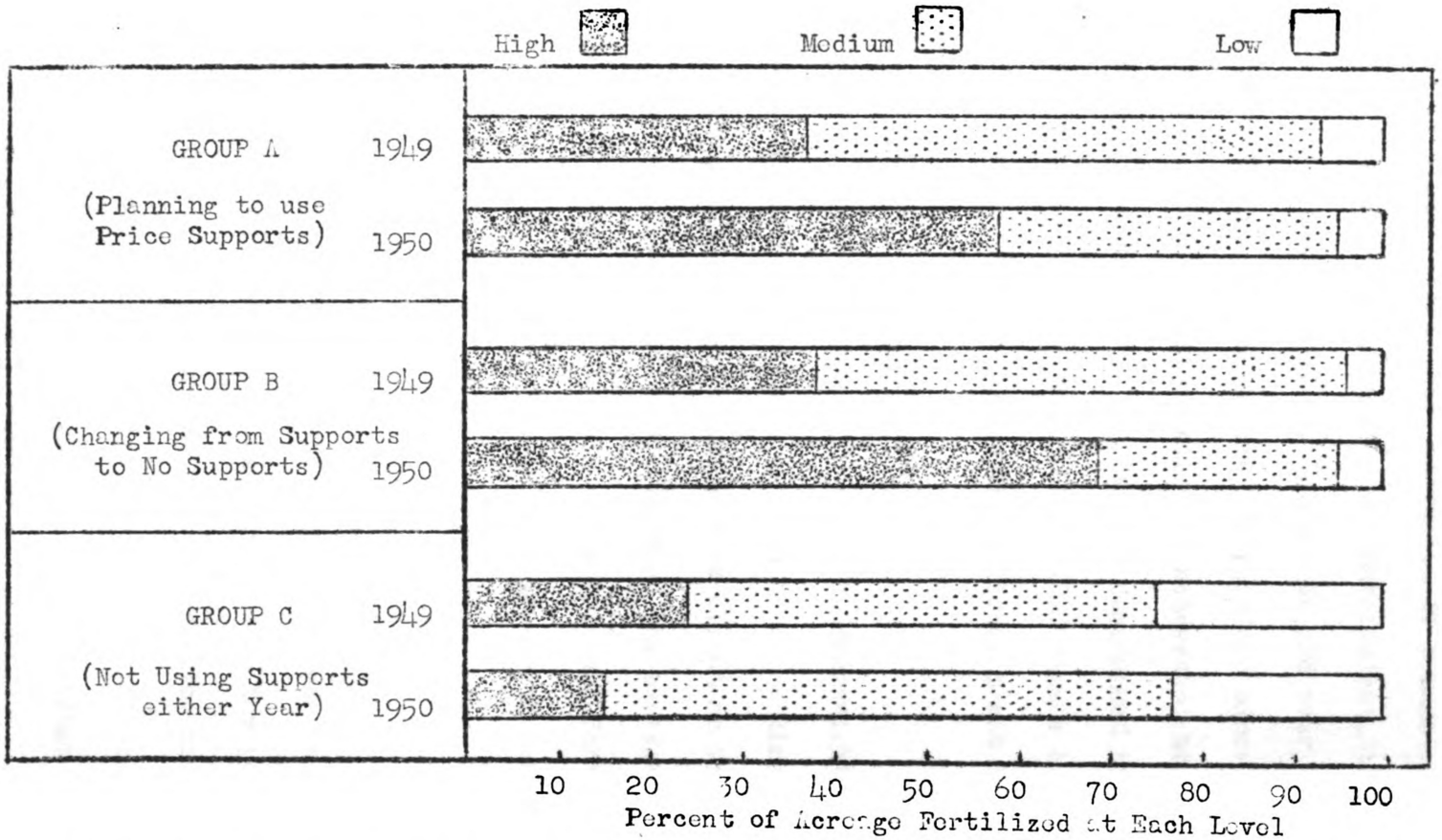

Figure 5. Percent of Acreage in Potatoes Fertilized at Various Levels* in 1949 and 1950, By Use of Price Supports in 1950.

*Low, 0 to 99 units of plant food per acre; medium, 100 to 199 units; and high, 200 units and over.

of plant food per acre; medium, 100 to 199 units; and high, 200 units or more. If these figures were converted to pounds of 3-12-12 fertilizer, which contains 27 units per hundredweight, the three levels would be 0 to 370 pounds, 371 to 740 pounds and over 740 pounds per acre. In this case 3-12-12 is used as standard since it was most commonly used and the average units per hundredweight of all fertilizers used approximately 27. The fact is recognized that a farm using 2-12-6 would have to apply from 500 to 1,000 pounds to fall in the medium range as defined at 100 to 200 units of plant food.

Change in Analysis of Fertilizers Used

The average units of plant food per hundredweight of commercial fertilizer used in 1949 and 1950 by each of these three groups was also computed (Table III). These figures show almost no variation from 1949 to 1950 and very little difference between the averages of the three groups. It is interesting to note, however, that fertilizers of higher analysis are being used on potatoes than are being used on corn, wheat, or beans.

Use of Barnyard Manure

Data were also gathered pertaining to the use of barnyard manure and plow-under crops for potato fertilization. The potato farmers studied used extensively these means of increasing soil fertility. Barnyard manure was used primarily for the fertilization of potatoes on the farms in this study. Approximately 60 percent of the total potato acreage was covered in 1949 and approximately 55 percent

received barnyard manure in 1950 (Figure 6). Group C led in the use of barnyard manure by covering 69 percent of its total potato acreage in each of the years covered by this study. Group A followed with 68.5 percent in 1949 and 60 percent in 1950. Group B was able to cover only 52.55 percent of its potato acreage in 1949 and 32.94 percent in 1950 because it had less barnyard manure available as well as more acres to cover per farm.[12] It should be noted that no attempt was made to determine the tons of barnyard manure used per acre. The results presented here indicate that farms not using price supports covered a slightly higher percentage of their potato acreage with barnyard manure than farms using price supports.

Use of Green Manure

Many of the potato farmers were using plow-under crops. These plow-under crops, or as they are commonly called, green manure crops, are raised to be turned under in order to add organic matter to the soil. When legumes are used, nitrogen is taken from the air and placed in the soil in an available form for the potato crop and other crops that follow in the rotation.

The farms in Group B made up for their lack of barnyard manure by using more green manure crops. Eighty-one percent of the potato acreage of this group was preceded by a plow-under crop in 1949 and 58 percent in 1950. Group A used green manure crops for approximately

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12. The largest potato farmer in this group hauls manure from the commercial duck raising farms at Alma.

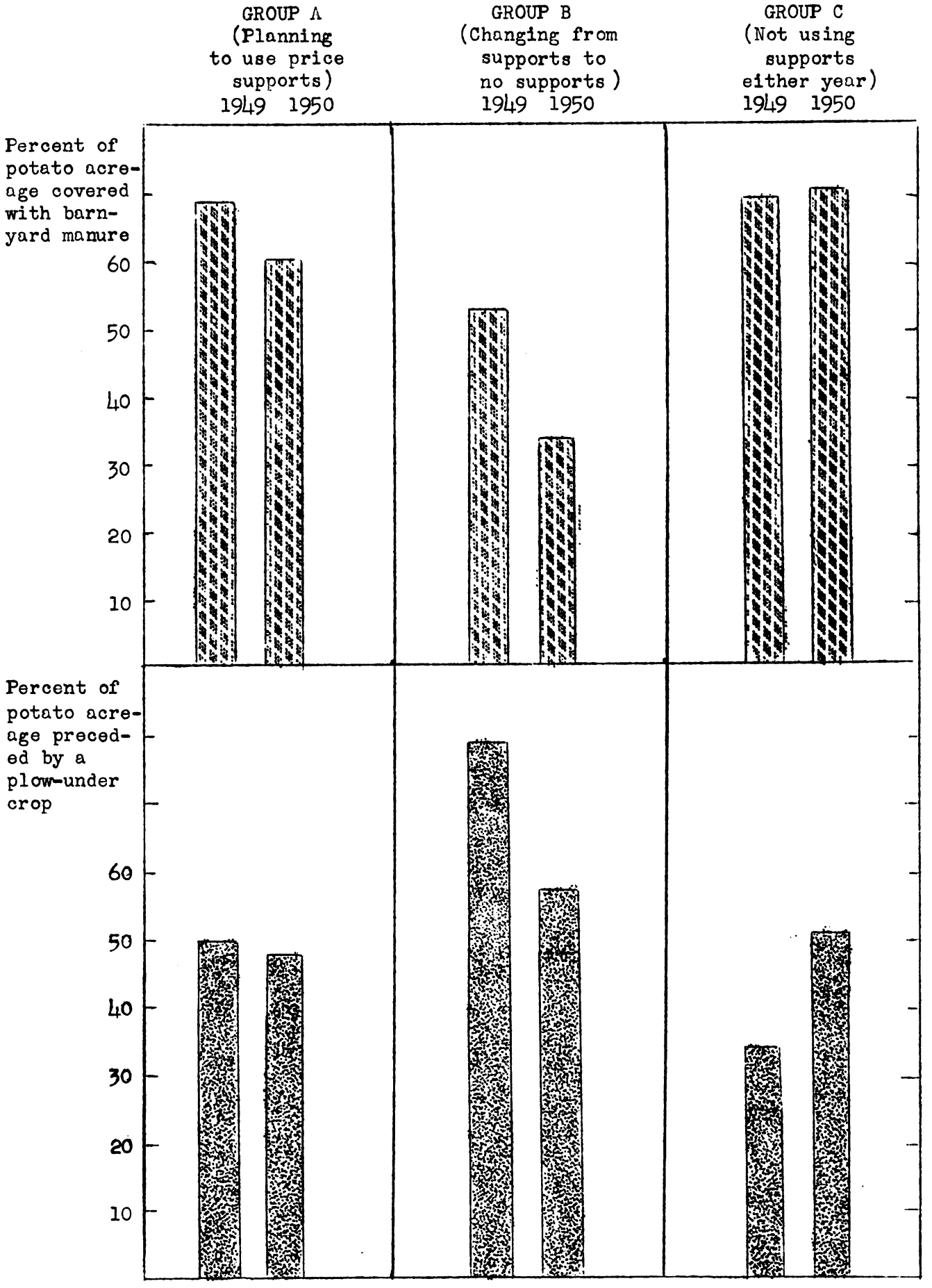

Figure 6. Use of barnyard manure and plow-under crops in potato fertilization in 1949 and 1950, by use of price supports in 1950.

half of its potato acreage in both 1949 and 1950. Group C, which apparently used the most barnyard manure, ranked lowest in the use of plow-under crops.

No estimate was made of the tons of green manure or of the percent of the stands that were plowed under on the various farms. The only data collected were acres of potatoes which were preceded by plow-under crops.

FARMS GROUPED BY COMPLIANCE WITH ACREAGE ALLOTMENTS

The major difference in the agricultural price support program for potatoes in 1950 from that of 1949 was the use of acreage allotments. To have been eligible for price supports on his 1950 potato crop, a farmer must have complied with his acreage allotment, i.e. to have planted acreage under or equal to the allotment for the tract or tracts of land that he operated.

The next step in this study was to compare the fertilization of farmers who complied with acreage allotments with those who did not. Eighty-five of the original 95 commercial potato growers stated definitely that they were either under or over their respective acreage allotments. Fifty-nine farmers were under while 26 were over their alloted acreage. Operators of farms that were under allotments gave different reasons for complying. Thirty farmers stated that they were under acreage allotments in order to qualify for price supports or to go along with the government program. Twenty-nine farmers gave such reasons as: the acreage allotment just happened to fit their rotation;

the size of field to be planted happened to be under the allotment; the acreage allotment was larger than they had planned to plant; and mere coincidence. These two groups were handled separately and are referred to in the remainder of this study as Group 1, those under their allotments intentionally, and Group 2, those under their allotments accidentally. The groups that were finally arrived at to further test the effect of the changed price support program on fertilization, therefore, were as follows:

Group 1. Potato growers who were under their allotments intentionally.

Group 2. Potato growers who were under their allotments accidentally.

Group 3. Potato growers who were over their acreage allotments.

Farmers intentionally under allotments (Group 1) were assumed to have reduced acreage. The original hypothesis for the study was that this group would have increased fertilization to offset reduced acreage. The farmers over acreage allotments, Group 3, were not expected to change fertilization. As far as they were concerned, land for potatoes was not rationed by allotments. Since the farms in Group 2 were under their allotments, a reduction in average acreage was anticipated. The average change in fertilization for the farms under allotments accidentally (Group 2) was expected to be between the changes made by Groups 1 and 3.

General Information

There were 30 farms under allotments intentionally (Group 1), 29 farms under allotments accidentally (Group 2), and 26 farms over allotments (Group 3). The average size of farms in the three groups differed only about 11 percent. Group 1 averaged 183 acres per farm while Group 3 averaged 163 acres. Group 2 fell about half way in between these two groups, averaging 175 acres per farm (Table IV). Each farmer had been asked the approximate number of bushels of potatoes produced in 1949 and the average bushels of potatoes usually sold. The 24 farms in Group 1 for which this information was recorded, produced 3,458 bushels in 1949 and usually sold approximately 3,680 bushels. This indicates that their 1949 potato crop was smaller than usual.[13] The farms in Group 3 produced about the same amount of potatoes as Group 1. The eighteen farms giving this information produced an average of 3,887 bushels per farm in 1949 and usually sold about 3,417 bushels. Group 2, with more acreage in potatoes, had averaged 6,662 bushels produced in 1949 and usually sold on the average of about 6,000 bushels per farm.

Change in Potato Acreage

Definite changes were made in the number of acres grown by each group from 1949 to 1950. Farms under allotments intentionally (Group 1)

13. Farmers usually have a number of bushels of culls that are not sold due to imperfections of some kind. The average bushels of potatoes usually sold, therefore, would be somewhat less than the average number of bushels usually produced. Thus, the average number usually sold does not represent the average total production.

TABLE IV. GENERAL INFORMATION FOR THE FARMS RAISING POTATOES --BY COMPLIANCE WITH ACREAGE ALLOTMENTS

	GROUP 1	GROUP 2	GROUP 3
Number of farms	30	29	26
Average size of farms	183.12	175.41	163.27
Average bushels of potatoes produced in 1949 *	3,457.92	6,662.00	3,886.72
Average bushels of potatoes usually sold *	3,682.29	5,986.00	3,416.67

* These are the averages of farms for which estimates of both the 1949 production and amounts usually sold were available. They represent 24 farms in Group 1, 25 farms in Group 2, and 18 farms in Group 3

decreased total acreage by 10.3 percent. At the same time, farms whose operators had claimed to be under allotments accidentally, increased acreage 8.5 percent. The farms exceeding acreage allotments (Group 3) jumped total potato acreage 16.7 percent. Apparently the farmers who intentionally complied with government allotments reduced their acreage of potatoes by the amount that the Secretary of Agriculture requested. The obvious question was, how could those in Group 2 be under their allotments and still increase potato acreage in 1950? As stated earlier in this thesis it is the opinion of the writer that the acreage allotments for potatoes could have been shuffled in such a manner as to defeat the original purpose of the program.[14] It may have been that the historical data on which the allotments were based allowed these farms more acreage in 1950 than they grew in 1949. It is difficult to believe, however, that a farm growing 20 acres of potatoes in 1949 would have had an average high enough to warrant an allotment of 66 acres in 1950. According to the survey data this happened on one of the farms in Group 2.[15]

Use of Commercial Fertilizer

There were major changes in the amounts of fertilizer used by farms under acreage allotments (Groups 1 and 2). Farms under allotments accidentally (Group 2) stepped up the average rate of fertilization 128

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14. The original purpose of acreage allotments was to help stabilize prices by reducing acreage which was expected to reduce production.

15. Allotments are made to ownership tracts by the P. & M.A. office. The farm mentioned here had rented land both years. There is a possibility that different fields could have been rented in 1950 than in 1949. If so, these different rented acres may have received much more total acreage in allotments, although this seems highly improbable.

TABLE V. POTATO ACREAGE AND COMMERCIAL FERTILIZATION IN 1949 and 1950 AND CHANGES OCCURRING FROM 1949 to 1950 -- BY COMPLIANCE WITH ACREAGE ALLOTMENTS

	GROUP 1			GROUP 2			GROUP 3		
	1949	1950	Percent Change	1949	1950	Percent Change	1949	1950	Percent Change
Total number of farms	30	30		29	29		26	26	
Number of farms using fertilizer	28	29	+3.57	26	26	0.00	23	21	-8.70
A. Acreage									
Total acres grown	426.80	382.90	-10.29	592.70	643.35	+8.55	368.50	430.00	+16.69
Average acres grown	14.23	12.76		20.44	22.18		14.17	16.54	
B. Rate of Fertilization									
Percent of crop fertilized	96.18	98.69	+2.61	96.71	98.07	+1.41	92.40	90.93	-1.59
Average pounds per acre fertilized	597.44	658.51	+10.22	647.94	776.37	+19.80	654.11	613.34	-6.60
Average units per acre fertilized	169.66	190.91	+12.50	180.31	215.76	+19.70	179.93	167.28	-7.60
Average units per cwt. of commercial fertilizer	28.40	28.99	+2.10	27.83	27.79	-0.10	27.51	27.27	-0.90

pounds and Group 1 raised its average 61 pounds per acre (Table V). It is significant that during the same period farms over allotments (Group 3) decreased average fertilizer used per acre by 41 pounds. This supports the original hypothesis that farmers complying with acreage allotments will tend to apply more fertilizer in order to compensate for reduced acreage.

Change in Levels of Fertilization

The data for the units of plant food used per acre by the various groups show approximately the same results as the pounds per acre data. There was a very definite shift in the units of plant food used per acre by farms under allotments. Groups 1 and 2 greatly increased the percent of acres receiving the high level of fertilization while Group 3 showed little change (Figure 7).

Change in Analysis of Fertilizers Used

There was no significant change in the average units of plant food per hundredweight in any of these groups. The average strength of fertilizers used was about that of 3-12-12 or 27 units per hundredweight.

Use of Barnyard Manure

In the use of barnyard manure Group 1 led the way. The farms in this group covered from two-thirds to three-fourths of the total acreage while Group 3 used barnyard manure on 60.65 percent in 1949 and 52.91 percent in 1950. The potato acreage of the farms in Group 2 received the least barnyard manure as approximately 50 percent of the acres were covered (Figure 8).

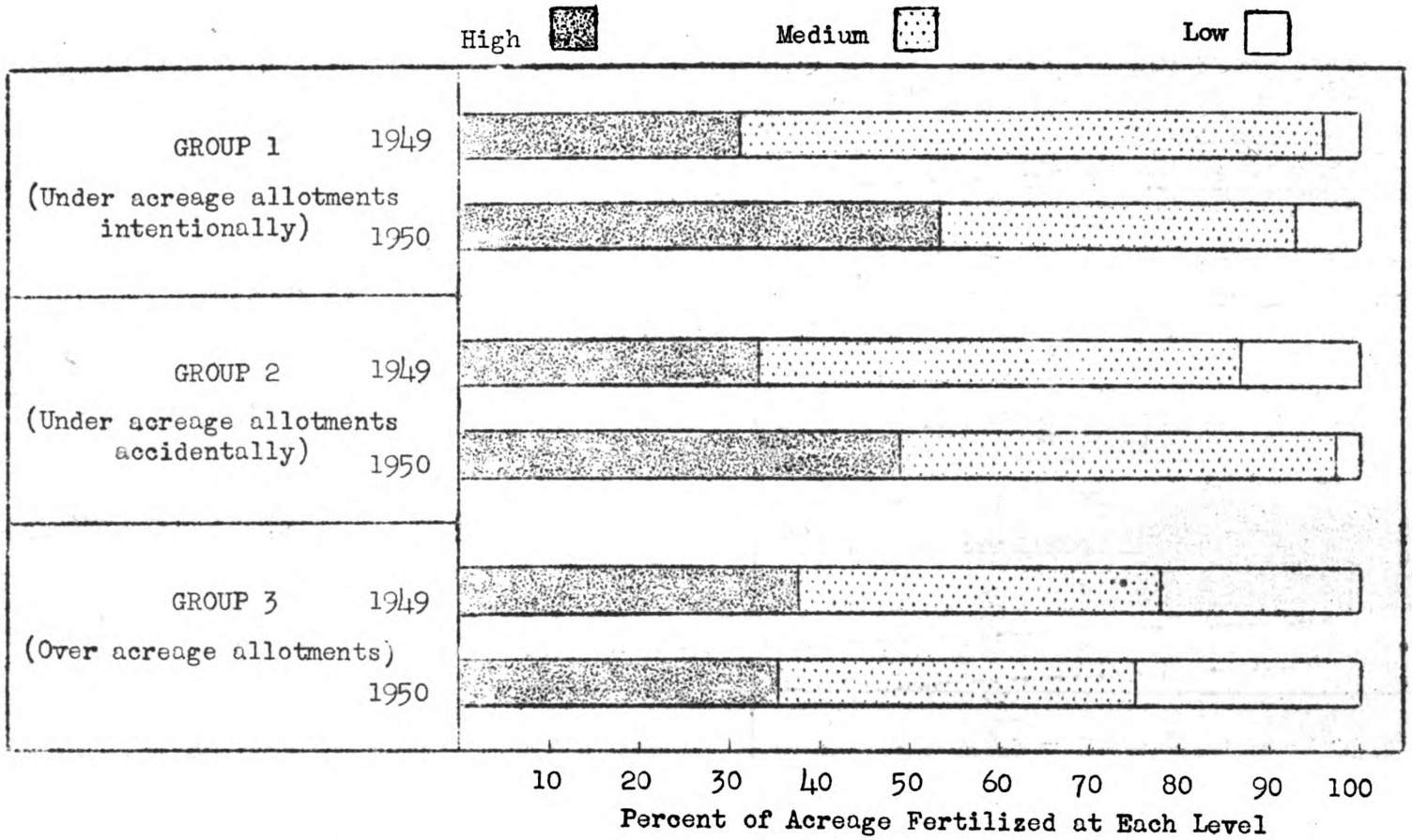
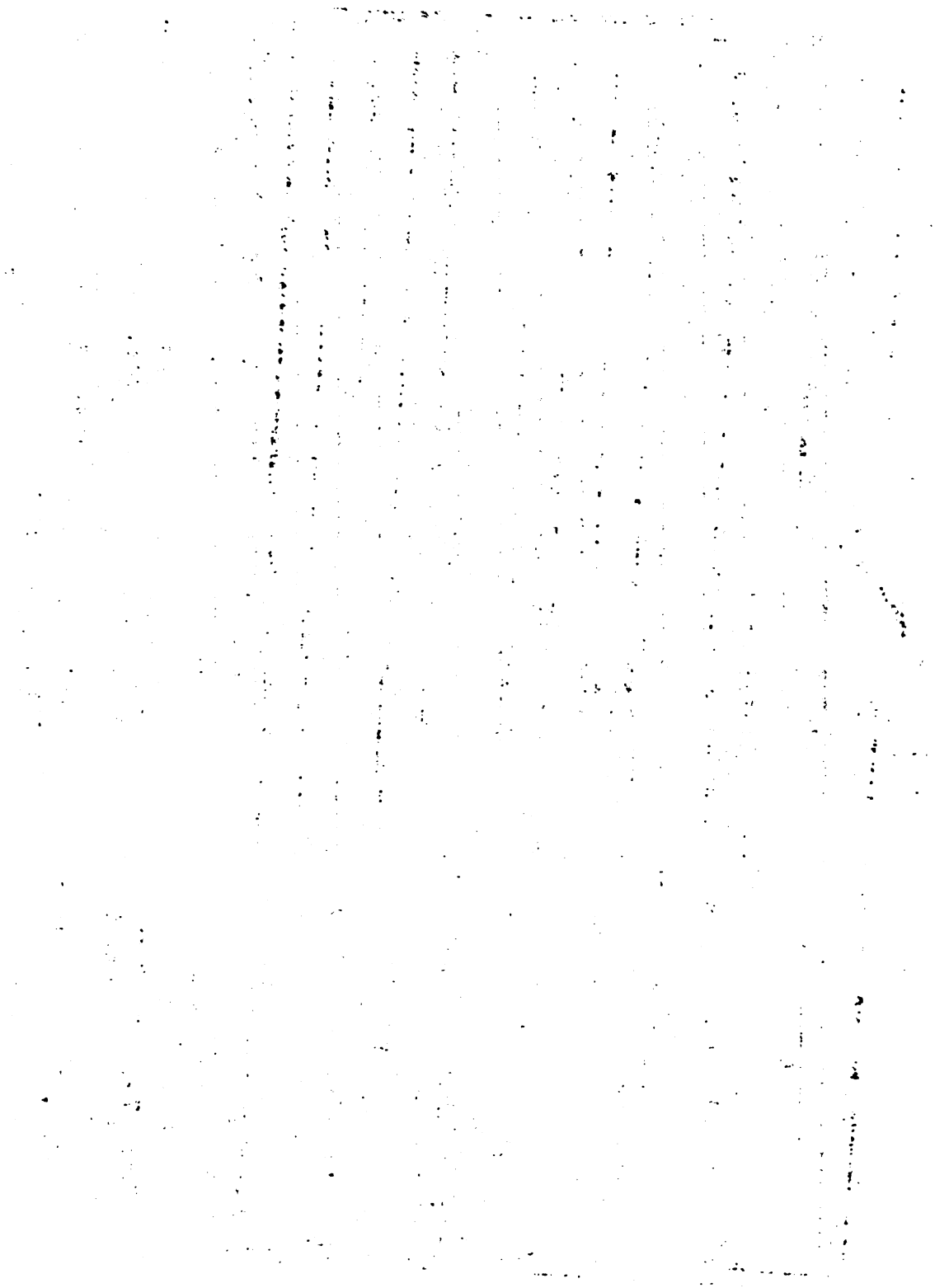


Figure 7. Percent of Acreage in Potatoes Fertilized at Various Levels* in 1949 and 1950, According to Compliance With Potato Acreage Allotments

*Low, 0 to 99 units of plant food per acre; medium, 100 to 199 units; and high, 200 units and over.



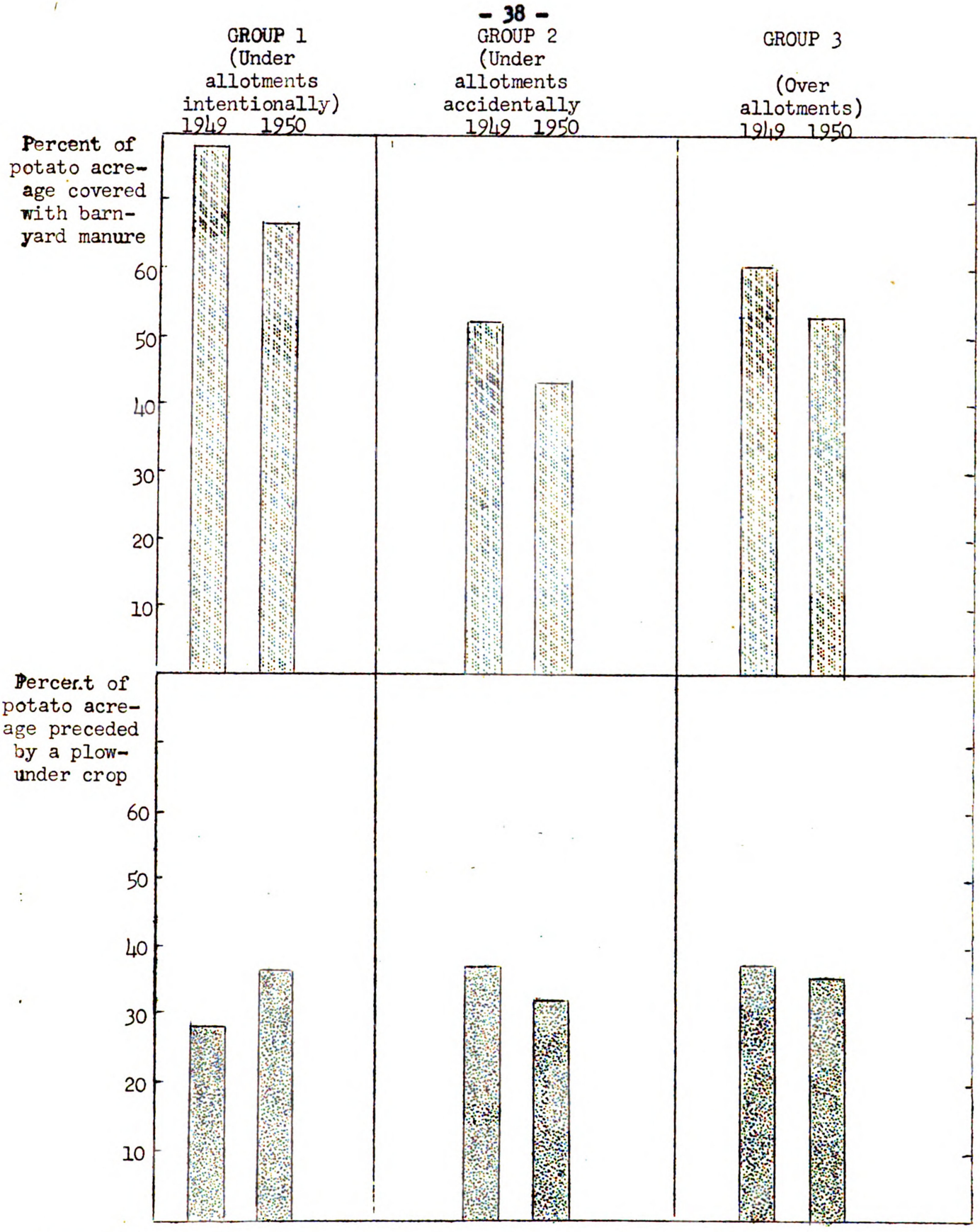


Figure 8. Use of barnyard manure and plow-under crops in potato fertilization in 1949 and 1950, by groups according to compliance with potato acreage allotments.

The potato farmers interviewed used barnyard manure mostly for potatoes. On the majority of the farms visited, barnyard manure was spread primarily on corn ground.

Use of Plow-Under Crops

Green manure crops preceded approximately 50 to 60 percent of all potato acreage in both 1949 and 1950 (Figure 8). There was no significant variation by groups. It should be noted that plowing under green manure crops for over 50 percent of planted potato acreage is adding considerably to the soil fertility and productivity of the relatively light soils of Montcalm county.

SUMMARY

The results of this study were as expected for fertilization but very much different than anticipated as far as acreage planted was concerned.

Potato farmers who were planning to use price supports in 1950 stepped up fertilization about 18 percent. Their total acreage was the same as in 1949. The farmers who had used price supports in 1949 but were not, at the time of the interviews, planning to use them in 1950, increased fertilization 12 percent. This group increased potato acreage 9 percent. The control group of farms not using price supports either year made no change in fertilization and increased acreage only 2 percent.

The farms under acreage allotments intentionally, had decreased acreage by 10 percent as requested by the Secretary of Agriculture. These farms used 1 percent more fertilizer in 1950 than in 1949. This was the type of attempted substitution of capital for land anticipated in a major hypothesis in this study.

The farms that were said to be under their allotments accidentally, will leave real doubt in the minds of those who read this report since they increased acreage 8.55 percent. No absolute proof can be given as such, but it is believed that the manner in which the acreage allotments are handled permits the farms geared for potato production to keep on producing without acreage reduction.

On the farms that planted potatoes in excess of allotments, the fertilization and acreage changes were almost exactly opposite to those on farms intentionally under allotments. Farms over allotments increased acreage 17 percent and, at the same time, decreased the application of commercial fertilizer by 7 percent. Both of these changes were proven to be statistically significant.

The final results from the first portion of this study show that farms using price supports on potatoes in 1950 increased fertilization significantly but failed to reduce acreage. Farms not using price supports either year, the control group, made no change in either fertilization or acreage.

The results of the second portion of this study were that farms intentionally under potato allotments in 1950 increased fertilization and decreased acreage. Those farms over allotments decreased fertilization and increased total potato acreage.

CHAPTER III

CHANGES IN WHEAT FERTILIZATION IN MICHIGAN

By Farms According to Use of Price Supports and Compliance with Acreage Allotments in 1950

Although Michigan is not a major wheat producing state wheat is an important cash crop for many Michigan farmers. In 1950 one-third of the total cash receipt from the sale of field crops came from wheat.[16] More farmers sell wheat than any other cash crop grown in Michigan and therefore have an interest in what happens to its price.

Wheat has many supplementary and complementary relationships with other crops in rotations used on Michigan farms. In rotations where wheat follows early harvested row crops such as beans, silage corn, or soy beans, the wheat can be sown with a minimum of tillage operations. In a rotation with late harvested row crops like corn for grain, or sugar beets, oats follow the row crop and wheat often follows oats. If a farmer wishes to break up a sod for reseeding he can often plow early, summer fallow, sow wheat, and reseed the following spring. Wheat can either be sold or fed to livestock thus giving some flexibility to the choice of enterprise combinations.

Most of the decisions on production practices to be followed for wheat are made prior to planting time. Since all wheat grown in Michigan is winter wheat, the 1950 wheat crop was planted in the fall of 1949. This was far ahead of the outbreak of fighting in Korea and

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16. Michigan Price Report Bureau of Agricultural Economics, U.S.D.A. Lansing, August, 1951.

the rise of agricultural prices (Figure 2). Some spring top dressing of wheat is practiced but it can be assumed that practically all of the commercial fertilizer that was applied to the 1950 wheat crop was applied at the time of planting.

It was believed that changes in the acreage and fertilization of wheat from 1949 to 1950 would show effects of the price support program on production practices used on Michigan farms. This phase of the study will be devoted to the analysis of these changes.

FARMS GROUPED BY INTENDED USE OF PRICE SUPPORTS

In order to measure possible changes in production practices brought about by the price support program, the farms raising wheat were first grouped according to intended use of price supports for wheat in 1950.

Group A. Farms whose operators planned to use price supports for their 1950 wheat crops.

Group B. Farms whose operators had used price supports for wheat in 1949 but were not planning to use them in 1950.

Group C. Farms whose operators had not used price supports for wheat in 1949 and were not planning to use them in 1950.

There were 333 farms in the survey that had grown wheat in both 1949 and 1950. Of this number, 271 usually sold wheat, and 52 fed all

wheat produced to livestock. Only farms that usually sold wheat were included in this phase of the study.

General Information

A great difference was noted in the use of price supports for wheat as compared with potatoes. Only 8 percent planned to use price supports in 1950 (Group A). About 13 percent of the farms were changing from supports to no supports (Group B), and the remaining 79 percent which did not use price supports either year comprised Group C.

The farms in Groups A and C averaged about the same size, while those in Group B were considerably larger (Table VI). Either the larger operators were not interested in cutting acreage in 1950 to qualify for price supports, or the expected difference in price, after the outbreak of war in Korea, did not seem to justify the extra trouble of getting price supports. The larger producers in each of these studies seemed to be more conscious of changes in prices, etc.

Change in Acreage

The Korean affair could not have affected wheat acreage planted in the fall of 1949. This is important, as there were major changes in acreage planted. Group A reduced acreage about 16 percent and Group B reduced acreage approximately 13 percent. These were significant changes. At the same time, Group C showed no change between acreage grown in 1949 and 1950 (Table VII).

TABLE VI. GENERAL INFORMATION FOR THE FARMS RAISING WHEAT -- BY USE OF PRICE SUPPORTS

	GROUP A	GROUP B	GROUP C
Number of farms	23	34	214
Average size of farms	188.17	252.96	180.12
Average bushels of wheat produced in 1949*	785.47	1036.50	592.29
Average bushels of wheat usually sold*	580.26	789.42	459.05

* These are averages of farms for which estimates of both the 1949 production and amounts usually sold were available. The represent 19 farms in Group A, 26 farms in Group B, and 189 farms in Group C.

TABLE VII. WHEAT ACREAGE AND COMMERCIAL FERTILIZATION IN 1949 and 1950 AND CHANGES OCCURRING FROM 1949 to 1950 --BY USE OF PRICE SUPPORTS

	GROUP A			GROUP B			GROUP C		
	1949	1950	Percent Change	1949	1950	Percent Change	1949	1950	Percent Change
Total number of farms	23	23		34	34		214	214	
Number of farms using fertilizer	22	22	0.00	31	32	+3.22	185	183	-0.11
A. Acreage									
Total acres grown	631.00	532.20	-15.65	1148.20	1003.70	-12.58	4572.90	4551.70	-0.46
Average acres grown	27.43	23.14		34.79	29.52		21.37	21.27	
B. Rate of Fertilization									
Perdent of crop fertilized	89.54	94.93	+6.02	95.60	93.37	-2.33	85.95	85.33	-0.72
Average pounds per acre fertilized	224.54	232.63	+3.60	220.39	209.58	-4.90	216.48	215.32	-0.54
Average units per acre fertilized	54.24	60.54	+11.63	56.06	56.05	-0.02	51.41	53.79	+4.63
Average units per cwt. of commercial fertilizer	24.16	26.03	+7.74	25.44	26.74	+5.11	23.75	24.98	+5.18

Use of Commercial Fertilizer

The changes in fertilization were not as striking as for potatoes. However, there were changes that must be recognized (Table VII). Of the 23 farms planning to use price supports (Group A), 22 used fertilizer both years. Of the total wheat acreage 90 percent was fertilized in 1949 as compared with 95 percent in 1950. This group used 8 pounds or 4 percent more fertilizer as well as 8 percent higher analysis fertilizers. This made a total increase of 12 percent over the level of fertilization used in 1949.

The farms changing from supports to no supports (Group B), used 10 pounds less fertilizer per acre on the average, but due to the use of stronger fertilizers, made no change in units of plant food per acre. In the group not using price supports either year (Group C) the 185 farms that used commercial fertilizer in 1949 averaged 216 pounds per acre fertilized which was almost identical with the 215 pounds per acre used by 183 farms in 1950. Although there was no significant change in pounds per acre, there was an increase in units of plant food accounted for by the use of fertilizers with higher analyses.

Change in Analysis of Fertilizers Used

All three groups used fertilizers with higher analyses in 1950 than in 1949 (Table VII). Much more 3-12-12 was used and less 2-12-6. Nineteen-fifty was the first year that more 3-12-12 was sold in Michigan than 2-12-6. (Appendix B).

Change in Levels of Fertilization

There was a definite shift in the levels of fertilization by Group A. This was partially due to a 5 percent larger portion of the total wheat acreage getting some fertilizer (Figure 9). Little change was noted in Groups B and C. The three levels established for this comparison were: low, 0 to 44 units of plant food per acre; medium, 45 to 74 units; and high, 75 units and over.

Use of Barnyard Manure

Farmers did not usually use manure on wheat ground. Less than 20 percent of the total wheat acreage was covered in either 1949 or 1950 (Figure 10). Group C used slightly more manure in 1949 than the other two groups. Group A covered less acreage than Groups B and C in 1950.

Use of Green Manure

Less than 10% of the total wheat acreage of the farms in this survey was preceded by a plow-under crop (Figure 10). Group A increased the acres of green manure used from 4 percent in 1949 to 12 percent in 1950. Groups B and C showed little change. The total acres of green manure used are so small that the changes lack sigificance. Wheat must be planted in the fall in Michigan and green manure crops have not been used extensively ahead of the wheat crop in many rotations.

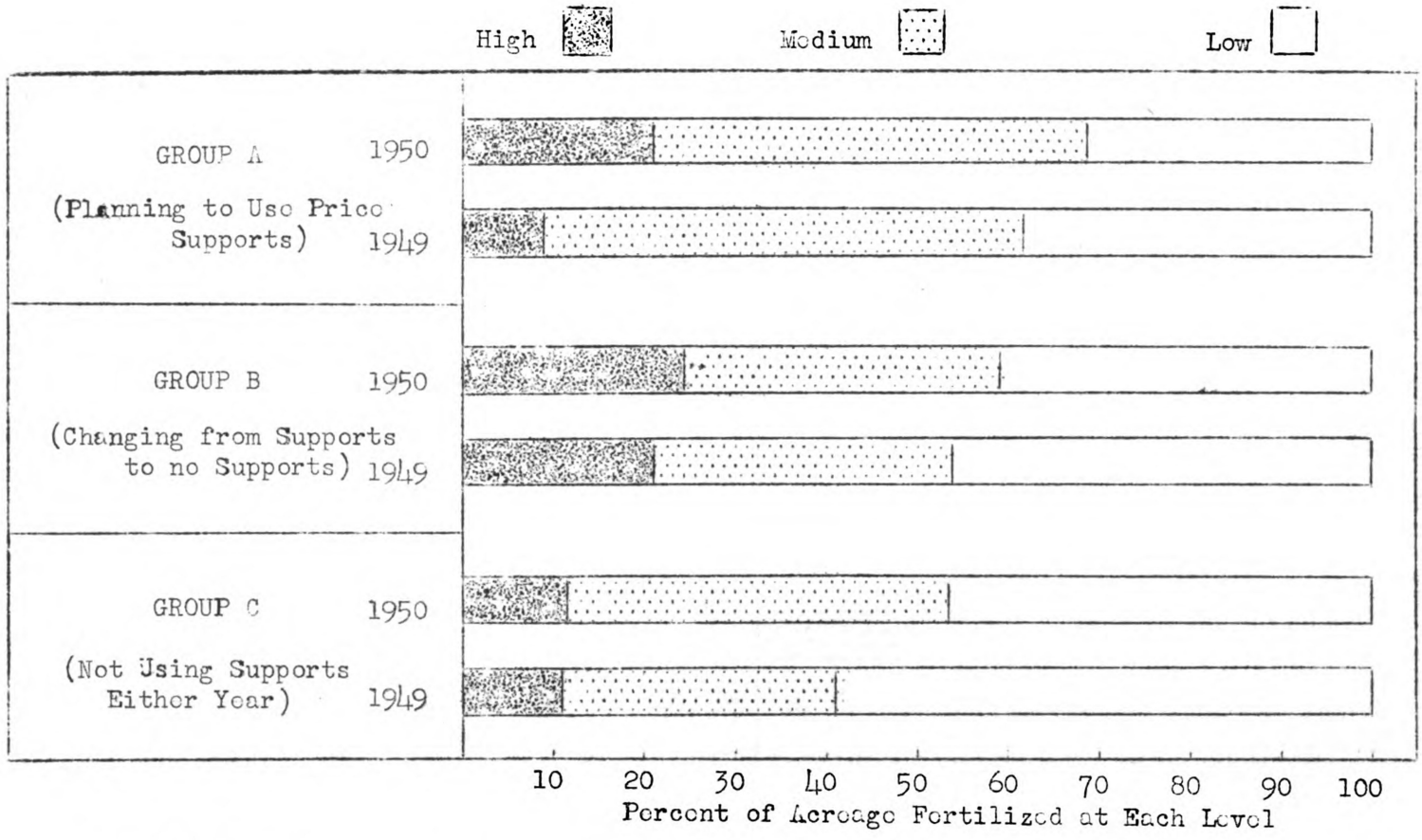


Figure 9. Percent of Acreage in Wheat Fertilized at Various Levels* in 1949 and 1950, By Use of Price Supports in 1950

*Low, 0 to 44 units of plant food per acre; medium, 45 to 74 units; and high, 75 units and over.

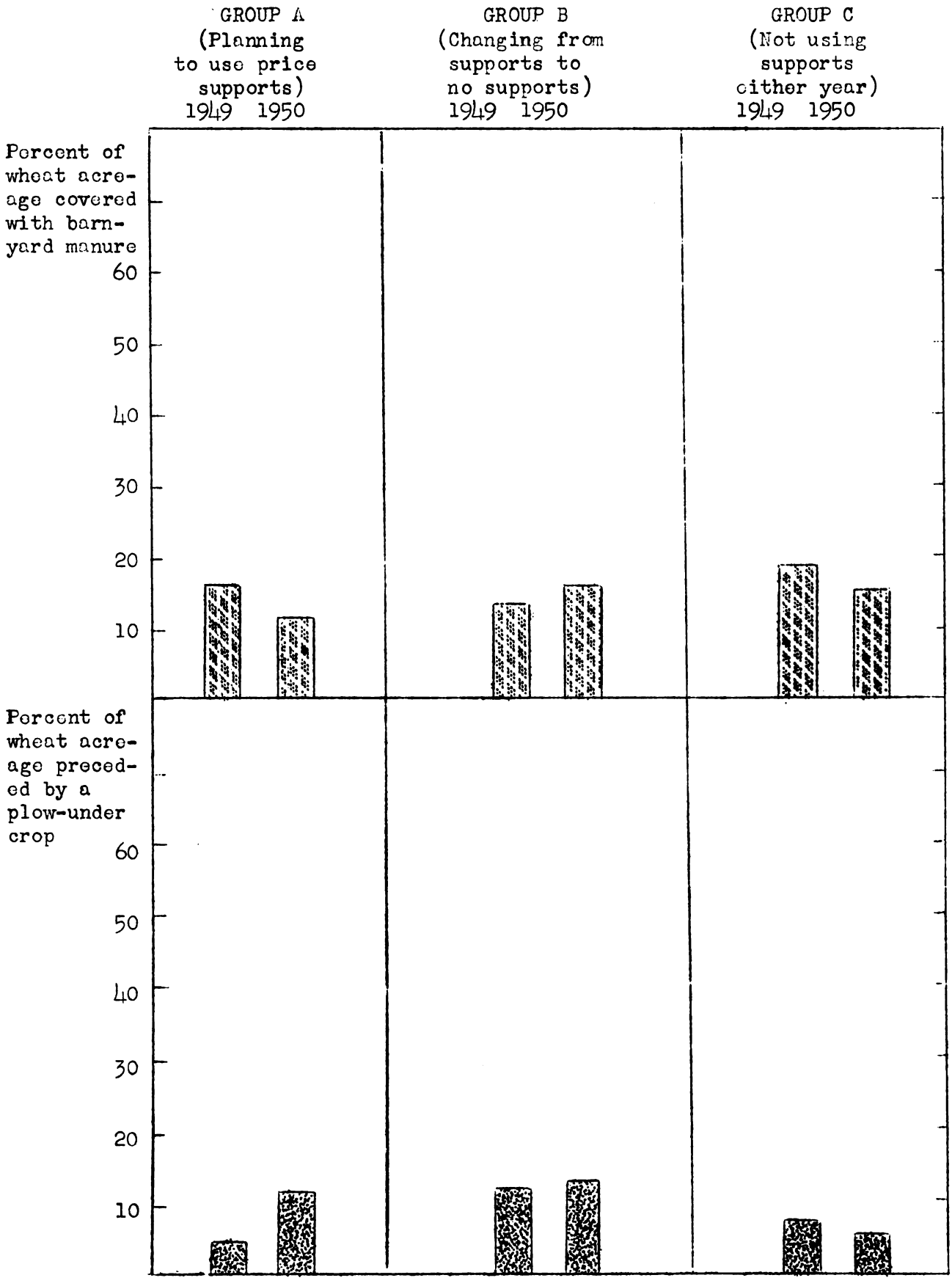


Figure 10. Use of barnyard manure and plow-under crops in wheat fertilization in 1949 and 1950, by use of price supports in 1950.

FARMS GROUPED BY COMPLIANCE WITH ACREAGE ALLOTMENTS

The second portion of this study deals with acreage allotments and their effect on wheat acreage on fertilization. The farmers were grouped as follows:

Group 1. Wheat growers who were under their allotments intentionally.

Group 2. Wheat growers who were under their allotments accidentally.

Group 3. Wheat growers who were over their acreage allotments.

General Information

Of the 271 farms that usually sold wheat 255 were definitely known to be either under or over their allotments. (Table VIII). About 40 percent, 109 farms, were under allotments, and about 60 percent, 150 farms, were over allotments. Of those that had complied, 38 were under allotments intentionally (Group 1) and 67 accidentally (Group 2). The farms in Group 1 averaged 229 acres in size, those in Group 2, 169 acres, and in Group 3, 192 acres. Groups 1 and 3 usually sold about 30 percent more wheat than Group 2.

Change in Acreage

There were major changes in the acres grown by the three groups from 1949 to 1950. Group 1 reduced acreage 11 percent and Group 2 reduced acreage 12 percent (Table IX). The farms in Group 2 increased acreage 7 percent. None of these groups decreased acreage by as much as the 19 percent which was the reduction requested by the Secretary

TABLE VIII. GENERAL INFORMATION FOR THE FARMS RAISING WHEAT -- BY COMPLIANCE WITH ACREAGE ALLOTMENTS

	GROUP 1	GROUP 2	GROUP 3
Number of farms	38	67	150
Average size of farms	228.63	168.52	192.42
Average bushels of wheat produced in 1949*	680.03	514.02	726.63
Average bushels of wheat usually sold*	513.43	392.82	570.56

* These are averages of farms for which estimates of both the 1949 production and amounts usually sold were available. The represent 32 farms in Group 1, 55 farms in Group 2, and 133 farms in Group 3.

TABLE IX. WHEAT ACREAGE AND COMMERCIAL FERTILIZATION IN 1949 AND 1950 AND CHANGES OCCURRING FROM 1949 to 1950 --BY COMPLIANCE WITH ACREAGE ALLOTMENTS

	GROUP 1			GROUP 2			GROUP 3		
	1949	1950	Percent Change	1949	1950	Percent Change	1949	1950	Percent Change
Total number of farms	38	38		67	67		150	150	
Number of farms using fertilizer	33	34	+3.03	61	62	+1.63	132	130	-1.51
A. Acreage									
Total acres grown	1075.60	959.90	-10.75	1417.00	1116.70	-21.19	3505.20	3748.10	+6.93
Average acres grown	28.31	25.26		21.15	16.67		23.37	24.99	
B. Rate of Fertilization									
Percent of crop fertilized	87.17	87.42	+0.29	91.15	91.30	+0.16	89.20	88.68	-0.58
Average pounds per acre fertilized	234.26	221.74	-5.34	217.89	222.74	+2.23	206.36	206.84	+0.24
Average units per acre fertilized	57.55	60.42	+4.99	51.53	56.96	+10.54	49.06	51.50	+4.97
Average units per cwt. of commercial fertilizer	24.57	27.25	+10.91	23.65	25.57	+8.12	23.77	24.90	+4.75

of Agriculture (Table I). Although the farms in Group 2 were allegedly under their allotments accidentally, 5 definitely planned to use price supports in 1950, 2 were considering their use, and a total of 12 had used price supports for wheat in 1949.

Use of Commercial Fertilizer

Changes in pounds of fertilizer used were relatively small. However, there were larger differences in units of plant food used per acre (Table IX). Of the 38 farms under allotments intentionally, there were 33 farms using commercial fertilizer in 1949 and 34 in 1950. The percent of wheat acreage fertilized was the same for both years. The pounds per acre used show a 5 percent decrease, but the use of higher analysis fertilizers brought about a 5 percent increase in the units of plant food used per acre. Of the 67 farms under allotments accidentally, 61 had used fertilizers in 1949 and 62 in 1950. A total of 91 percent of the total acreage of this group was fertilized both years. About 5 more pounds and 5 additional units of plant food were used per acre in 1950 than in 1949. This made an 11 percent increase in actual plant food. Much of this increase was again due to the use of higher analysis fertilizers. The farms over allotments used the same average amounts of fertilizer in 1950 and in 1949. The use of higher analysis fertilizers, however, brought about a 5 percent increase in units of plant food spread per acre. Of the 150 farms in this group, 132 covered 89 percent of the total wheat acreage in 1949, and 130 used fertilizer on 89 percent of the wheat ground in 1950.

The striking similarity among the three groups was that less than 1 percent change was made in the percent of acreage fertilized from 1949 to 1950.

Change in Levels of Fertilization

All three groups show shifts in levels of fertilization (Figure 11). Groups 1 and 3 increased units of plant food used per acre 5 percent and Group 2 increased 11 percent. As stated previously these increases in units of plant food were due to the use of fertilizers of higher analysis.

Use of Barnyard Manure

Only a small share of the total wheat acreage was covered with manure (Figure 12). Group 1 covered about 18 percent of its wheat acreage both years. Group 3 used manure on less acreage but was consistent with 13 percent of the wheat land in 1950 and 14 percent in 1949 being covered. Only Group 2 showed much change. Of the total acreage for this group 28 percent was covered in 1949 and 18 percent in 1950. No measure was attempted of the tons spread per acre.

Use of Plow-Under Crops

Plow-under crops were used on only a small percentage of the total wheat acreage and the figures can not be considered as having much significance. The percent of total acres preceded by a plow-under crop for each group is shown in Figure 12.

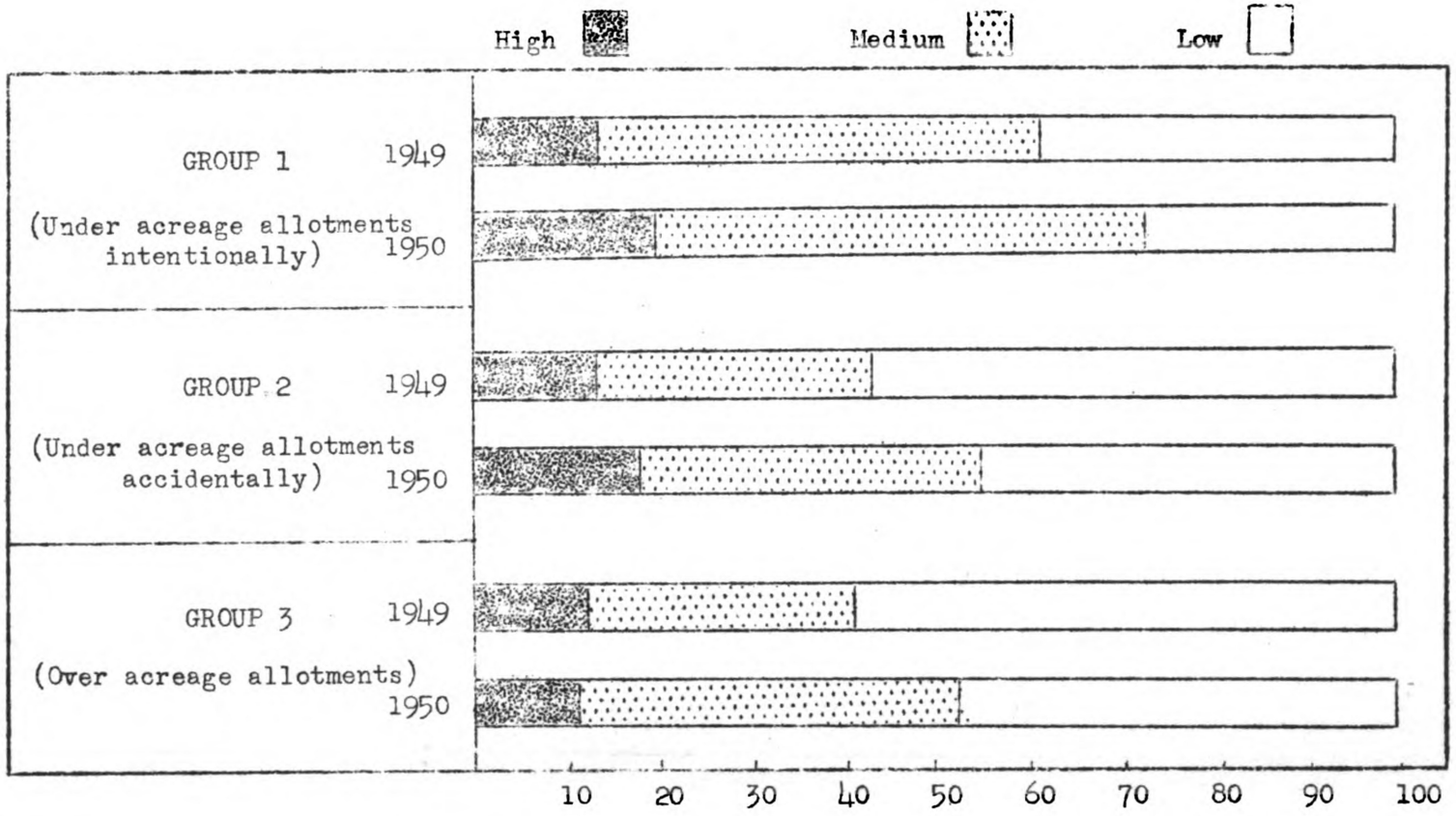
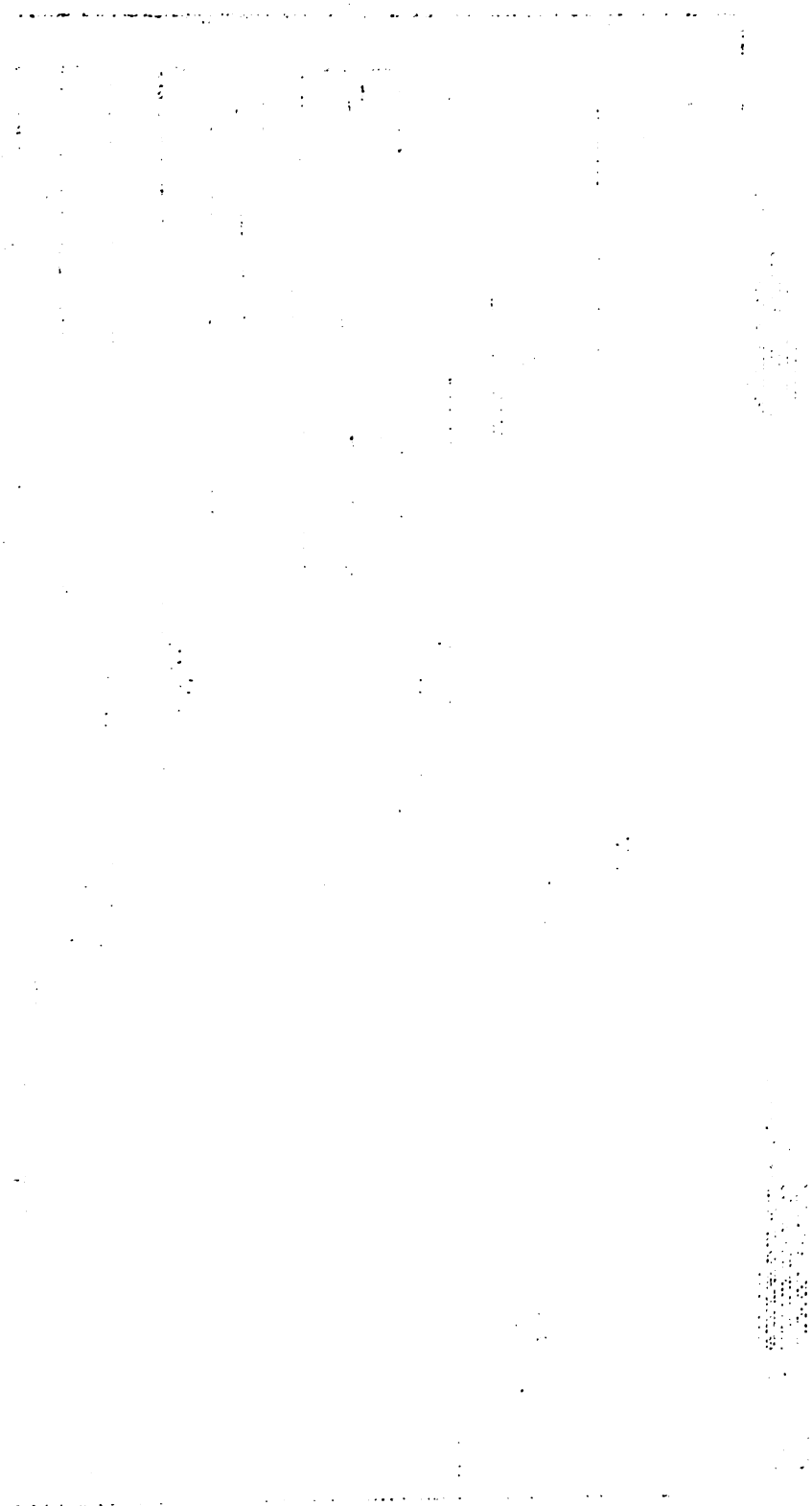


Figure 11. Percent of Acreage in Wheat Fertilized at Various Levels* in 1949 and 1950, According to Compliance With Wheat Acreage Allotments

*Low, 0 to 44 units of plant food per acre; medium, 45 to 74 units; and high, 75 units and over.



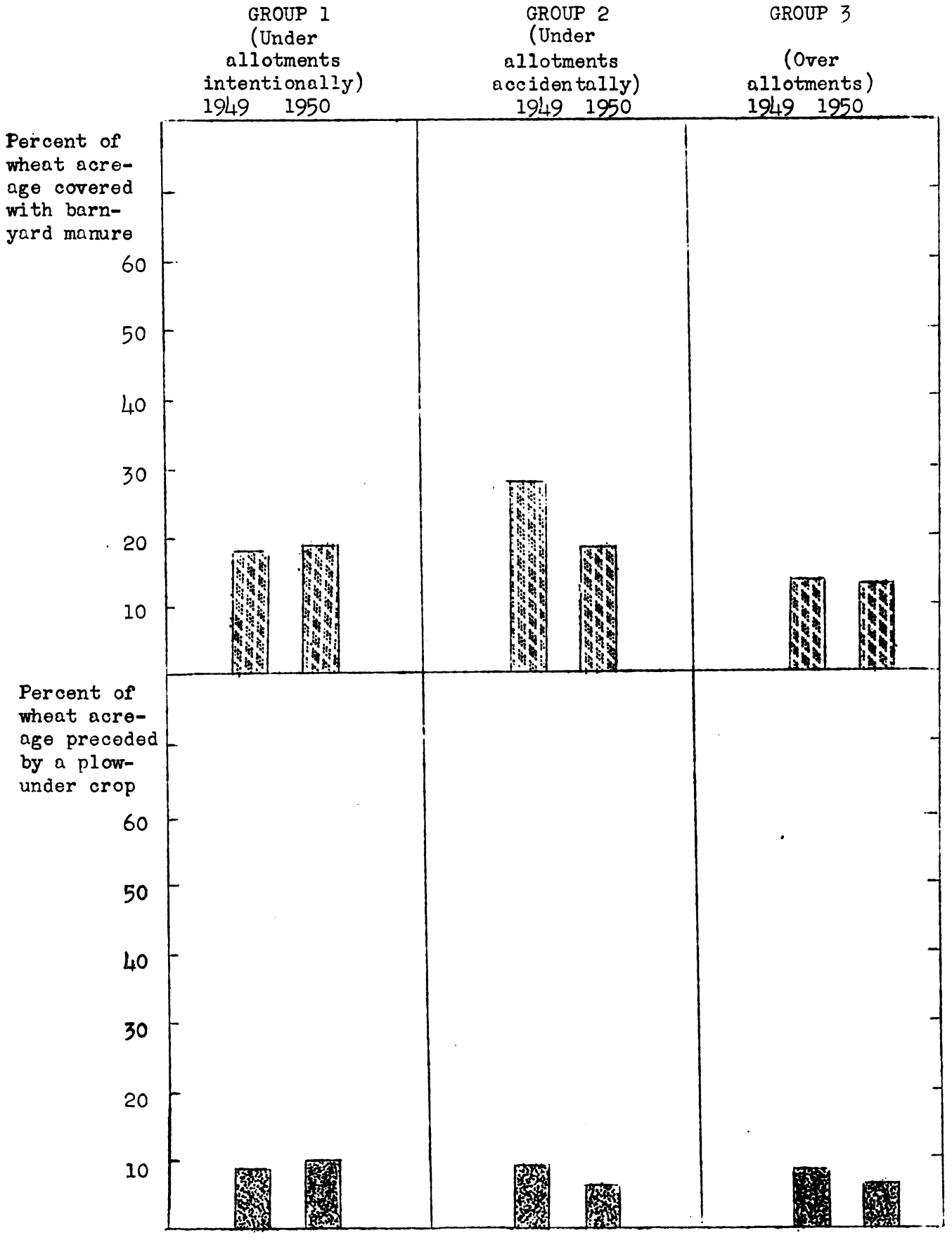


Figure 12. Use of barnyard manuro and plow-under crops in wheat fertilization in 1949 and 1950, by groups according to compliance with wheat acreage allotments.

SUMMARY

The farms that were planning to use price supports reduced acreage 16 percent and increased the average amount of units of plant food used per acre 18 percent. Farms changing to no supports decreased acreage 13 percent but showed little change in fertilization. Farms not using price supports either year held acreage constant and used the same amounts of fertilizer in terms of pounds in 1950 as were used in 1949. However, the use of fertilizers of higher analyses gave this group a small increase in units of plant food used per acre. Very little barnyard manure or green manure was used on wheat.

In the second half of the wheat study there were only minor differences in the amounts of fertilizer used by each group. However, farms under allotments intentionally, and those under allotments accidentally, decreased acreage 11 percent and 12 percent respectively while farms over allotments increased total wheat acreage 7 percent from 1949 to 1950.

The farms planning to use price supports have decreased acreage and increased fertilization while farms not using price supports made little change. This supports the original hypothesis of the study. When the farms were sorted according to compliance with acreage allotments the evidence appeared less conclusive but the tendency was in the same direction.

CHAPTER IV

CHANGES IN BEAN FERTILIZATION IN MICHIGAN

By Farms According to Use of Price Supports and Compliance with Acreage Allotments in 1950

The purpose of this phase of the study is to determine the effect of price supports and acreage allotments on the fertilization of beans. Price supports for dry beans were not mandatory under the Agricultural Act of 1949. However, Secretary Brannan saw fit to include them under the protection that price supports afford to producers.

Effective operation of any price support program requires a practical balance between supplies and requirements. The all-time record crop of 20 million bags in 1949 put a large supply of beans in storage. It was estimated that a carry-over of 10,150,000 bags would be on hand on September 1, 1950, when the 1950 crop started rolling to market. It was deemed necessary to reduce production in order to shrink this tremendous carry-over of beans. Since the price mechanism was not allowed to function freely, it was necessary to reduce production by reducing acreage. Therefore, acreage allotments were placed on bean growers allowing approximately 80 percent of their normal acreage.

> "With the price-support-acreage-allotment program in effect, and assuming good cooperation by producers and average yields, the 1950 crop will likely total around 13,000,000 bags, cleaned basis. Adding the estimated carry-over as of September 1, 1950, of 10,150,000 bags, and probable imports of 50,000 bags in 1950-51, gives a total supply of 23,200,000 bags for the year ending September 1, 1951.

"Domestic disappearance and exports for this same period are estimated as 15,500,000 bags, which would leave a carry-over of 7,700,000 bags on September 1, 1951. This reserve is probably more than would be necessary to stabilize supplies at the contemplated levels of production and consumption. But experience has proved that dry bean yields may fluctuate considerably from year to year, and the size of the 1950 crop could vary substantially from the estimate."[17]

The 1950 crop did vary substantially from the estimate. Instead of 13,000,000 bags of beans, approximately 15,128,000 bags were produced in 1950.[18] However, this was a 24 percent decrease from the 1949 crop of 19,890,000 bags. The national acreage also decreased 19 percent[19] which was almost the exact reduction, 20 percent, requested by the Secretary of Agriculture.

FARMS GROUPED BY INTENDED USE OF PRICE SUPPORTS

One hundred seventy of the 578 farmers in this over-all survey grew beans in both 1949 and 1950. In order to measure the effect of the governmental price support program on changes in fertilization the 170 farms were divided into three groups according to intended use of price supports:

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17. Dry Edible Bean Program for 1950, Production and Marketing Administration, United States Department of Agriculture, Washington 25, D.C. March, 1950.

18. Crop Production, Crop Reporting Board of the Bureau of Agricultural Economics, U.S. Department of Agriculture, Washington, D. C. August 10, 1951.

19. Crop Production, (Annual Summary), Crop Reporting Board, Bureau of Agricultural Economics, U.S. Department of Agriculture, Washington, D.C. December, 1950.

Group A. Farms whose operators planned to use price supports for their 1950 bean crops.

Group B. Farms whose operators had used price supports in 1949 but were not planning to use them in 1950.

Group C. Farms whose operators had not used price supports for beans in 1949 and were not planning to use them in 1950.

The farms in Group A were expected to have reduced acreage and increased fertilization. Group B, because of the number of operators in this group who had originally planned to use price supports, was expected to react similarly to Group A. Little change in fertilization was foreseen for Group C.

General Information

Forty-two of the 170 farms were planning to use price supports in 1950 (Group A). Thirty-four had used supports in 1949 but were not planning to use them in 1950, (Group B), and 94 farms, 56 percent, did not use price supports either year and fell into Group C (Table X). There was little variation in average size of farm of the three groups. However, the groups did vary in average bushels of beans usually sold. Group A led with 340 bushels, Group B was second with 305, while the farmers in Group C sold an average of 264 bushels. This would indicate that the larger bean producers are taking greater cognizance of the price support program. All three groups indicated that a larger than average crop had been harvested in 1949. On a national basis, the 1949 bean crop was the largest ever harvested in this country. Many of the

TABLE X. GENERAL INFORMATION FOR THE FARMS RAISING BEANS -- BY USE OF PRICE SUPPORTS

	GROUP A	GROUP B	GROUP C
Number of farms	42	34	94
Average size of farms	168.60	175.00	165.30
Average bushels of beans produced in 1949 *	451.56	401.54	325.55
Average bushels of beans usually sold *	340.34	304.64	263.85

* These are averages of farms for which estimates of both the 1949 production and amounts usually sold were available. They represent 32 farms in Group A, 31 farms in Group B, and 65 farms in Group C.

farmers were pessimistic about the outlook for the 1950 crop.[20]

Changes in Bean Acreage

Farms whose operators were planning to use price supports were expected to have reduced acreages. Those in Group A of the bean study did cut acreage but only by 6 percent (Table XI). The farms that were changing from supports to no supports increased acreage 5 percent. Some of these were believed to have refused to reduce acreage and when compliance with acreage allotments was made a prerequisite for price supports they left the program. The 94 farms in Group C are the ones that seemingly threw a wrench into the production control program. The operators who did not use price supports either year increased production 25 percent over 1949. The total acreage increase of this group was seven times greater than the total acreage decrease of the 34 farms planning to use price supports (Group A).

As was stated in the potato study, the present price support program tends to hold prices up for all producers by taking a quantity of

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20. Just prior to the time that the survey was taken in Sanilac and Saginaw counties, the bean growers had taken a terrible beating by heavy rains and flash floods. The following was printed in the Annual Summary of Crop Production in December, 1950:

"In Michigan, a sharp decrease of 19 percent in the harvested acreage occurred, and the yield was down from 1,100 pounds in 1949 to 950 this year. Production is estimated at 3,312,000 bags compared with 5,502,000 bags in 1949. The crop was planted a little earlier than usual, and the favorable weather which followed resulted in rapid development of the crop. However, beginning in late July, frequent rains, continuing on to the end of the season, drowned out many whole fields and caused such severe damage to others that growers did not consider them worth harvesting."

TABLE XI. BEAN ACREAGE AND COMMERCIAL FERTILIZATION IN 1949 and 1950 AND CHANGES OCCURRING FROM 1949 to 1950 --BY USE OF PRICE SUPPORTS

	GROUP A			GROUP B			GROUP C		
	1949	1950	Percent Change	1949	1950	Percent Change	1949	1950	Percent Change
Total number of farms	42	42		34	34		94	94	
Number of farms using fertilizer	31	35	+12.90	27	27	0.00	72	70	-2.77
A. Acreage									
Total acres grown	938.20	883.41	-5.83	691.00	723.80	+4.75	1544.42	1936.20	+25.38
Average acres grown	22.34	21.01		20.32	21.29		16.43	20.60	
B. Rate of Fertilization									
Percent of crop fertilized	76.18	76.91	+0.96	78.15	76.23	-2.46	71.81	75.58	+5.25
Average pounds per acre fertilized	160.54	170.60	+6.27	133.83	145.06	+8.39	153.36	146.24	-4.64
Average units per acre fertilized	38.80	42.10	+8.51	30.44	35.65	+17.11	39.46	36.54	-7.40
Average units per cwt. of commercial fertilizer	24.17	24.64	+1.94	22.74	24.58	+8.09	25.73	24.99	-2.88

the total production off the market. Thus, when farmers see their neighbors cutting production to go along with the government's control program, it is not uncommon for them to increase their own acreage.

Changes in the Use of Commercial Fertilizer

The expected results were that farms planning to use price supports had increased the use of commercial fertilizer in 1950 while farms not using price supports would have made little change in fertilization.

The farms planning to use price supports, (Group A), used more fertilizer than the other farms in the study (Table XI). This group also increased the average pounds of fertilizer used per acre from 161 pounds in 1949 to 171 pounds in 1950. A significant 11 pound increase in pounds of fertilizer used per acre was made by Group B. These two increases occurred while Group C, which had a 25 percent increase in acreage, decreased the rate of fertilization by 5 percent. This change lacked significance.

Of greater importance were the changes in units of plant food used per acre. Group B used fertilizers that averaged 8 percent higher analysis in 1950 than those used in 1949. Thus the average units per acre for this group, which was also affected by the increased pounds per acre, jumped 17 percent. Group A used only slightly higher analysis fertilizers in 1950, but this change multiplied by the 10 pound increase per acre accounted for an 8.5 percent increase in average units

per acre. The farmers in Group C were using fertilizers of higher analysis. Many of the potato farmers in this study grow beans as an additional cash crop but do not use price supports as much as the bean growners of the Saginaw valley and Sanilac County. However, they buy fertilizers of higher analysis for their potatoes and use these same kinds of fertilizer on their beans.

Changes in Levels of Fertilization

The increases in rates of fertilization made by farms planning to use price supports and those that had used price supports in 1949 are shown graphically in Figure 13. In order to show these changes three relative levels of fertilization were established for beans. These three levels were measured in units of plant food used per acre. Less than 12 units per acre was classified as low; from 12 to 35 units as medium; and 36 units or over as high. These levels interpreted into pounds would be from 0 to 59, 60 to 179, and 180 pounds and over of 2-12-6. If 3-12-12 were being used, the levels would be divided at 44 pounds and 133 pounds per acre. These two analyses were most commonly used on beans on the farms studied. Almost half of the 1950 acreage grown by Group A received 36 or more active units per acre. Approximately 7 percent of the acreage receiving medium amounts of fertilizer in 1949 were shifted to the higher level in 1950. The shift made by Group B, although less apparent, proved to be statistically significant as previously mentioned. Group C appears in Figure 13. to have increased fertilization but the average had actually fallen slightly.

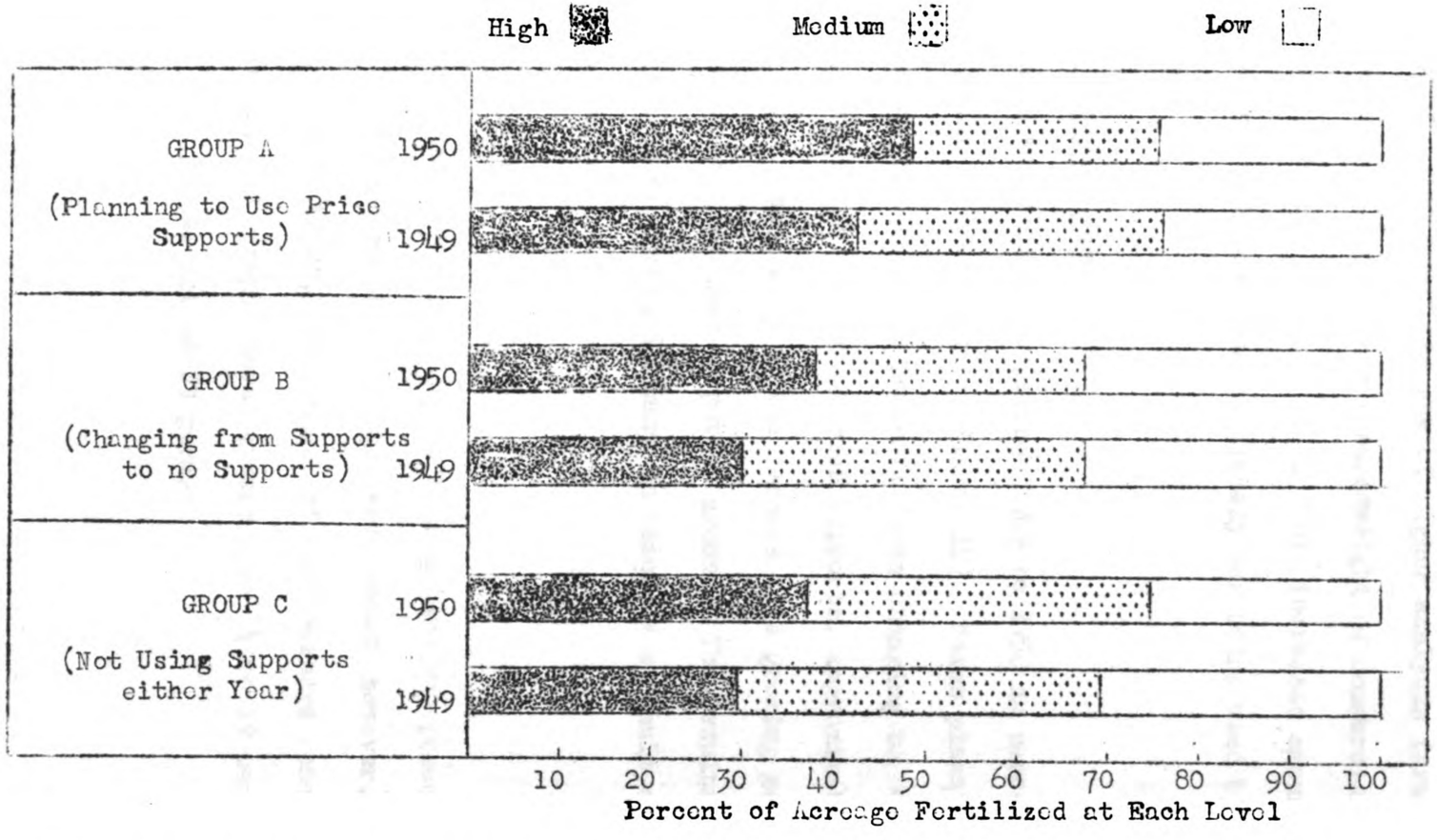


Figure 13. Percent of Acreage in Beans Fertilized at Various Levels* in 1949 and 1950, By Use of Price Supports in 1950

*Low, 0 to 11 units of plant food per acre; medium, 12 to 35 units; and high, 36 units and over.

Change in Analysis of Fertilizers Used

Group B increased the use of higher analysis fertilizers in 1950 and averaged 24.6 units per hundredweight of commercial fertilizer as compared with 22.7 units in 1949. This increased amount, however, was approximately the same as already was being used by the other two groups.

Use of Barnyard Manure

There was little change from 1949 to 1950 in percent of acreage covered with barnyard manure (Figure 14). Farms planning to use price supports covered about 24 percent; farms changing to no supports, 29 percent; and farms not using price supports, approximately 13 percent. In the latter case, many of the farmers were growing potatoes and most of their manure was used on potato ground. The results indicate no change in use of barnyard manure on beans as a result of the price support program.

Use of Green Manure

Less than one quarter of the bean ground was preceded by green manure crops (Figure 14). Changes were noted, however. Group A increased from 22 to 28, the percent of bean acreage receiving plow-under crops, and Group C moved upward from 14 to 19 percent. Group B dropped from 33 percent to 23 percent.

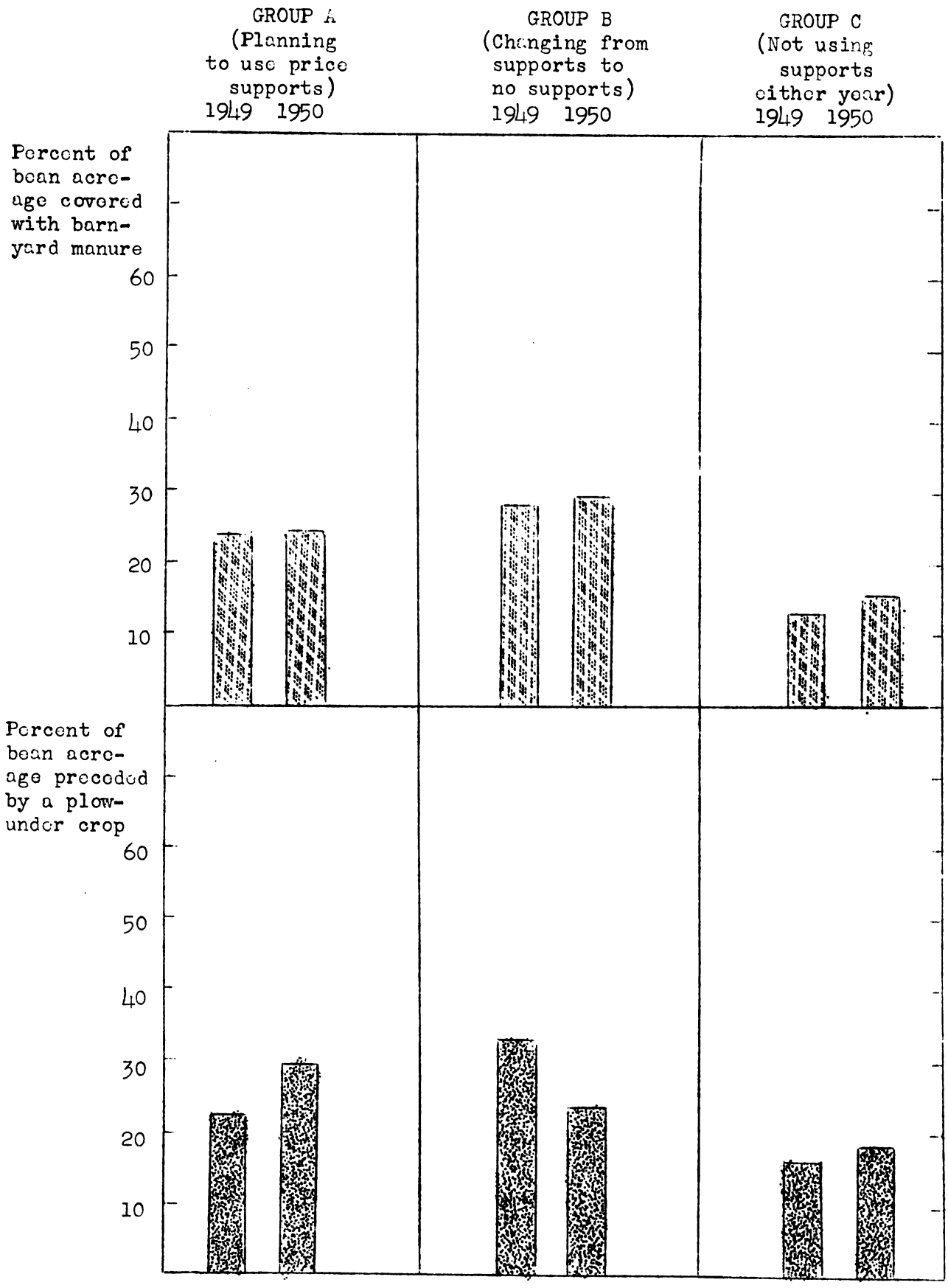


Figure 14. Use of barnyard manure and plow-under crops in bean fertilization in 1949 and 1950, by use of price supports in 1950.

FARMS GROUPED BY COMPLIANCE WITH ACREAGE ALLOTMENTS

Bean acreage allotments were in effect in 1950 following the record crop of 1949. It was expected that farms going along with acreage allotments intentionally, i.e., in order to be eligible for price supports, would have reduced acreage and increased rate of fertilization. In order to test the effect of acreage allotments the farmers were divided into three groups:

Group 1. Bean growers who were under their allotments intentionally.

Group 2. Bean growers who were under their allotments accidentally.

Group 3. Bean growers who were over their acreage allotments.

General Information

A total of 157 of the original 170 bean growers in this study knew their 1950 allotments. They also gave their reasons for being under or over the prescribed acreage for their farms. This permitted the division of these 157 farms into the three groups described above (Table XII). Thirty-one farms were under allotments in order to get price supports or go along with the government program (Group 1). Twenty-five farmers were said to be under allotments by mere coincidence or due to no special planning (Group 2). The big majority of the farms, 101, had planted acreage in excess of their allotments (Group 3).

TABLE XII. GENERAL INFORMATION FOR THE FARMS RAISING BEANS -- BY COMPLIANCE WITH ACREAGE ALLOTMENTS

	GROUP 1	GROUP 2	GROUP 3
Number of farms	31	25	101
Average size of farms	185.71	195.56	160.48
Average bushels of beans produced in 1949*	475.96	380.88	374.92
Average bushels of beans usually sold*	381.25	262.65	275.43

* These are averages of farms for which estimates of both the 1949 production and amounts usually sold were available. They represent 24 farms in Group 1, 17 farms in Group 2, and 72 farms in Group 3.

The average size of farms in the three groups showed that those under allotments (Groups 1 and 2) averaged considerably larger than the farms over allotments. There is a definite tendency for the larger farms to be making more use of the price support provisions of the agricultural program than smaller farms.

The average production figures for 1949 were: Group A, 476 bushels; Group B, 381 bushels; and Group C, 375 bushels. All three groups indicated that their 1949 production was approximately one-third greater than the amount of beans normally sold.

Changes in Bean Acreage

The farms that intentionally went along with the production control program, (Group 1) decreased acreage by 9 percent. Group 2, those farms under allotments accidentally, went even further reducing their acreage by 23 percent. The total reduction of these two groups, however, was more than offset by the 30 percent increase in total bean acreage by the 101 farms in Group 3. Many students of price control programs had feared this type of reaction on the part of farmers. It was thought that some would reduce acreage in order to receive a guaranteed price that might be higher than the expected open market price. The manner in which the government is forced to maintain the price of beans and other grains by law makes it possible for farmers to ignore allotments, increase acreage and sell this increased production on the open market which is indirectly supported by the government. This indirect support comes by way of the government's legal responsibility to buy the grain from those producers who went along with the program.

This, of course, is a strong argument for direct payments.

Use of Commercial Fertilizer

The farms complying with acreage allotments were expected to have used more fertilizer per acre in 1950 than in 1949 and also to have used more fertilizer per acre than farms over allotments. The farms over allotments were expected to have little change in fertilization.

Farms under allotments intentionally (Group 1) increased the rate of fertilization from 128 to 153 pounds per acre (Table XIII). This was a 25 pound or 19 percent increase. They fertilized a 6 percent smaller portion of their total bean acreage, however, and used fertilizers that averaged 6 percent weaker than those used in 1949. The actual increase in fertilization, as measured by units of plant food per acre fertilized, was 12 percent.

Farms under allotments accidentally (Group 2) increased by 13 percent the portion of total acres fertilized but used 15.5 percent less fertilizer per acre. This group led in pounds per acre both years but dropped from an average of 198 pounds in 1949 to 167 pounds in 1950. This 31 pound decrease and the use of 5 percent weaker fertilizer accounted for a 19 percent drop in active units per acre fertilized.

Farms over allotments (Group 3) did not react as expected. This groups had increased acreage 30 percent and little change was anticipated in fertilization. The rate of application averaged 143 pounds per acre in 1949 and 151 pounds in 1950. This 5 percent increase multiplied by a surprising 10.6 percent increase in strength of fertilizer used, gave Group 3 a large gain of 16 percent in units of plant food

TABLE XIII. BEAN ACREAGE AND COMMERCIAL FERTILIZATION IN 1949 AND 1950 AND CHANGES OCCURRING FROM 1949 to 1950 -- BY COMPLIANCE WITH ACREAGE ALLOTMENTS

	GROUP 1			GROUP 2			GROUP 3		
	1949	1950	Percent Change	1949	1950	Percent Change	1949	1950	Percent Change
Total number of farms	31	31		25	25		101	101	
Number of farms using fe fertilizer	23	24	+4.35	19	20	+5.26	78	76	-2.56
A. Acreage									
Total acres grown	746.50	676.70	-9.35	540.10	416.10	-22.96	1761.35	2292.60	+30.16
Average acres grown	24.08	21.83		21.60	16.64		17.44	22.70	
B. Rate of Fertilization									
Percent of crop fertilized	77.83	72.84	-6.41	66.49	74.89	+12.60	76.33	78.11	+2.33
Average pounds per acre fertilized	127.98	152.69	+19.31	198.23	167.43	-15.54	143.43	150.83	+5.16
Average units per acre fertilized	34.52	38.49	+11.79	51.69	41.69	-19.35	31.89	37.08	+16.27
Average units per cwt. of commercial fertilizer	26.97	25.27	- 6.30	26.07	24.90	-4.99	22.23	24.58	+10.57

per acre fertilized.

Change in Levels of Fertilization

The actual levels of fertilization used by the groups, measured in terms of units of plant food, show increases for Groups 1 and 3 and a decrease for Group 2 (Figure 15).

Change in Analysis of Fertilizers Used

The units of plant food per hundredweight of commercial fertilizer used varied considerably in allthree groups from 1949 to 1950 (Table XIII). It is difficult to know whether the changes in analysis of fertilizers used should be attributed to intentional planning on the part of farmers or to the fertilizer manufacturers and distributors who have recently been pushing the sale of fertilizers of higher analyses. Regardless of where the credit may lie, the crops benefit from increased units of plant food per hundredweight and the cost per unit of plant food is less when stronger fertilizers are used.[21]

Use of Barnyard Manure

Farms raising beans under acreage allotments intentionally (Group 1) used more barnyard manure than Groups 2 and 3 (Figure 16). This group also increased the percent of acres covered from 21 to 27. Groups 2 and 3 both showed slight decreases in 1950. Farms under allotments accidentally (Group 2) covered 16 percent of their bean acreage in 1949 and 14 percent in 1950. Group 3 covered about 20 percent in 1949 and 16 percent in 1950.

21. Michigan State College has been encouraging the manufacture and use of stronger fertilizers because of the greater economy to the farmer and saving of labor.

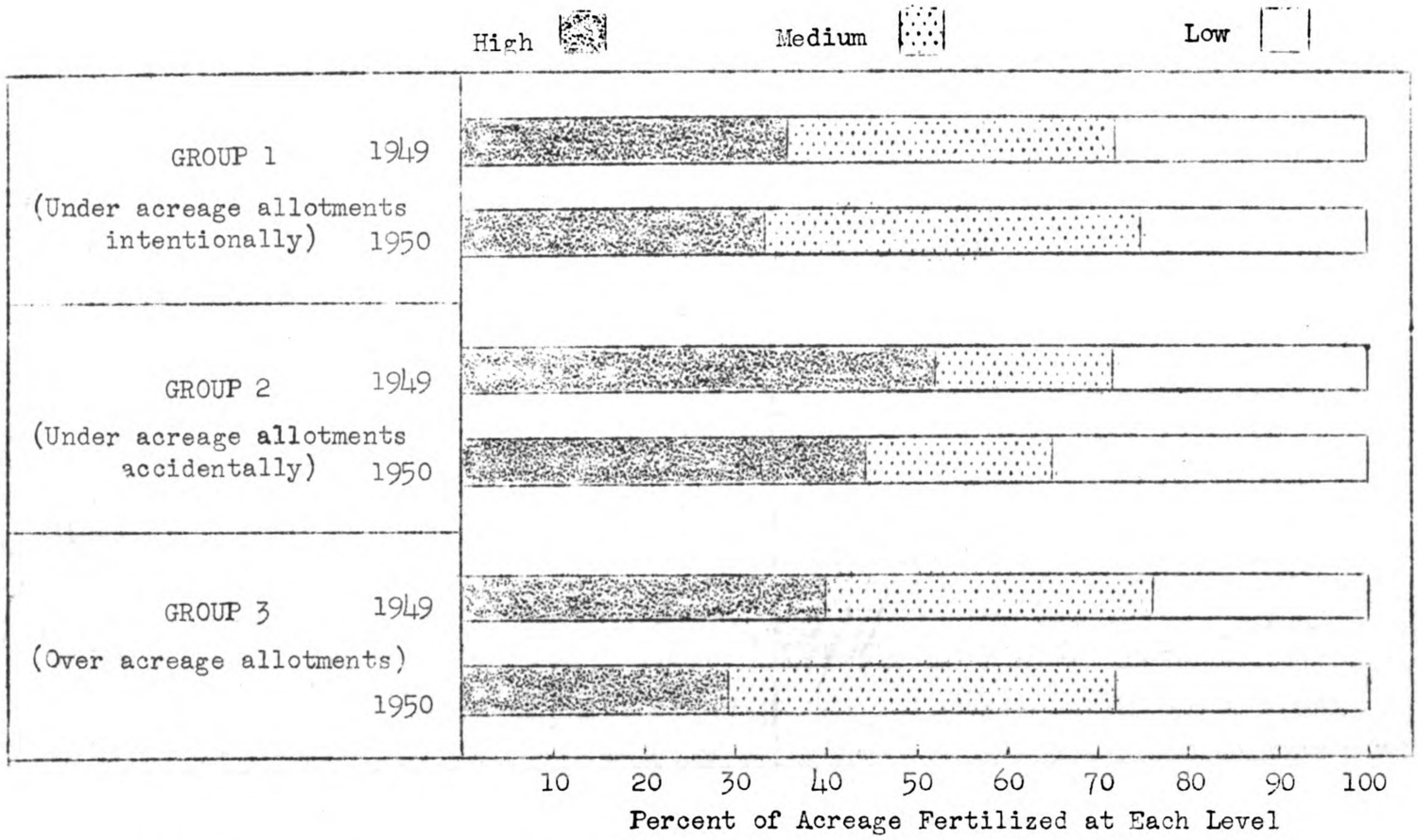


Figure 15. Percent of Acreage in Beans Fertilized at Various Levels* in 1949 and 1950, According to Compliance With Bean Acreage Allotments

*Low, 0 to 11 units of plant food per acre; medium, 12 to 35 units; and high, 36 units and over.

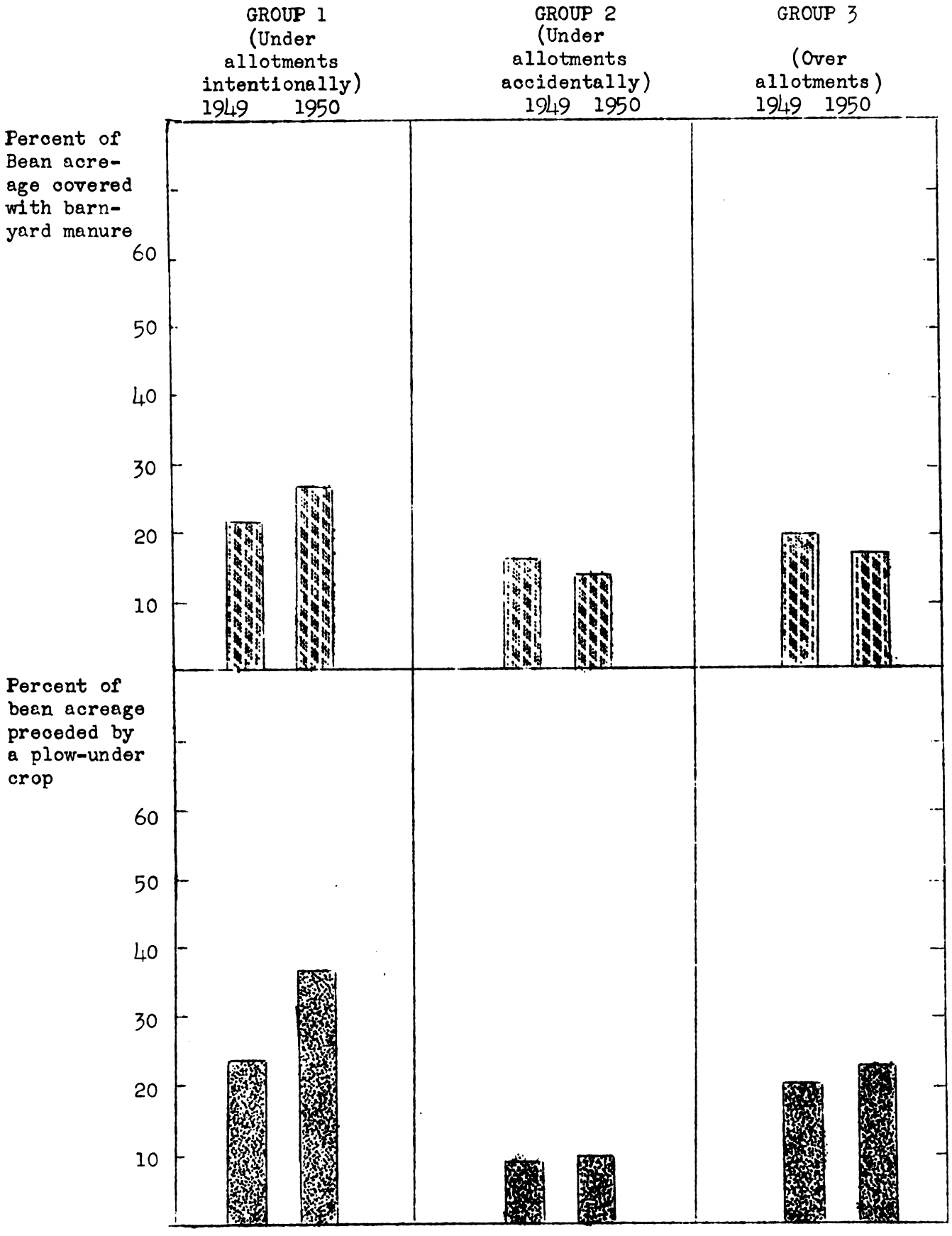


Figure 16 Use of barnyard manure and plow-under crops in bean fertilization in 1949 and 1950, by groups according to compliance with bean acreage allotments.

Use of Plow-Under Crops

There were definite variations in the use of plow-under crops by the three groups (Figure 16). Group 1 increased the percent of acreage preceded by a green manure crop from 24 to 35. Group 2 used this means of fertilization for 9 percent of its total acreage both years. Group 3, farms over allotments, decreased acreage preceded by green manure crops from 24 percent in 1949 to 20 percent in 1950. Thus Group 1 made substantially greater use of plow-under crops in 1950 than in 1949 and used more green manure than Groups 2 and 3 in 1950.

SUMMARY

Acreage allotments were placed on beans in 1950 after an all-time record crop in 1949. Farms had to be under their bean allotments to be eligible for price supports.

The first portion of the bean study, which attempted to show the effect of intended use of price supports on fertilization, resulted in the following conclusions. Farms planning to use price supports reduced acreage 6 percent and increased the rate of fertilization 6 percent. Farms changing from supports to no supports increased acreage 6 percent and raised fertilization 8 percent. The farms that used no support either year increased planted acreage 25 percent and decreased fertilization 5 percent.

The second portion of the study, which attempted to measure the effects of compliance with acreage allotments on fertilization, brought forth these results. Farms intentionally under allotments reduced

acreage 9 percent and increased the rate of fertilization 19 percent. They also made greater use of barnyard manure and plow-under crops. Farms accidentally under allotments decreased acreage 23 percent and decreased the rate of fertilization 15.5 percent. Farms over allotments increased acreage 30 percent, increased pounds per acre 5 percent, and used higher analysis fertilizer.

The results indicate that farms intentionally reducing acreage have attempted to substitute capital in the form of fertilizer for land. Thus a reduction in acreage by farms planning to use price supports probably did not result in an equal percentage decrease in production.

CHAPTER V

CHANGES IN CORN FERTILIZATION IN MICHIGAN

By Farms According to Compliance with Acreage Allotments in 1950

Corn was the most important crop grown on the farms in this study. In most cases it was used for feed on the farms where it was produced. Of the 578 farms visited, 519 grew corn in 1950. Only 48 of this number usually sold corn. Thus 90 percent of the farms grew corn but only about 10 percent of those raising corn usually had corn to sell.

The Production and Marketing Administration has seen fit to include most of the southern Michigan counties in the commercial corn growing area of the nation. All of the counties in this study except Sanilac had acreage allotments in 1950. However, farmers who fed their corn were not forced to reduce acreage nor was there any special incentive for them to do so.

This phase of the study is limited to the farms that usually sold corn. The reason for this is that it was believed that only these would have been affected by the price support program. This is not entirely true since stabilizing of the price of corn at a level above the normal market price in the long run might encourage Michigan farmers to grow a larger share of the corn they need for feed. However, this would not be reflected by changes in fertilization during one year of acreage allotments.

The changes in corn fertilization by farms according to intended

use of price supports were not measured. Only 7 farmers in this study were planning to use price supports in 1950 (Group A). Nine of the 48 operators who usually sold corn had used price supports in 1949. Four of these were not planning to use supports in 1950. Thus, 4 farms fell into Group B. The remaining 37 farmers did not use price supports either year (Group C). The first two groups were too small to give significance to changes in acreage or fertilization.

FARMS GROUPED BY COMPLIANCE WITH ACREAGE ALLOTMENTS

The farms were grouped to compare changes in fertilization made by those under acreage allotments in 1950 with those farms over corn acreage allotments. Nineteen farmers had complied and 29 had not. Only 3 farms were under corn allotments intentionally, according to the data collected in the study. These were included with the 16 that complied by coincidence.[22] It is believed that changes in acreage and fertilization shown can not be attributed to the price support program since 16 of the 19 farms under allotments claimed to have complied by accident.

General Information

Farms under allotments usually sold an average of 1,177 bushels of corn while the other group marketed an average of 1,006 bushels per year (Table XIV). Corn yields in Michigan were exceptionally

22. Separate groups had been made for farms under allotments intentionally and those under allotments accidentally in the potato, wheat, and bean studies.

TABLE XIV. GENERAL INFORMATION FOR THE FARMS RAISING CORN -- BY COMPLIANCE WITH ACREAGE ALLOTMENTS

	FARMS UNDER ACREAGE ALLOTMENTS	FARMS OVER ACREAGE ALLOTMENTS
Number of farms	19	29
Average size of farms	113.44	81.71
Average bushels of corn produced in 1949 *	1814.33	2045.20
Average bushels of corn usuallu sold *	1177.00	1005.60

* These are the averages of farms for which estimates of both the 1949 production and amounts usually sold were available. They represent 15 of the farms under acreage allotments, and 20 of the farms over acreage allotments.

high in 1949 and the farms in this study were well above their normal production. However, most of these farms fed part of their corn to livestock and the average bushels produced in 1949 cannot be compared directly with the average amounts of corn usually sold.

Changes in Corn Acreage

Farms under allotments decreased corn acreage 23 percent while farms over allotments increased acreage 10 percent (Table XV). Changes were expected since the first group included all those farms making important acreage decreases by definition. Farms making large increases had to fall into the group of farms over allotments unless their historical averages of corn acreage were considerably higher than their 1949 planted acreages. The total corn acreage for the 48 farms showed little change. A total of 1,432 acres were planted in 1949, and 1,394 acres in 1950. This was a 48 acre decrease, or about 3 percent less than the 1949 acreage.

Use of Commercial Fertilizer

The farms under allotments had fertilized only 36 percent of their corn acreage in 1949 (Table XV). In 1950, the same group fertilized 51 percent. No explanation was found for the large portion of the acreage not fertilized. On farms over allotments, 84 percent of the acreage received commercial fertilizer in 1949 and 88 percent in 1950. The farms over allotments also used more fertilizer per acre both years. The average rate varied only 3 one-hundredths of a pound, from 159.66 in 1949 to 159.69 in 1950. The other group put on 15 more pounds per acre

TABLE XV. CORN ACREAGE AND COMMERCIAL FERTILIZATION IN 1949 and 1950 AND CHANGES OCCURRING FROM 1949 to 1950 -- BY COMPLIANCE WITH ACREAGE ALLOTMENTS

	FARMS UNDER ACREAGE ALLOTMENTS			FARMS OVER ACREAGE ALLOTMENTS		
	1949	1950	Percent Change	1949	1950	Percent Change
Total number of farms	19	19		29	29	
Number of farms using fertilizer	11	12	+9.10	24	25	+4.17
A. Acreage						
Total acres grown	572.50	440.40	-23.07	859.00	943.30	+9.81
Average acres grown	30.13	23.18		29.26	32.53	
B. Rate of Fertilization						
Percent of crop fertilized	36.07	50.74	+40.67	84.63	87.60	+3.51
Average pounds per acre fertilized	119.59	134.27	+12.28	159.66	159.69	+0.02
Average units per acre fertilized	26.37	30.43	+15.40	39.19	41.07	+4.80
Average units per cwt. of commercial fertilizer	22.05	22.66	+2.77	24.55	25.72	+4.77

in 1950 but had used only 120 pounds per acre in 1949.

Change in Analysis of Fertilizers Used

Both groups used fertilizers of higher analysis in 1950. This accounted for part of the 15 percent increase in average units of plant food used per acre by farms under acreage allotments, and for all of the 5 percent increase on farms over allotments.

Change in Levels of Fertilization

The shifts in levels of fertilization support the data given above for increases in the amount of plant food used by both groups (Figure 17). A large portion of the acreage on farms under acreage allotments had received no fertilizer. Therefore three levels of fertilization used are: low, no fertilizer; medium, from 1 to 200 pounds of 2-12-6, or 1 to 140 pounds of 3-12-12, or equivalent amounts of other fertilizers; high, over 200 pounds of 2-12-6, or over 140 pounds of 3-12-12, or any amount of other fertilizers that contain 40 or more units of plant food.

Use of Barnyard Manure

A larger percentage of the corn acreage received manure than wheat or beans, but not as much as potatoes. There was little difference in the percent of acreage covered by the two groups in 1949. However, farms under allotments had reduced acreage 23 percent, and by applying about the same amount of manure, increased from 28 percent to 42 percent the portion of corn land covered with barnyard manure (Figure 18). Operators of farms over acreage allotments

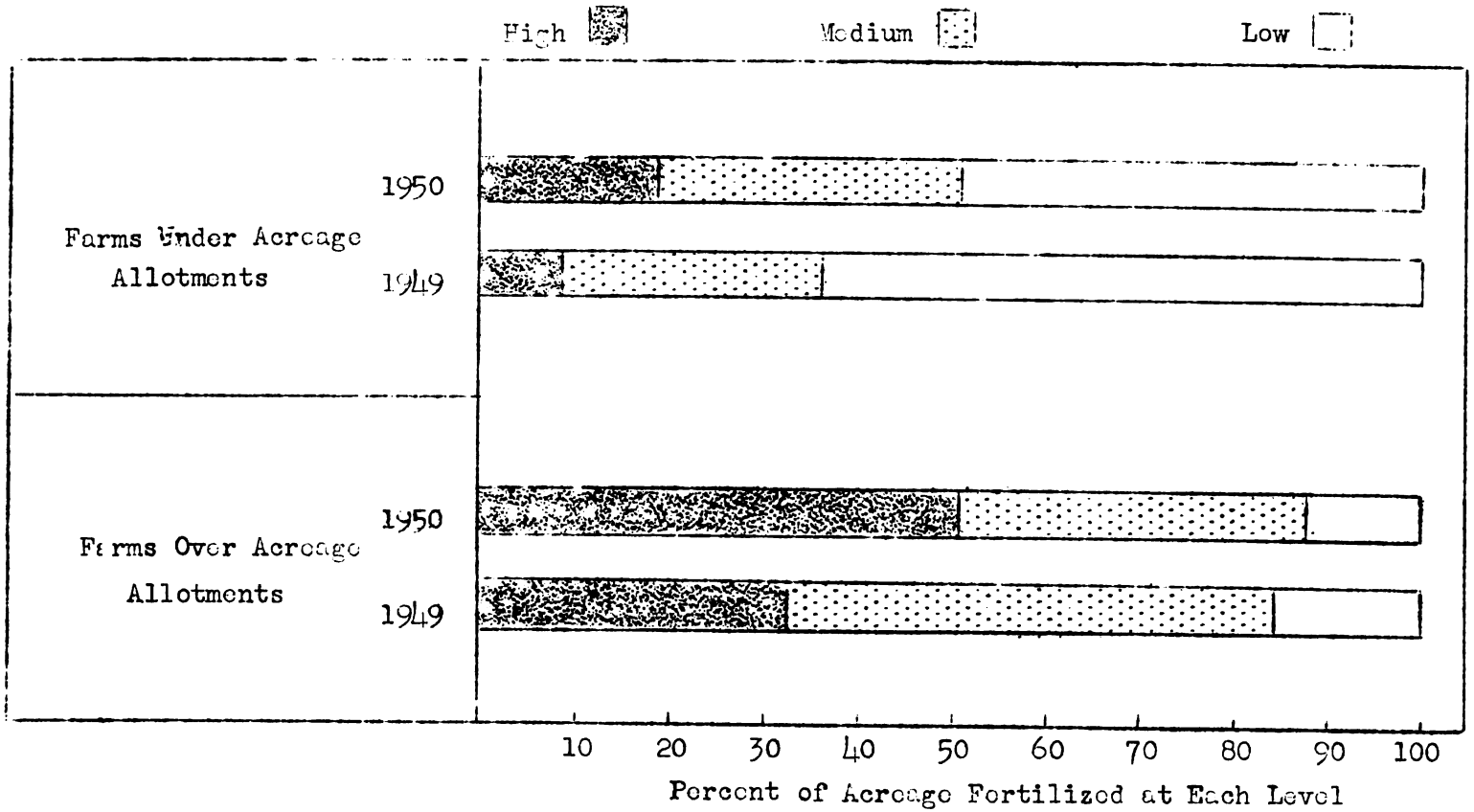


Figure 17. Percent of Acreage in Corn Fertilized at Various Levels* in 1949 and 1950, According to Compliance With Corn Acreage Allotments

*Low, no units of plant food per acre; medium, 1 to 39 units; and high, 40 units and over.

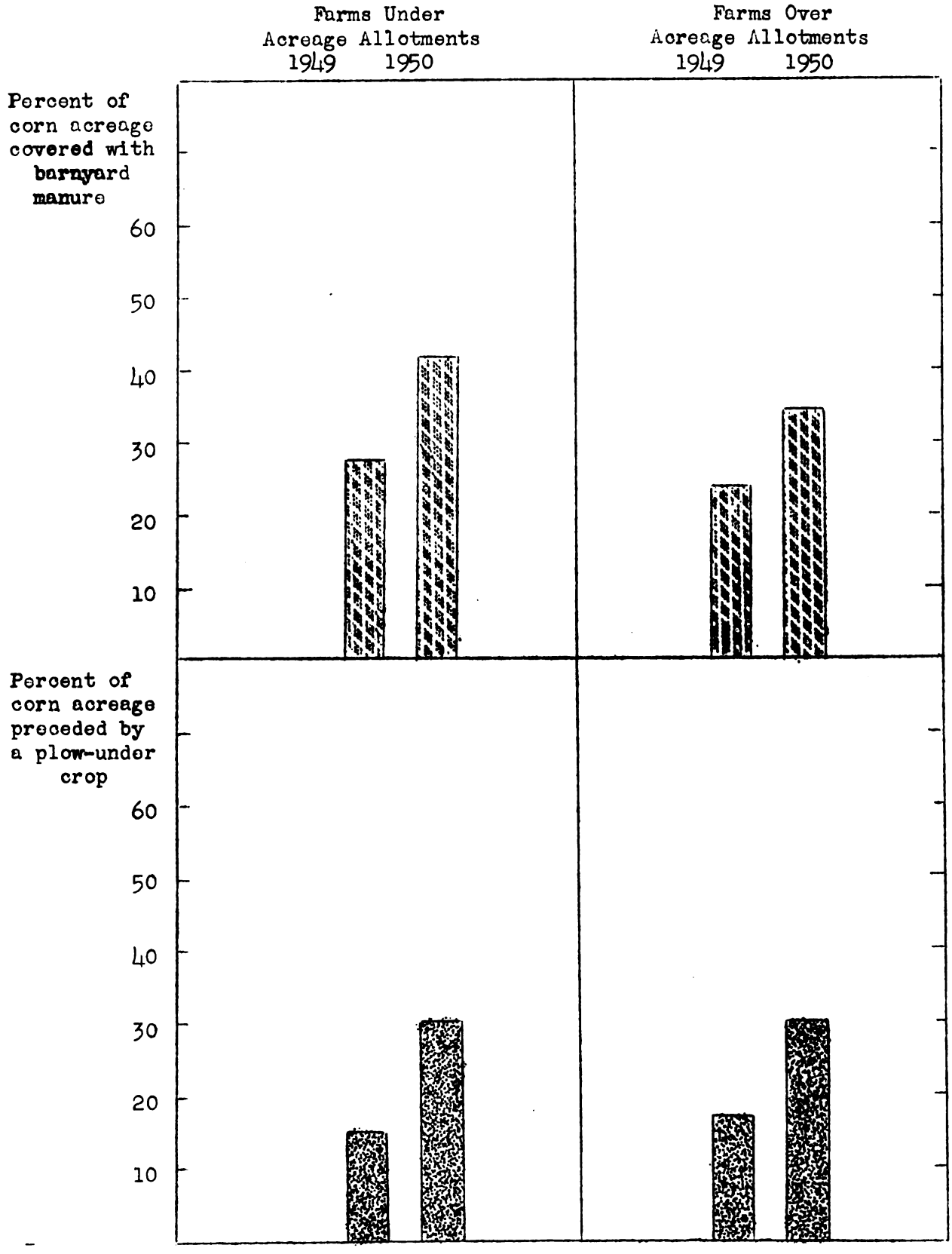


Figure 18. Use of barnyard manure and plow-under crops in corn fertilization in 1949 and 1950, according to compliance with corn acreage allotments.

covered 24 percent of their corn land in 1949 and 34 percent in 1950.

Use of Plow-Under Crops

There was little difference between the two groups in the percent of acres preceded by a plow-under crop. The figures for farms under acreage allotments show an increase from 15 percent in 1949 to 30 percent in 1950. An almost identical change on farms over allotments shows 18 percent of the 1949 corn land receiving a green manure crop as compared with 31 percent of the 1950 corn land.

SUMMARY

Corn was grown on 519 of the 578 farms in the study. Only 48 farms usually had corn to sell. Only 3 farmers were under acreage allotments intentionally. Therefore, it is believed that changes shown in acreage and fertilization of corn can not be attributed to the price support program.

Farms under allotments decreased corn acreage 23 percent while farms over allotments had increased acreage 10 percent. Farms under allotments also increased the average rate of fertilization in 1950 while those exceeding allotments made no change in pounds per acre. Both groups used fertilizers of higher analyses in 1950. It should be noted that farms over allotments used more fertilizer per acre and also used it on a much higher percentage of their corn land in both 1949 and 1950.

There was little difference in the use of barnyard manure and green manure crops by the two groups. Both made greater use of these two means of fertilization in 1950 than in 1949.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The government's attempts to control production are believed to bring about changes in production practices on farms. Acreage allotments were placed on potatoes, wheat, beans and corn in 1950. This was the first time allotments had been used since 1943. Compliance with acreage allotments was required to be eligible for price supports. The purpose of this study is to show the effects of the price support and production control programs on acreage and fertilization practices on potatoes, wheat, beans, and corn in Michigan in 1950.

The hypotheses for this study are: that farms using price supports and complying with acreage allotments are using more fertilizer than farms not using price supports and not complying with acreage allotments; and,that farms using price supports and complying with acreage allotments made greater increases in average amounts of fertilizer used per acre from 1949 to 1950 than farms that did not. Companion hypotheses for the study are: that farms using price supports and complying with acreage allotments reduced acreage of controlled crops; and, farms not using price supports and not complying with acreage allotments either maintained or increased the acreage of controlled crops.

The support prices for 1950 were relatively high and, at

planting time of the crops studied, seemed to be as high or higher than the expected open market price. Therefore there was a price incentive to farmers for staying under their acreage allotments. Some farmers reduced acreage intentionally in order to have the price insurance that price supports provide or to take advantage of a higher price. Since acreage was in effect rationed, it was expected that farmers would attempt to substitute capital in the form of fertilizer for land, the rationed factor of production.

The memory of the agricultural price collapse that followed World War I still lingered in the minds of farm leaders and they wouldn't let Congress forget what had happened. The flexible price supports of the Agricultural Act of 1948 had been replaced with the relatively high support levels of the Agricultural Act of 1949. With decreased demand for agricultural commodities following the end of World War II, prices naturally began to fall. Storage stocks increased and harmful surpluses were feared. The Secretary of Agriculture had set acreage allotments for 1950 as a barrier against surplus accumulation.

The original planning for the project of which this study is a part was done during the Spring of 1950. Agricultural prices had reached an all-time high in 1948. The whole economy was going into a slight recession which had some promise of becoming serious.

However, in June 1950, the Korean affair brought this country into limited warfare. Agricultural prices started upward. Not only did the trend in agricultural prices reverse itself but the likelihood was that prices farmers received would be as high or higher than the price support levels. This was the situation when the interviews were taken from July 15 to September 15, 1950.

The farmers' plans and decisions as to acreage and fertilization, in most cases, were already made and could not be changed. Therefore, the outbreak of fighting, with the resultant change in demand for agricultural commodities, did not invalidate this study. It did, however, force changes in methodology used in determining the effect of the price support program on fertilization.

In order to measure the effect of the price support program two groupings were used. The farms were first divided according to intended use of price supports:

Group A. Farms whose operators were planning to use price supports for the particular crop in 1950.

Group B. Farms whose operators had used price supports for the particular crop in 1949 but were not planning, at the time the survey was taken, to use them in 1950.

Group C. Farms whose operators had not used price supports for the particular crop in 1949 and were not planning to use them in 1950.

Changes made in acreage and fertilization were tabulated and averages were established for the groups. The second division which was used to further test the effect of the price support program on production practices was based on compliance with acreage allotments:

Group 1. Farms under acreage allotments intentionally.

Group 2. Farms under acreage allotments accidentally.

Group 3. Farms over acreage allotments.

It was expected that farms planning to use price supports, and those complying with acreage allotments intentionally, would have reduced acreage and increased fartilization (Groups A and 1). The farms not using price supports and those over allotments were expected to make little change in fertilization while maintaining or increasing acreage (Groups C and 3). The changes on farms that had used price supports in 1949 but were not planning to use them in 1950 (Group B) and farms under allotments accidentally (Group 2) were expected to lie between those mentioned above for the other groups. These assumptions were proven to be generally true.

In the preceding chapters the groups described above are used to measure the effect of the price support program and acreage allotments on acreage and fertilization practices on Michigan farms for potatoes, wheat, beans, and corn in 1950.

The results of these individual crop studies are brought together here in order to summarize and compare the changes found in acreage and fertilization.

TABLE XVI. CHANGES IN ACREAGE AND FERTILIZATION OF POTATOES, WHEAT, BEANS, AND CORN IN MICHIGAN BY GROUPS ACCORDING TO USE OF PRICE SUPPORTS IN 1950.

CROP	GROUP A Planning to use price supports			GROUP B Changing from supports to no sup.			GROUP C Not using supports either year		
	Percent Change			Percent Change			Percent Change		
	Acre.	lbs	units	Acre.	lbs	units	Acre.	lbs	units
Potatoes	0	+17	+19	+9	+12	+12	+2	+1	+1
Wheat	-16	+4	+12	-13	-5	0	0	-1	+3
Beans	-6	+6	+9	+5	+8	+17	+25	-5	-7
Corn	-	-	-	-	-	-	-	-	-

TABLE XVII. CHANGES IN ACREAGE AND FERTILIZATION OF POTATOES, WHEAT BEANS, AND CORN IN MICHIGAN BY GROUPS ACCORDING TO COMPLIANCE WITH ACREAGE ALLOTMENTS IN 1950

CROP	GROUP 1 Under Acreage allotments intentionally			GROUP 2 Under Acreage Allotments accidentally			GROUP 3 Over acreage allotments		
	Percent Change			Percent Change			Percent Change		
	Acre.	lbs	units	Acre.	lbs	units	Acre.	lbs.	units
Potatoes	-10	+10	+13	+9	+20	+20	+17	-7	-8
Wheat	-11	-5	+5	-21	+2	+11	+7	0	+5
Beans	-9	+19	+12	-23	-16	-19	+30	+5	+16
Corn	-	-	-	-23	+12	+15	+10	0	+5

Summaries for the individual crop studies are given at the end of each chapter.

Farms planning to use price supports in 1950 reduced acreage and increased fertilization with the important exception of those in the potato study. The potato farms that were to use price supports in 1950 had not reduced acreage. The manner in which potato allotments are handled in the counties permitted the potato producers in the study to get price supports without being forced to reduce acreage if they were really geared to produce potatoes.

Farms not using price supports either year varied practices with the crops. The potato farmers in this category made little change in either fertilization or acreage and the same was true for the wheat farmers. The bean growers increased acreage 25 percent and decreased units of plant food used per acre 7 percent.

The results support the hypothesis that farms using price supports made greater increases in average amounts of fertilizer used per acre from 1949 to 1950.

All of the groups of farms that were under acreage allotments intentionally, reduced acreage significantly and increased fertilization. The fertilization increases were highly significant for potatoes and beans.

Farms over acreage allotments had increased acreage 30 percent for beans, 17 percent for potatoes, 10 percent for corn, and 7 percent for wheat. Practically no change occurred in pounds of fertilizer

used per acre for the farms over acreage allotments that grew wheat and corn. However, the bean farms increased fertilization significantly while the potato farms decreased fertilization significantly.

The results of the corn and bean study strongly support the hypothesis that farms complying with acreage allotments made greater increases in average amounts of fertilizer used per acre from 1949 to 1950. In the case of the wheat study, although the results were not conclusive they followed the general trend.

The data compiled on the use of barnyard manure and plow-under crops show no consistent changes towards either an increase in the use of these two means of fertilization by farms under allotments, farms over allotments, farms planning to use price supports, or farms not planning to use price supports.

Higher analysis fertilizers were being used in 1950 than 1949 on the crops studied. This accounted for a portion of many of the gains in average units of plant food per acre.

The conclusion to be drawn from this study is that governmental attempts to control production of agricultural commodities by using acreage allotments will be offset, at least in part, by the use of improved production practices.

APPENDIX A

The Questionnaire and Worksheet

Michigan State College
Aug., 1950 (Rev. 2)

Agr. Econ. Dept.
and S. R. S.

FARM MANAGEMENT SURVEY

All information in this schedule is strictly confidential and under the control of the Agricultural Economics Department of Michigan State College. Names of persons interviewed in this survey will not be made public in any way.

County _____ Township _____

Tract number _____ Interviewer _____

Dates of Calls and Interview

Call Number	Call		Interview completed	
	Date	Time of day	Yes	No
1.				
2.				
3.				

We're making a special farm management survey in several counties in Michigan this summer. We're particularly interested in crops grown on Michigan farms, in the use and sale of crops, and in farmers' ideas about price supports for farm products.

We're talking with some of the farmers in _____ County this week. We pick out the farms to be visited by chance and talk with the operators.

First I need some information about the size of your farm.

1. How many acres do you farm altogether whether owned or rented? _____
   (If less than 70 acres, terminate the interview)
2. How many acres do you own? _____ (If the answers to question 1 and 2 are the same, omit question 3.)
3. How many acres do you rent? _____
   a. Is all of this rented from the same owner? _____
   b. What is the name of the owner and number of acres rented from each owner?
      (1) Name _____ Acres _____
      (2) Name _____ Acres _____
      (3) Name _____ Acres _____

      (See separate instructions for method of deciding whether or not to complete the interview.)

Tract No. _____

SECTION I

1. Now I would like to sketch a map of your farm to help us get a better picture of your cropping and soils programs.

(Assign a number to each field for reference in getting land use and soils data. Use farmer's numbering system if he has one. Indicate acreage and 1950 crop for each field and transfer to page 3.)

2. Land Use and Soil Treatment (Complete the table below for each field)

a. On this field No. ____ where you have corn, did you apply commercial fertilizer this year? How much per acre? What analysis? What did you raise on that field last year? Did you use commercial fertilizer? How much? What analysis? (Repeat for each field in corn, then proceed to other row crops, to wheat and small grains, and to hay and tillable pasture.)
Which of these fields did you put manure on this year? Which did you put it on last year? Did you have a plow-under crop on any of these fields this year? Last year?

b. On these fields in non-tillable pasture, did you apply any commercial fertilizer or manure? (Check to be sure that every field on the map is accounted for.)

Field No.	Acres	1950 Crop and Soil Treatment					1949 Crop and Soil Treatment				
		Crop	Comm. Fert. Lbs./acre	Comm. Fert. Anal.	Manure	Plow under	Crop	Comm. Fert. Lbs./acre	Comm. Fert. Anal.	Manure	Plow under
Till.											
Total		xxxx	xxx	xxx	xxx	xxx	xxxx	xxx	xxx	xxx	xxx
Other											
Total		xxxx	xxx	xxx	xxx	xxx	xxxx	xxx	xxx	xxx	xxx

c. How many tons of commercial fertilizer did you buy in 1950? ____
in 1949? ____

d. How many acres of wheat do you intend to plant this fall? ____

 Tract No._____

SECTION II

1. We are also interested in what Michigan farmers did with some of their crops last year, and to what extent they use government price supports.
   a. How many bushels of corn did you harvest in 1949?
      (1) (If any land was rented) what was the landlord's share?
   b. Did you sign a purchase agreement with P. & M. A. (A. A. A.) for any of your 1949 corn crop? For how many bushels?
      (1) Did you store it on your farm or in commercial storage?
      (2) How much did you deliver to the government?
      (3) (If all under purchase agreement was <u>not</u> delivered to the government) what did you do with the rest of it?
         (a) How much did you sell on the open market or to other farmers?
         (b) How much do you have on hand which you intend to sell or deliver to the government?
         (c) How much was or will be fed to livestock?
   c. Did you put any of your 1949 corn crop in approved storage and get a loan on it under the P. & M. A. program? How much did you store?
      (1) Did you store it on your farm or in commercial storage?
      (2) Is it still in storage?
      (3) Delivered to the government?
      (4) Loan repaid and crop sold?
   d. Did you sell any of your 1949 corn on the market or to other farmers which was not under purchase agreement or loan? How much did you sell?
   e. Do you have any on hand now which you are planning to sell? How much?
   f. Do you usually sell some corn in most years?
      (1) (If yes) About how many bushels per year would your sales average?
   g. How much corn did you feed to livestock?
   h. Could you tell me what the landlord did with his share?
      (1) Did he use a purchase agreement?
      (2) Loan and storage?
      (3) Did he sell it outright?
      (4) Was it fed on this place?

   (Repeat for wheat, oats, barley, rye, dry field beans, soybeans, and potatoes <u>if raised on this farm in 1949</u>.)

2. Now we would like to know something about what you intend to do with some of your 1950 crops.
   b. Do you intend to use a P. & M. A. purchase agreement for your 1950 (corn) crop?
      (1) Will you store it on your farm or in commercial storage?
   c. Do you plan to get a loan on any of your 1950 (corn) crop through P. & M.A.?
      (1) Will you store it on your farm or in commercial storage?
   d. Do you intend to sell any of your 1950 corn crop on the open market or to other farmers?
   g. Do you intend to feed any of your corn?

   (Repeat for wheat, oats, barley, rye, dry field beans, soybeans, and potatoes <u>if raised on this farm in 1950</u>.)

Tract No._____

REPLIES TO QUESTIONS 1 AND 2

Item	(1) 1949 Actual				(2) 1950 Intended			
a. Amount harvested					xxx	xxx	xxx	xxx
(1) Landl'ds share					xxx	xxx	xxx	xxx
Operator's share								
b. Purchase agreement								
(1) Where stored								
(2) Del. to gov't					xxx	xxx	xxx	xxx
(3) (a) Sold outright					xxx	xxx	xxx	xxx
(b) On hand					xxx	xxx	xxx	xxx
(c) Fed to livest'k					xxx	xxx	xxx	xxx
c. Loan and storage								
(1) Where stored								
(2) Still in storage					xxx	xxx	xxx	xxx
(3) Del. to gov't					xxx	xxx	xxx	xxx
(4) Repaid and sold					xxx	xxx	xxx	xxx
d. Outright sale								
e. To be sold					xxx	xxx	xxx	xxx
f. Usually sells					xxx	xxx	xxx	xxx
(1) Average					xxx	xxx	xxx	xxx
g. Fed to livestock								
Landlord's share								
h. (1) Purchase agreement					xxx	xxx	xxx	xxx
(2) Loan and storage					xxx	xxx	xxx	xxx
(3) Outright sale					xxx	xxx	xxx	xxx
(4) Fed to livestock					xxx	xxx	xxx	xxx

Tract No._____

3. Some farmers use the P. & M. A. purchase agreements or loan and storage programs and others don't. We'd like to know some of the reasons for this. (Ask the following questions for <u>each</u> of the crops listed on page 5.)
(1) I notice that you put (didn't put) your 1949 corn crop under a purchase agreement (and/or under loan and storage). Why did you decide to handle your crop that way?
(2) What other reasons?

Crop	Did	Did not	Reasons

4. (For all crops listed in question 1 and 2 for both 1949 and 1950, check to determine whether disposal intentions for 1950 are different than actual disposal in 1949 in the use of purchase agreement, loan and storage, outright sale, no sales at all, or in any combination of these. For each difference noted, ask the questions below.)
a. In handling your corn crop, I see that last year you (<u>specify '49 practices</u>) and that this year you intend to (<u>specify '50 practices</u>). I would be interested in knowing why you are making this change.
Crop: _____ Change: _____
Reason: _____
_____
Crop: _____ Change: _____
Reason: _____
_____

5. In general, which price support plan would you prefer, the purchase agreement or the loan and storage program?
(1) Purchase agreement (___) (3) Neither (___)
(2) Loan and storage (___) (4) Don't know (___)
Why? _____
_____
_____

Tract No. _____

6. The County P. & M. A. Office has set up acreage allotments in 1950 for most farms that grow certain crops. What acreage allotment did you receive for corn? For wheat? For beans? For potatoes? (Record reply under question 7)

7. (Check p. 3 to see if within allotment on each controlled crop grown and ask:) Would you mind telling me why you stayed (did not stay) within your allotment on corn?

Crop	Allot. Acres	Actual Acres	Reasons why or why not

Section III

1. Where do you get most of your information about the price support program and how it operates?

	Free response	Follow up
(1) Township committeemen	(____)	(____)
(2) County P. & M. A. employees	(____)	(____)
(3) Other farmers	(____)	(____)
(4) County agricultural agent	(____)	(____)
(5) Radio	(____)	(____)
(6) Newspapers	(____)	(____)
(7) Farm magazines	(____)	(____)
(8) Other (specify) _____		

(For each source not mentioned as a free response ask:) Do you get any information from _____? (Record response in follow-up column)

2. What do you understand to be the reason why there is a price support program for some farm crops? _____

3. How do you personally feel about it? Do you think that a price support program is needed, or not? Yes ( ) No ( ) DK ( )
Why do you feel that way? _____

4. What do you understand to be the relation, if any, between support price and parity? _____

5. What do you understand to be the reason for acreage allotments on such crops as corn and wheat? _____

6. How do you feel about it personally? Do you think that acreage allotments are necessary, or not? Yes ( ) No ( ) DK ( )
Why do you feel that way? _____

7. We've been talking about the price support and acreage allotment program as it operates over the whole country. Now let's come back to your local situation. How do you feel about the way the program is operating in this county?

8. We sometimes hear people talking about using marketing quotas in connection with price support programs. Would you mind telling me just what the term "marketing quota" means to you? _____

9. (Omit 9 if answer to 8 is "don't know")
How do you feel about it personally? Do you feel that marketing quotas should ever be set up, or not? Yes ( ) No ( ) DK ( )
Why do you feel that way? _____

10. Have you heard of the "Brannan Plan"? Yes ( ) No ( )
(If yes) How do you feel about it? _____

 Tract No. _____

SECTION IV

Now I'd like to get your comments on some situations dealing with farmers and the price support program.

1. Mr. Brown usually grows about 20 acres of wheat. He was notified that his 1950 wheat allotment would be 16 acres. He stayed within this allotment because he thought he might want to use the purchase agreement or loan-and-storage program. Mr. Brown tried to get as high a yield as he could on the 16 acres of wheat that he was allotted. He got the best seed he could find, fertilized heavily, and sowed his wheat on the best 16 acres on the farm. A friend commented that it seemed to him such practices would result in a bigger cut in wheat acreage this fall if most farmers did the same thing as Brown.

   Do you think Brown was justified in his actions even though it would mean bigger cuts in acreage allotments this fall? _____

2. Mr. Stone ordinarily raises about enough corn to feed his livestock. Last fall he found that he could get a government loan of $1.40 a bushel on his corn. Since Mr. Stone had plenty of good storage space, he saw a chance to make some extra money by taking advantage of the loan and storage program. He put his <u>entire</u> crop in storage with a loan of $1.40 a bushel on it and bought corn for livestock feed at 90 cents a bushel from neighbors who did not have approved storage. He was thus able to make 50 cents a bushel on his own corn which he would otherwise have fed to his livestock.

   What do you think of Mr. Stone's actions? _____

3. A group of farmers were discussing price support programs at a meeting on agricultural policy. Mr. Smith was speaking: "I am in favor of the general idea of a price support program for farmers which would keep their incomes from falling too far. I think, however, that the present program is unfair to us farmers here in Michigan. We don't grow very many acres of these so-called basic crops. It's the big fellows further West who ought to have their acreage allotments cut, not us. They're the ones who really cause the surplus."

   What do you think of Mr. Smith's statement? _____

4. Mr. Black had been doing a lot of thinking about the whole price support problem and its relation to farmers' income. One day he was talking with a neighbor about it and said, "There's a lot of talk about security these days and it's high time farmers had a little of it. They ought to be entitled to have a floor under their prices so their incomes wouldn't fall too far and plunge the whole country into a depression. The way I see it a farmer ought to be guaranteed 90% of parity on everything he sells so his buying power will never fall too far behind that of the city man. I'd go for that idea even if it meant acreage allotments, production controls on livestock, marketing quotas or any other kind of regulations to make it work."

a. What do you think of Mr. Black's statement that there should be a floor under farm prices? _____

b. What do you think of Mr. Black's idea that a farmer should receive 90% of parity? _____

c. How far would you go in agreeing with Mr. Black that farmers ought to have more security even if it means more acreage allotments, production controls and marketing quotas? _____

5. Two farmers were talking about ways to keep farm prices and incomes from falling too low. Both men agreed that the present plan of price supports for such crops as corn and wheat worked fairly well, that is, having farmers arrange purchase agreements or loans-and-storage with P. & M. A. -- They didn't agree, however, on how perishables like butter and eggs should be supported. One of the farmers, Mr. Benson, said he favored the present method in which the government buys direct from processors and stores the products in order to hold prices up. Mr. Wood, on the other hand, said that he favored a plan under which farmers would sell all their perishable products like eggs for whatever they would bring. If these prices were so low that farm incomes would be below parity, then the government would make direct payments to farmers in order to bring their incomes up.

(1) As you see it, what are the advantages of Mr. Benson's suggestion that our government continue its present plan of buying direct from processors and storing perishables? _____

What are the disadvantages? _____

(2) Have you ever heard of Wood's idea that our government would allow perishable products to sell for whatever they would bring and then pay farmers direct, if necessary, to bring their incomes up?

1) Yes (____) 3) No (____)
2) Yes, Brannan plan (____) 4) Don't know (____)

(a) What do you feel are the advantages of such a plan? _____

_____

_____

(b) Disadvantages? _____

_____

_____

(c) In general, which of the two ideas for handling perishable products do you prefer?

1) Purchase from processors (____)
2) Direct payments to farmers (____)
3) Don't know (____)

SECTION V

We have just a few more questions to ask you. They have to do with general information about the farm and about you so that we can divide the responses people give according to the ages of farms and so on.

1. First, would you mind telling me how old you are?

(1) Less than 30 (____) (4) 50 - 59 (____)
(2) 30 - 39 (____) (5) 60 and over (____)
(3) 40 - 49 (____)

2. How many years have you been farming on your own?

(1) Less than 5 (____) (5) 20 - 29 (____)
(2) 5 - 9 (____) (6) 30 - 39 (____)
(3) 10 - 14 (____) (7) 40 and over (____)
(4) 15 - 19 (____)

3. What was the last grade or year you completed in school?

(1) No schooling (____) (5) Some high school (____)
(2) 1 - 4 years grammar (____) (6) Completed high school (____)
(3) 5 - 7 years grammar (____) (7) Some college (____)
(4) Completed grammar (____) (8) Completed college (____)

4. Have you ever taken a short course in agriculture? (1) Yes, college (____)
(2) Yes, Vet. Adm. (____)
(3) No (____)

5. Are you a member of the Michigan Farm Bureau? (1) Yes (____)
(2) No (____)

6. The Grange? (1) Yes (____)
(2) No (____)

7. Do you remember for certain whether or not you voted in the 1948 Presidential Election?
   (1) Yes, voted (___) (3) No, too young to vote (___)
   (2) No, didn't vote (___) (4) Uncertain (___)

8. In general, which political party did you favor in the Presidential Election of 1948?
   (1) Republican (___) (3) Other (specify) (___)
   (2) Democratic (___) (4) Uncertain (___)

9. Now to complete the picture of your farm organization, we need to know how many livestock you have. How many dairy cows did you have on hand January 1, 1950?
   (1) Dairy cows? ____ (6) Sows? ____
   (2) Beef cows? ____ (7) Pigs? ____
   (3) Feeder cattle? ____ (8) Hens? ____
   (4) Ewes? ____ (9) Other (specify) ____
   (5) Feeder lambs? ____

10. Have you bought any corn for livestock feed since last October 1? How many bushels? Other grain? (Specify)

Corn	

11. Do you feel that you have adequate storage for your corn? Did you build any new storage for corn in the past two years, either permanent or temporary? Do you plan to build any additional storage for corn in 1950, either permanent or temporary?

    (Repeat for wheat, other small grain, beans, and potatoes if grown on this farm in 1950.)

	Adequate			Built past 2 yrs.			Plans to build			
	Yes	No	Maybe	Perm.	Temp.	No	Perm.	Temp.	Maybe	No
Corn										
Wheat										
Other sm.gr.										
Beans										
Potatoes										

12. (If owner or part-owner) Would you mind telling me if you own your farm free and clear or if you still have some indebtedness?
    Free (___)
    Debt (___)

- -

13. Finally, so that we may check our records and also send you a copy of our report would you mind giving us your name and address?

_____

_____

_____

Worksheet 2
P&MA Study
July 1951
M.S.C., Ag. Econ. Dept.
C.W.S. Copied by _____

Farm No._____
Size of farm_____
Acres owned_____
Acres rented_____

	Corn		Wheat		Beans		Potatoes	
	1950	1949	1950	1949	1950	1949	1950	1949
(From Page 3)								
1. Raised on Farm								
2. Total Fields								
3. Total Acres								
4. Commercial Fertilizer								
a. Acres								
b. Percent of crop								
c. Pounds per acre								
d. Analysis								
e. Active units per cwt.								
f. Active units per acre								
5. Barn Yard Manure								
a. Acres covered								
b. Percent of crop								
6. Plow Under								
a. Acres								
b. Percent of crop								
(From Page 5)								
7. Total Production								
8. Pur. Agrmt. or Loan & S.								
9. Usually Sells								
10. Average Amount Sold								

	1	2	3	4	5	6	7	8
11. Question 3 (page 6)								
12. Question 7 (page 7)								

13. Remarks: _____

_____

APPENDIX B

Tonnage of Different Grades of Fertilizer Sold in Michigan in 1950

TONNAGE OF DIFFERENT GRADES OF FERTILIZER SOLD IN MICHIGAN IN 1950

Compiled by Soil Science Department of Michigan State College
From Reports Submitted by Fertilizer Companies

GRADE	TONS			% of TOTAL	GRADE	TONS			% of TOTAL
	Spring	Fall	Total			Spring	Fall	Total	
0-18-0	10,164	3,116	13,280	2.674	5-10-10	48	67	115	0.023
0-20-0	14,150	3,716	17,866	3.597	5-20-20	-	63	63	0.013
0-35-0	273	-	273	0.055	6-8-6	4	-	4	0.001
0-36-0	-	46	46	0.009	6-10-4	339	87	426	0.086
0-45-0	52	65	117	0.024	8-6-4	8	-	8	0.002
0-48-0	166	-	166	0.033	8-8-8	1,373	846	2,219	0.447
0-9-27	1,932	841	2,773	0.558	10-6-4	3,018	788	3,806	0.766
0-10-20	1,104	-	1,104	0.222	10-8-6	40	-	40	0.008
0-10-30	1,778	348	2,126	0.428	10-10-10	2,021	180	2,201	0.443
0-12-12	9,496	2,011	11,507	2.317	15-40-15	7	2	9	0.008
0-14-7	1,689	480	2,169	0.437	KCl 50%	44	39	83	0.017
0-14-14	111	-	111	0.022	KCl 60%	259	211	470	0.095
0-16-16	2,577	-	2,577	0.519	$NaNO_3$	615	283	898	0.181
0-20-10	2,872	1,066	3,938	0.793	NH_4NO_3	4,118	1,882	6,000	1.208
0-20-20	5,695	9,961	15,656	3.152	$Ca(NO_3)_2$	45	-	45	0.009
2-12-6	77,534	39,957	117,491	23.653	$(NH_4)_2SO_4$	1,597	418	2,015	0.406
2-14-8	1,248	1,173	2,421	0.487	Cyanamid	137	25	162	0.033
2-16-8	20,942	11,774	32,716	6.586	Copper sulphate	61	1	62	0.012
3-9-18	6,710	1,479	8,189	1.649	Manganese sulphate	234	-	234	0.047
3-9-27	62	400	462	0.093	Zinc sulphate	1	-	1	0.000
3-12-12	87,704	56,997	144,701	29.131	Borax	62	4	66	0.013
3-15-15	366	242	608	0.122	Sulphur	52	-	52	0.010
3-18-9	21,875	14,590	36,465	7.341	Dried manures	1,176	102	1,278	0.257
3-24-12	2,998	2,280	5,278	1.063	Bone meal, steamed	156	87	243	0.049
4-10-6	14	-	14	0.003	Bone tankage	20	-	20	0.004
4-10-10	615	-	615	0.124	Rock phosphate	1,693	1,382	3,075	0.619
4-12-4	80	6	86	0.017	NuGreen	188	30	218	0.044
4-12-8	14,741	2,275	17,016	3.426	Esminel	1	-	1	0.000
4-16-4	567	30	597	0.120	A-N-L	25	-	25	0.005
4-16-8	2,859	2	2,861	0.576	Tobacco stems	1	-	1	0.000
4-16-16	6,729	6,035	12,764	2.569	Miscellaneous	7,625	3,530	11,155	2.246
4-24-12	3,060	1,795	4,855	0.977	Total	325,881	170,845	496,726	100.007
5-10-5	750	133	883	0.178	Percentage	65.606	34.394	100.000	

To the total (496,726) should be added 3,840 tons of 0-18-0, 3,140 tons of 0-19-0, and 7,120 tons of 0-20-0 distributed by the Federal Production and Marketing Administration. These items do not enter into the summary anywhere else. That makes a grand total of 510,826 tons distributed in Michigan.

(6565)

Total tonnage of mixed goods	438,874
Tonnage of superphosphates	31,748
Percentage of total tonnage composed of grades or ratios recommended by Soil Science Department	95.724%
Percentage of mixed goods containing 20% or more plant food	99.998%

Percentage for 1943- 99.52, 1944- 99.98, 1945- 100.00, 1946- 100.00, 1947- 100.00, 1948- 100.00, 1949- 100.00

Total number of grades containing two or more plant food elements	37
Number of grades sold in 1949 and not sold in 1950 (grades dropped)	1
Number of grades not sold in 1949 but sold in 1950 (grades added)	9

Increase over last year's total sales - 69,128 tons or 16.16%
Percentage of total sales made up of 10 grades - 84.446%

Order of 10 Best Sellers

1. 3-12-12	3. 3-18-9	5. 0-20-0	7. 0-20-20	9. 4-16-16
2. 2-12-6	4. 2-16-8	6. 4-12-8	8. 0-18-0	10. 0-12-12

Grade dropped from list of "Ten Best Sellers" was 3-9-18.
Grade added to list was 4-16-16.

Grades Added to List of Total Sales			Grades Dropped
0-16-16	4-10-10	8-6-4	2-12-12
3-9-27	5-20-20	10-8-6	
4-10-6	6-8-6	15-40-15	

Grades and Ratios on the "Recommended" List

0-12-12	0-14-7	2-12-6	4-16-4	Superphosphates and carriers
0-14-14	0-20-10	3-9-18	4-16-8	of nitrogen and potash. Also
0-20-20	0-9-27	3-12-12	6-12-6	8-8-8 for experimental
0-10-20	2-16-8	4-12-8	10-6-4	purposes as well as special garden and turf fertilizers.

There were 15 tons of borax and 107 tons of manganese sulphate reported as having been sold in mixed fertilizers. These are included in the summary along with those reported as materials.

The miscellaneous tonnage consisted largely of small quantities of such material as sludges, liquids, pills, and unusual grades which could not be listed without revealing their identity or the identity of the reporters.

The increase in total tons this year was partly due to the fact that sales reports were requested from several companies that had not heretofore reported. Only 52% of these companies responded and their sales amounted to only 3.93% of the total sales.

(6324)

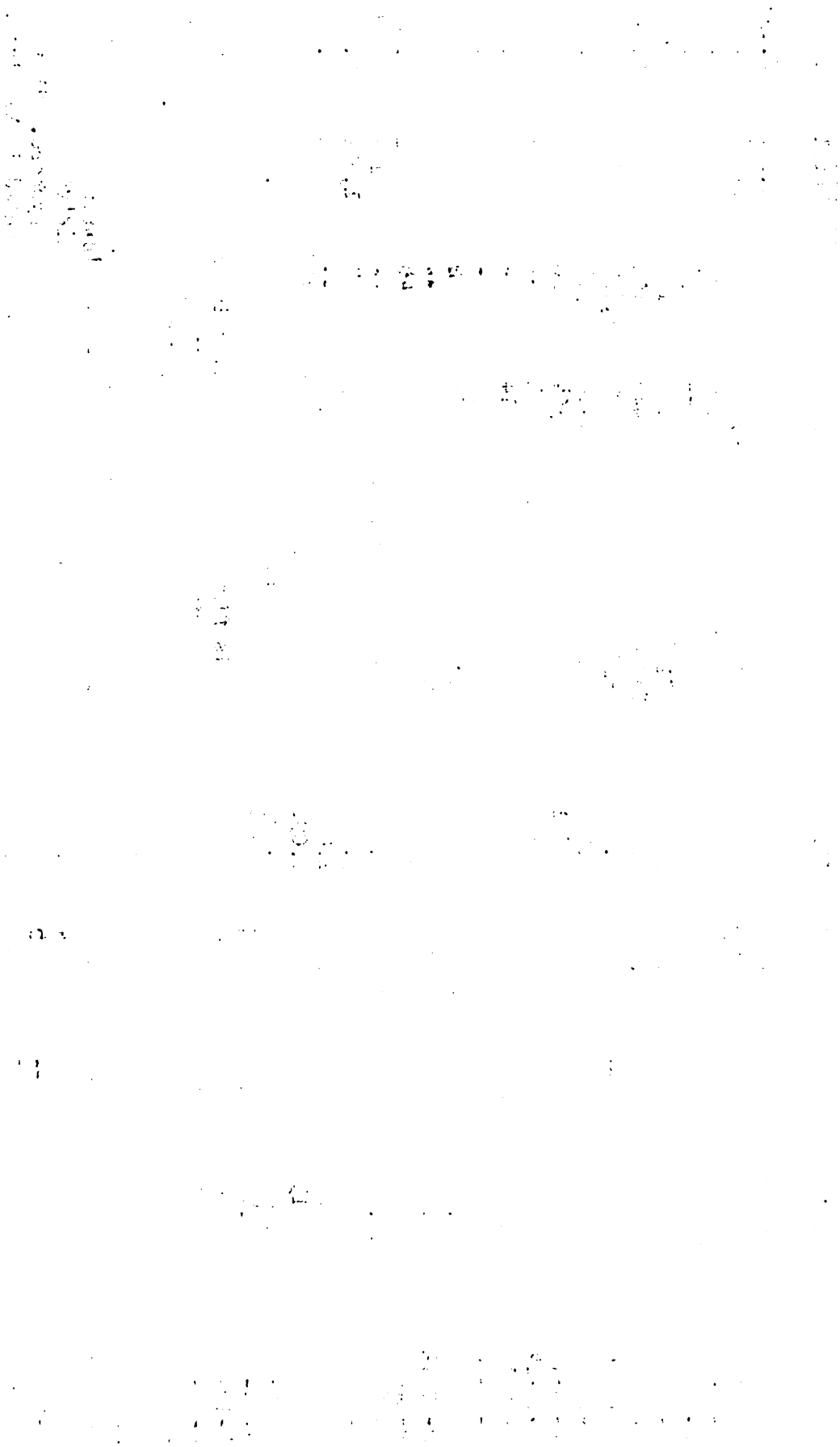
TONNAGE OF DIFFERENT GRADES OF FERTILIZER SOLD IN MICHIGAN IN 1949

Compiled by Soil Science Department of Michigan State College
From Reports Submitted by Fertilizer Companies

GRADE	TONS			% of TOTAL
	Spring	Fall	Total	
0-18-0	10,214	3,215	13,429	3.141
0-20-0	11,775	3,671	15,446	3.612
0-30-0	78	100	178	0.042
0-45-0	615	57	672	0.157
0-9-27	4,591	329	4,920	1.151
0-10-20	1,310	53	1,363	0.319
0-10-30	195	--	195	0.046
0-12-12	9,608	2,621	12,229	2.860
0-14-7	1,789	482	2,271	0.531
0-14-14	1,111	461	1,572	0.368
0-20-10	2,426	1,519	3,945	0.923
0-20-20	7,067	5,281	12,348	2.888
2-12-6	94,374	52,163	146,537	34.270
2-12-12	4,631	1,141	5,772	1.350
2-14-8	906	1,037	1,943	0.454
2-16-8	17,390	13,470	30,860	7.217
3-9-18	12,806	1,078	13,884	3.247
3-12-12	63,084	28,489	91,573	21.416
3-15-15	155	229	384	0.090
3-18-9	11,020	9,090	20,110	4.703
3-24-12	3,455	2,052	5,507	1.288
4-12-4	291	--	291	0.068
4-12-8	11,013	2,005	13,018	3.044
4-16-4	541	--	541	0.127
4-16-8	2,506	563	3,069	0.718
4-16-16	4,427	2,401	6,828	1.597
4-24-12	162	303	465	0.109
5-10-5	84	--	84	0.020
5-10-10	5	--	5	0.001
6-10-4	502	120	622	0.145
8-8-8	1,245	32	1,277	0.299
10-6-4	2,606	635	3,241	0.758
10-10-10	754	--	754	0.176
KCl 50%	--	50	50	0.012
KCl 60%	154	104	258	0.060
$NaNO_3$	945	100	1,045	0.244
NH_4NO_3	3,097	1,615	4,712	1.102
$(NH_4)_2SO_4$	2,464	309	2,773	0.649
Cyanamid	304	10	314	0.073
Aluminum sulphate	1	--	1	0.000
Copper sulphate	14	--	14	0.003
Manganese sulphate	95	--	95	0.022
Borax	71	2	73	0.017
Sulphur	5	--	5	0.001
Dried manures	846	46	892	0.209
Bone meal, steamed	113	--	113	0.026
Rock phosphate	965	627	1,592	0.372
Uramon	328	--	328	0.077
Total	292,138*	135,460	427,598	100.002
Percentage	68.321	31.679	100.000	

*This figure for spring sales is slightly larger than that given in the summary of spring sales because one company reported its spring sales in the fall.

To the total (427,598) should be added 2,500 tons of 0-18-0 and 13,154 tons of 0-20-0 distributed by the Federal Production & Marketing Administration. These items do not enter into the summary anywhere. That makes a grand total of 443,252 tons distributed in Michigan.



Total tonnage of mixed goods 385,608

Tonnage of superphosphates 29,725

Percentage of total tonnage composed of grades or ratios recommended by Soil Science Department 95.221%

Percentage of mixed goods containing 20% or more plant food 100.00

Percentage for 1943 - 99.52 1946 - 100
1944 - 99.98 1947 - 100
1945 - 100 1948 - 100

Total number of grades containing two or more plant food elements - 29

Number of grades sold in 1948 and not sold in 1949 (grades dropped) 2

Number of grades not sold in 1948 but sold in 1949 (grades added) 4

Increase over last year's total sales (tons) 27,851 or 6.98%

Percentage of total sales made up of 10 grades 86.397

Order of 10 Best Sellers

1. 2-12-6	2. 2-16-8	5. 0-20-0	7. 0-18-0	9. 0-20-20
2. 3-12-12	4. 3-18-9	6. 3-9-18	8. 4-12-8	10. 0-12-12

Grade dropped from list of "10 best sellers" was 0-9-27.
Grade added to list was 3-18-9.

Grades Added to List of Total Sales				Grades Dropped	
0-14-14	3-24-12	4-16-16	5-10-10	3-12-8	8-16-8

Grades and Ratios on the "Recommended" List

0-12-12	0-14-7	2-12-6	4-16-4	Superphosphates and carriers of nitrogen and potash. Also 8-8-8 for experimental purposes only, as well as special garden and turf fertilizers.
0-14-14	0-20-10	3-9-18	4-16-8	
0-20-20	0-9-27	3-12-12	6-12-6	
0-10-20	2-16-8	4-12-8	10-6-4	

13 tons of manganese sulphate and 39 tons of borax were reported as having been sold in mixed fertilizers. These are included in the summary along with those reported as materials.

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