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ALABAMA
Agricultural Experiment Station

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Alabama Polytechnic Institute

AUBURN

FATTENING HOGS IN ALABAMA

- I.—Peanut pastures compared with dry feeds.
 - II.—Fattening hogs during the winter months on rape, rye, and oat pastures as against dry feeds.
 - III.—Fattening hogs during the summer and fall months on cowpea, soy bean, and velvet bean pastures as against dry feeds.
 - IV.—Fattening hogs in dry lots on corn, shorts, and skim milk.
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BY

DAN T. GRAY, L. W. SUMMERS, L. W. SHOOK

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PART I

Peanut Pasture Compared with Certain Concentrated Feeds for Fattening Hogs

BY

DAN T. GRAY, L. W. SUMMERS AND
L. W. SHOOK.

INTRODUCTION.

Other things being equal, legumes should always be made use of when planning a succession of summer crops for hogs, on account of their favorable influence in building up soils. For winter grazing crops, however, many non-legumes, as rape, rye, and oats, can be used to great advantage and profit. Peanuts probably rank first among the many valuable summer leguminous hog crops. Many farmers of the South are already aware of their high feeding value, and they are being used in practically all of the few sections of the South which produce more pork than is used at home. The good farmers of the southern portions of Georgia and Alabama have been using peanut pastures as hog feeds for several years. As the peanut is adapted to widely different soils and conditions, other sections of the State should take advantage of this valuable and cheap feed. As a rule, when a hog-producing section is found in the South, a peanut-growing section is also found.

RATIONS AND PEANUT CROPS.

As one of the main objects of the tests was to compare peanut pastures with certain high-priced concentrated feeds for fattening hogs, the hogs were divided into lots and fed various feeds. The following rations were used:

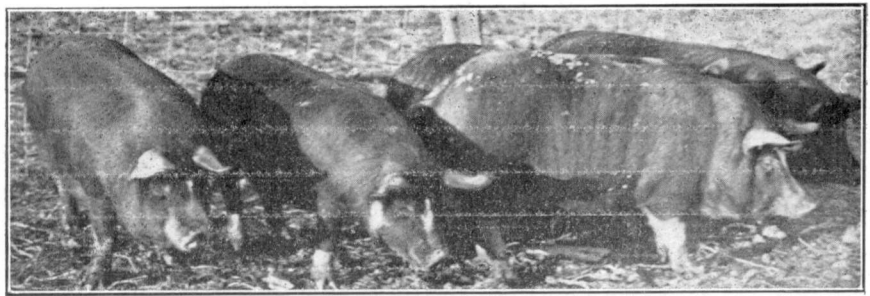
1911-12:—

- Lot 1—Peanut pasture
Corn— $\frac{1}{2}$ ration.
- Lot 2—Peanut pasture,
Corn $\frac{4}{5}$,
Tankage $\frac{1}{5}$, } $\frac{1}{2}$ ration.
- Lot 3—Peanut Pasture alone.
- Lot 4—Soy bean hay,
Corn— $\frac{1}{2}$ ration.
- Lot 5—Corn $\frac{4}{5}$,
Tankage $\frac{1}{5}$.
- Lot 6—Corn $\frac{4}{5}$,
Cowpeas $\frac{1}{5}$.
- Lot 7—Corn alone.

1912-13:—

- Lot 1—Peanut pasture,
Corn — $\frac{1}{2}$ ration.
- Lot 2—Peanut pasture,
Tankage $\frac{1}{5}$
Corn $\frac{4}{5}$. } $\frac{1}{2}$ ration.
- Lot 3—Peanut pasture alone.
- Lot 4—Corn $\frac{2}{3}$,
Wheat shorts $\frac{1}{3}$.
- Lot 5—Corn,
Skim milk.
- Lot 6—Corn alone.
- Lot 7—Corn $\frac{4}{5}$,
Tankage $\frac{1}{5}$.
- Lot 8—Corn $\frac{4}{5}$,
Cowpeas $\frac{1}{5}$.

In 1911-12, the peanuts were not planted until July 12. The intention was to plant them the early part of June, as they followed a winter crop of oats, but the planting was delayed for more than a month by a drouth. The ground became too hard in June to plow. The rows were only 18 inches apart, and the seed, which were hulled, were put in at the rate of $1\frac{1}{2}$ bushels per acre. The soil of the field in which they were planted was of a sandy character but the fertility had been built up by previous applications of barn yard manure. Never-

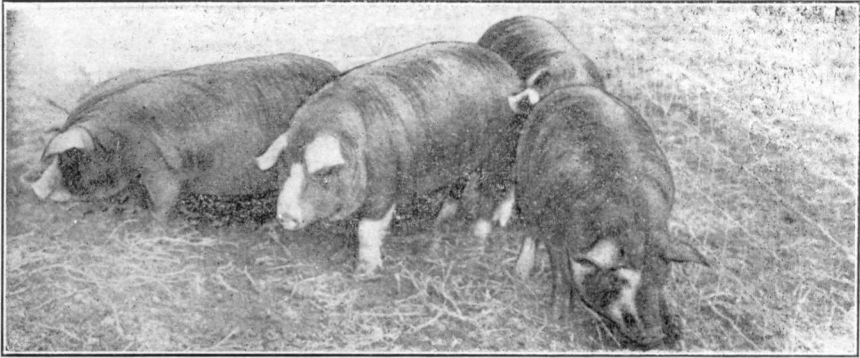


LOT 1. Picture taken at end of test, January 11, 1911. These pigs were grazed on a peanut pasture from October 6, to January 11, and fed on a partial corn ration as a supplement. During this time they made an average daily gain of 1.25 pounds. To make 100 pounds of increase in weight cost \$1.68 when corn alone is considered, and \$3.08 when both the corn and the pasture are considered.

theless, commercial fertilizers were put down at the rate of 140 pounds of 16% acid and 60 pounds of potash per acre. Although the nuts were planted late, a good crop was secured; an average of 79 bushels was made on each acre. They were ready to be grazed October 6, when the test of 1911-12 was inaugurated.

The crop for the second year's test was planted the last week in June on the land which was used the previous year. They were planted, fertilized, and cultivated practically as outlined for the crop the previous year. They made an unusually satisfactory growth and on September 16 the vines were cut for hay; the hay, however, was lost on account of continued rains. The hogs were turned onto the crop September 20. Although the crop was an unusually good one, the hogs failed to derive full benefit from it on account of excessive sprouting and rotting of the nuts in the ground. This sprouting and rotting was caused by the warm rains of September and October which were followed by extremely warm weather. There is no way to determine the exact loss in total food value, but the data presented later show that the second year's crop of nuts did not afford one-half as much feed per acre as the first year's crop.

In 1911-12, one lot of hogs, Lot 4, was given a ration of soy bean hay and corn. The proper amount of hay



LOT 2. Picture taken at end of test, January 11, 1911. These pigs were fed on a partial ration of corn and tankage along with peanut pasture. They grazed the peanuts from October 6 to January 11, and during this time made an average daily gain of 1.42 pounds, at a cost of \$1.95 a hundred when the grains only were charged against the gains, and \$2.96 when the cost of the pasture was also included among the items of expense.

was weighed out at each feed and thrown upon a dry cement floor. The seed were all clinging to the hay but a great part of the leaves had shattered off, so the seeds themselves were practically the only part of the hay available for feed.

The concentrated feeds were all bright and fresh. The tankage was purchased of Swift and Company. A part of the cowpeas was grown on the Station Farm and a part was purchased of neighboring farmers. The skim milk was fed within a few minutes after coming from the separator; the milk was therefore always sweet.

THE HOGS.

In 1911-12, the pigs (42 in number) were all purchased of Mr. Pace, a neighboring farmer living six miles south of Auburn. None of the animals was pure bred; all, however, showed the influence of improved blood; they were grade Berkshires. When brought to the Station Farm, August 15, 1911, they were about four months old and averaged approximately 60 pounds in weight. The experiment proper did not begin until October 6, and during the preliminary period from August 15 to October 6, the pigs were all confined in a

small lot and given a fattening ration of corn, shorts, and green sorghum; the sorghum was cut in the field and hauled to them.

In 1912-13, a part of the pigs was purchased of Mr. Pace—45 in all. The others were purchased of Mr. Sanders, a dairyman near Auburn. They were brought to the Station Farm August 25, 1912 and kept in a small pen and fed a ration of corn and wheat shorts until September 20 when the test proper was inaugurated. The pigs in this year's test averaged approximately 42 pounds in weight at the beginning. The majority of the animals showed considerable Berkshire blood; some were Poland-China grades, and three were grade Duroc-Jerseys.

SHED, LOTS AND FENCES.

The pasture lots, (Lots 1, 2, and 3) were given the run of the peanut pastures; that is, the hogs gathered the crops themselves. As the sun during the first weeks of the test was warm and no trees stood in the pastures, each lot was provided with a small, movable, and inexpensive hog house. The different areas of pasture were measured and hurdled off by temporary fences, so that an exact account could be kept of the area of peanut pasture grazed by each lot of hogs. This was done so that the cost of the area grazed could be charged against the gains of the hogs. However, the hogs were not given the run of the whole field at one time; small areas (about 1 acre to 10 pigs) were fenced off and when the inclosed patches were consumed the hurdles were moved onto new places.

The pigs which received no pasture feeds were confined in small lots; each lot was 20x60 feet. Across the east end of these lots was a continuous shed which afforded ample protection from the cold rains and the hot sun. The feeding was all done under this shed and in a long trough on a cement floor.

Water was kept before the animals all the time, as was also a dry mixture of equal parts of salt, charcoal and lime.

PRICES OF FEEDS.

Corn, per bushel	\$.70
Wheat shorts, per ton	36.00
Soy bean hay, per ton	15.00
Tankage, per ton	40.00
Cowpeas, per bushel	2.50
Skim milk, per hundredweight30
Peanut pasture, per acre	8.00

DETAILS OF THE TESTS.

Peanut pastures compared with corn and other high-priced feeds:—As stated above, the peanut pasture in 1911-12 was ready to be grazed by October 6. The crop this year afforded grazing until January 11 when the peanut part of the experiment was closed; this was a period of 96 days. In 1912-13, the test was inaugurated on September 20 and continued until November 20—a period of 61 days. The first year the nuts sprouted and rotted very little; during the second year there was a very great loss of nuts as a result of sprouting and rotting.

TABLE 1.—*Peanut Pastures Compared With Dry Feeds.*

1911-12

(October 6—January 11)

No. Pigs	RATION	Average daily gains	Feed to make 100 lbs. of gain	Grain cost to make 100 pounds of gain	Grain and pasture cost to make 100 pounds of gain	Value of 1 acre of Peanuts in terms of corn and tankage
6	Peanut pasture ----- Corn— $\frac{1}{2}$ ration -----	Lbs. 1.25	Lbs. .175 acre --- 134 corn ---	\$1.68	\$3.08	65 bushels
6	Peanut pasture ----- Corn $\frac{1}{3}$ ----- } $\frac{1}{2}$ ration --- Tankage $\frac{1}{3}$ ----- }	1.42	.126 acre --- 111 corn --- 28 tankage	\$1.95	\$2.96	34 bushels plus 476 lbs. tankage
6	Peanut pasture alone -----	1.00	.22 acre ---	-----	\$1.76	62 bushels
6	Soy bean hay ----- Corn— $\frac{1}{2}$ ration -----	1.07	778 hay --- 152 corn ---	\$7.74	\$7.74	
6	Corn $\frac{4}{5}$ ----- Tankage $\frac{1}{5}$ -----	1.10	353 corn --- 88 tankage	\$6.17	\$6.17	
6	Corn $\frac{4}{5}$ ----- Cowpeas $\frac{1}{5}$ -----	.38	545 corn --- 144 peas ---	\$12.81	\$12.81	
6	Corn alone -----	.33	776 corn ---	\$9.58	\$9.58	

1912-13

(September 20—November 20)

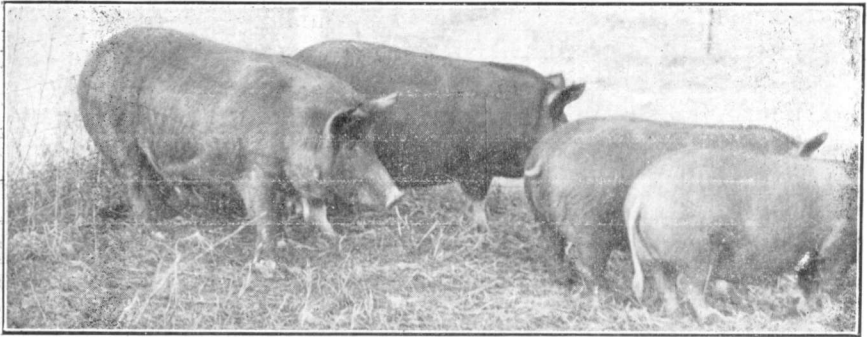
7	Peanut pasture ----- Corn— $\frac{1}{2}$ ration -----	0.76	.296 acre --- 113 corn ---	\$1.41	\$3.78	31 bushels
7	Peanut pasture ----- Corn $\frac{1}{3}$ ----- } $\frac{1}{2}$ ration --- Tankage $\frac{1}{3}$ ----- }	0.95	.252 acre --- 91 corn --- 23 tankage	\$1.60	\$3.62	20 bushels plus 476 lbs. tankage
7	Peanut pasture -----	0.75	.405 acre ---	-----	\$3.24	28 bushels
5	Corn $\frac{2}{3}$ ----- Wheat shorts $\frac{1}{3}$ -----	0.75	300 corn --- 150 shorts ---	\$6.45	\$6.45	
5	Corn, 1 part ----- Skim milk, 2.3 parts -----	1.38	221 corn --- 505 milk ---	\$4.28	\$4.28	
7	Corn alone -----	.31	635 corn ---	\$7.94	\$7.94	
7	Corn $\frac{4}{5}$ ----- Tankage $\frac{1}{5}$ -----	.48	376 corn --- 95 tankage	\$6.60	\$6.60	
7	Corn $\frac{4}{5}$ ----- Cowpeas $\frac{1}{5}$ -----	.21	628 corn --- 157 peas ---	\$14.39	\$14.39	

Greater gains were made in 1911-12 than in 1912-13, largely due to the fact, perhaps, that the pigs used in the first year's test were considerably the larger, there being an average difference in weight of approximately 20 pounds.

In 1911-12, all of the pigs made exceedingly satisfactory gains except those in Lots 6 and 7 where corn alone and corn plus cowpeas (the seed) were fed. The corn-fed pigs made an average daily gain of only .33 of a pound, while the corn- and cowpea-fed ones did but little better, they making an average daily gain of only .38 of a pound. The other pigs all made an average daily gain of more than one pound. The pigs which were fed on peanut pasture alone (Lot 3) made an average daily gain of 1 pound, those which received a partial ration of corn and tankage along with the pasture (Lot 2) gained at an average rate of 1.42 pounds daily, and the lot (Lot 1) which had the pasture supplemented with a partial ration of corn alone gained daily 1.25 pounds. The ration of soy bean hay and corn also proved to be, from the stand point of gains, a good feed, as the pigs fed on this combination gained 1.07 pounds daily.

In 1911-12, the peanut pastures, the soy bean hay, the tankage, and the peas all saved large amounts of corn, but some of these supplements were much more satisfactory than others; for instance, the peanut pastures proved to be much cheaper feeds than soy bean hay, peas, or tankage. When comparing Lots 1 and 7 it is seen that .175 of an acre of peanuts saved 632 pounds of corn; or, one acre of the nuts (a little more than an acre of nuts was used in this lot) was equal in feeding value, or took the place of, 65 bushels of corn. When comparing Lots 2 and 5, it is seen that .126 of an acre of nuts saved 242 pounds of corn plus 60 pounds of tankage; or one acre of the nuts was equal in feeding value to 34 bushels of corn plus 476 pounds of tankage. In Lot 3 nothing was fed but peanut pasture, and in this case (compare Lots 3 and 7) .22 of an acre of nuts pro-

duced as much gains on the hogs as did 766 pounds of corn; or, one acre of peanuts was equal in feeding value to 62 bushels of corn. Of course, the value of an acre of peanuts depends upon the yield; a poor crop gives poor returns, notwithstanding the fact that the hogs may (and usually do) make rapid gains. When comparing the results obtained in Lots 4 and 7 it is seen that 778 pounds of soy bean hay saved 614 pounds of corn; the hay saved a large amount of corn, but a large amount of hay was required to effect this saving. At this rate 1 ton of hay saved 1578 pounds (28 bushels) of corn; when corn is valued at 70 cents a bushel, one ton of the hay was therefore worth \$19.60 as a fattening feed for hogs when used in conjunction with corn. This hay was not worth \$19.60 on the market; in fact, it would have been a difficult proposition to have sold it as hay at all as practically all of the leaves had fallen. The column next to the last shows the total cost to make 100 pounds of increase in live weight. The peanut pastures were used to a very great advantage. The pastures were extremely good, consequently the cost of making the gains was extremely low. In Lot 1, where the pasture was supplemented with corn alone, each 100 pounds of increase in live weight cost \$3.08; in Lot 2, where both corn and tankage were used as supplements, the same increase in live weight cost only \$2.96; in Lot 3, where the peanut pasture constituted the whole feed, each 100 pounds of increase was made at an expense of only \$1.76. The hogs in the first two lots were in excellent condition at the end of the peanut period; they were ready to be killed or sold. While the pigs in Lot 3 were in fairly good condition at the end of the peanut period, still they were not fat enough to bring a good price, or produce acceptable carcasses for home use. The hogs in Lots 4, 5, 6, and 7 were fattened either at a loss or a very small profit. In Lot 4, where soy bean hay was employed as a supplement to corn, the gains cost \$7.74 per hundred; in Lot 5, where tankage and corn were used, the same amount of gain



LOT 3. This picture was taken at end of test, January 11, 1911. The pigs were fed peanut pasture alone. They grazed the pasture from October 6 to January 11, and during this time gained at the average rate of 1.0 pound daily. It cost \$1.76 to make 100 pounds of increase in weight when pasture is valued at \$8.00 an acre, or what it cost to make it. A similar bunch of hogs which were fed in a small lot on corn alone gained only .33 of a pound daily at an expense of \$9.58 a hundred.

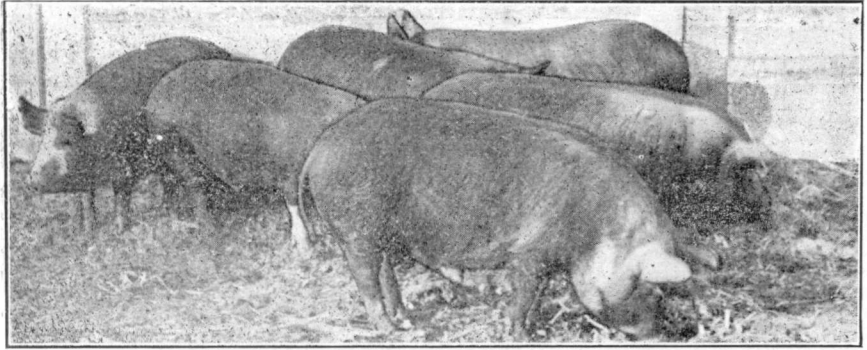
cost \$6.17. When cowpeas (the seed) were used to supplement the corn (Lot 6) the hogs were fattened at a very heavy loss, each 100 pounds of increase in weight costing \$12.81. In Lot 4, where corn was fed alone, each 100 pounds increase in weight cost \$9.58.

In 1912-13, three lots of hogs were fed on peanut pastures, the same supplements being used as in the test of the previous year. Altogether there were 8 lots of hogs in the test this year, five of which were fed on dry feeds of various kinds. It will be noted first that the gains this year were not, on the average, as great as the year before, due perhaps to the fact that the pigs in the second test averaged about 20 pounds lighter than the ones in the first test. It may have been, too, that the second pigs were not as thrifty as the first ones. However, when the rations were good the gains were not unsatisfactory in either case. In Lot 5, where the hogs were fed corn and skim milk, the gains were extremely large, being 1.38 pounds daily; with the exception of the gains in one lot (Lot 2) this was almost twice as great as the gains secured with any of the other rations and seven times as rapid as those realized in the lot where corn and cowpeas (the seed) were fed. As far as the peanut lots (Lots 1, 2, and 3) were concerned.

the most rapid gains were secured in Lot 2 where the pasture was supplemented with corn and tankage; similar results were obtained the year previous. All of the supplementary feeds, except cowpeas, effected a very great saving of corn and were used profitably, but some of them were used very much more profitably than others. The peanut pastures saved enormous quantities of corn, but, owing to rotting and sprouting of the nuts this year, so large returns per acre were not realized as the previous year. When comparing the results secured in Lots 1 and 6 it is seen that .296 of an acre of peanuts saved 522 pounds of corn; or, 1 acre of the nuts was equal in feeding value to 31 bushels of corn. The year previous a similar acre was equal to, or took the place of, 65 bushels of corn. When comparing the results in Lots 2 and 7 it is seen that .252 of an acre of nuts saved 285 pounds of corn plus 72 pounds of tankage; at this rate, 1 acre saved 20 bushels of corn plus 286 pounds of tankage. It is further seen that .405 of an acre of peanuts alone (compare Lots 3 and 6) produced 100 pounds of pork; 635 pounds of corn did the same thing; therefore .405 of an acre of nuts was equal in feeding value to 635 pounds of corn, or, one acre saved 28 bushels of corn. In considering the dry lots—those lots in which no pastures were employed—it is first seen (comparing Lots 4 and 6) that 150 pounds of wheat shorts saved 335 pounds of corn. The wheat shorts cost only \$36.00 a ton; in this test they were actually worth \$55.83 a ton when corn was valued at 70 cents a bushel. Considerable money was therefore saved by buying the wheat shorts at \$36.00 and feeding it in conjunction with corn. Skim milk (Lot 5) was used at a remarkable advantage. 505 pounds of skim milk saved 444 pounds of corn (Lots 5 and 6 compared). Skim milk is seldom valued at more than 30 cents a hundred pounds, but in this test 100 pounds of skim milk saved 82 pounds of corn; when corn was valued at 70 cents a bushel each 100 pounds of skim milk proved to have a value of \$1.03 in terms of corn saved. For some reason not known to

the authors the pigs which were fed on corn and tankage made unsatisfactory daily gains. Notwithstanding the fact that the gains were small the tankage saved no small amount of corn, as 95 pounds of tankage saved 259 pounds of corn. The tankage was valued at \$40.00 a ton. In this test each ton of tankage saved 5453 pounds of corn; when corn, therefore, was valued at 70 cents a bushel each ton of tankage proved to have a feeding value of \$68.16 in terms of corn saved. The cowpeas were again used at a very great loss, as 157 pounds of peas saved only 7 pounds of corn (Lots 6 and 8 compared). The hogs never became accustomed to the peas; they did not relish them. The next column to the last shows that the cheapest pork was made in the lots (Lot 1, 2, and 3) where peanut pastures were grazed. The gains were not made as cheaply as the year previous, but the peanut pastures all showed up to a marked advantage over any dry feed used. Each 100 pounds of increase in weight in Lots, 1, 2, and 3 cost \$3.78, \$3.62 and \$3.24 respectively; tankage was used to advantage in Lot 2 because it caused a saving of pasture. The hogs in Lot 3 made the cheapest gains but, like those of the previous year, were not fat enough for sale or slaughter at the end of the peanut period. In the dry lots (Lots 4, 5, 6, 7, and 8) the cheapest gains were realized in Lot 5 where skim milk constituted a part of the ration; each 100 pounds of increase in live weight being made at a cost of \$4.28. In Lot 4, where wheat shorts were employed as a supplement, it cost \$6.45 to produce an equal amount of increase in weight, while in Lot 6, where corn was fed alone, the gains cost \$7.94 per hundred. Tankage effected no small saving, as each 100 pounds of increase in weight in this lot cost only \$6.60. Cowpeas were used at a very great loss, as it cost \$14.39 to make 100 pounds of gain.

Pounds of pork made on each acre of peanuts:—One of the factors which controls the amount of pork made on an acre of pasture is the kind of crop grazed; no one expects to make a large number of pounds of pork



LOT 5. Picture taken at end of test, January 11, 1911. These pigs were fed from October 6 to January 11 on a ration made up of four-fifths corn and one-fifth tankage. During this time they gained at the average daily rate of 1.1 pounds. It cost \$6.17 to make 100 pounds of gain. In lots 1, 2, and 3, where peanut pastures were employed, it cost only \$3.08, \$2.96, and \$1.76, respectively, to make 100 pounds of increase in weight. The combination of corn and tankage, however, proved to be a very much cheaper feed than corn alone.

per acre as a result of grazing bermuda pasture. The amount of pork (and the cost, too) made on an acre of pasture depends, second, upon the amount of feed finally produced on each acre. A good acre of peanut pasture may produce from 500 to 600 pounds of pork; a poor acre may not produce 200 pounds of pork. This has a direct bearing also on the final cost of making the meat, as a poor crop usually costs practically as much to make as a good one—and oftentimes more. The table shows a wide variation in the amount of pork grown on each acre. The crops were both excellent, but the second one depreciated very greatly in value on account of the rotting and sprouting of the nuts after they had become mature.

TABLE 2.—Pounds of Pork Made on Each Acre of
Peanut Pasture.

1911-12

(October 6—January 11)

Lot	RATION	Total lbs. pork made on each acre	Total value pork made on each acre (7c gross)	Total value pork made on each acre after deducting cost of concentrates
		Lbs.		
1	Peanut pasture ----- Corn— $\frac{1}{2}$ ration -----	571	\$39.97	\$30.32
2	Peanut pasture ----- Corn $\frac{4}{5}$ ----- } $\frac{1}{2}$ ration-- Tankage $\frac{1}{5}$ ----- }	793	\$55.51	\$40.08
3	Peanut pasture alone -----	455	\$31.85	\$31.85

1912-13

(September 20—November 20)

		Lbs.		
1	Peanut pasture ----- Corn— $\frac{1}{2}$ ration -----	338	\$23.66	\$18.71
2	Peanut pasture ----- Corn $\frac{4}{5}$ ----- } $\frac{1}{2}$ ration-- Tankage $\frac{1}{5}$ ----- }	397	\$27.79	\$25.07
3	Peanut pasture alone -----	247	\$17.29	\$17.29

In 1911-12, from 455 to 793 pounds of pork, and the year following, from 247 to 397 pounds, were made on each acre; this was the case when the pastures received credit for certain amount of supplementary gains. In Lots 1 and 2 the pastures should not be credited with the full number of pounds of pork made, as grain was used to supplement the pastures; in Lots 3, however, the pastures deserve full credit for the pork made. Valuing the hogs at 7 cents a pound on foot, each acre of pasture in 1911-12 produced a sufficient number of pounds of pork to be worth \$30.32, \$40.08 and \$31.85 in Lots 1, 2, and 3, respectively, after the cost of the grains was deducted in each case. In 1912-13, such good results were not obtained; in this case each

acre of peanut pasture produced enough pork to be worth \$18.71, \$25.07 and \$17.29 in Lots 1, 2, and 3, respectively, after deducing the cost of the grains in each case.

Carrying capacity of 1 acre of Peanut Pasture:—It should be noted again that the pigs in 1911-12 averaged approximately 60 pounds in weight at the beginning of the test while in 1912-13 they had attained an average approximate weight of only 42 pounds. The following table shows both the average initial and average final weights of the hogs in each lot. Of course, the length of time one acre of peanuts carried a certain number of hogs depended first upon the size of the hogs, second, upon the amount and kind of supplementary grain, and third upon the yield of the crop.

TABLE 3.—*Number of Days One Acre of Peanuts Carried 10 Pigs.*

1911-12

(October 6—January 11)

Lot	RATION	Average initial weight of each pig	Average finish weight of each pig	Number of Days 1 acre carried 10 pigs
		Lbs.	Lbs.	Days
1	Peanut pasture ----- Corn— $\frac{1}{2}$ ration -----	56	177	46
2	Peanut pasture ----- Corn $\frac{4}{5}$ ----- } $\frac{1}{2}$ ration --- Tankage $\frac{1}{5}$ ----- }	60	197	56
3	Peanut pasture alone -----	61	159	45

1912-13

(September 20—November 20)

1	Peanut pasture ----- Corn— $\frac{1}{2}$ ration -----	42	94	41
2	Peanut pasture ----- Corn $\frac{4}{5}$ ----- } $\frac{1}{2}$ ration --- Tankage $\frac{1}{5}$ ----- }	42	100	42
3	Peanut pasture -----	43	88	32



LOT 7. Picture taken at end of test, January 11, 1911. These hogs were fed from October 6 to January 11 on corn alone. They, as usual on this feed, made very unsatisfactory gains; they gained .33 of a pound daily, while one lot (Lot 2) which had a good feed along with peanut pasture gained at the average rate of 1.42 pounds daily. When corn is valued at 70 cents a bushel it cost \$9.58 to make 100 pounds of gain.

In 1911-12, one acre of peanuts in Lots 1, 2, and 3 carried 10 pigs for 46, 56, and 45 days, respectively. The pigs of 1912-13 were smaller than the ones used the previous year, consequently the pastures during the second year's test gave reasonably good returns notwithstanding the fact that the grazing was cut short. The pastures in Lots 1, 2, and 3 afforded grazing for the 10 pigs for 41, 42, and 32 days, respectively. It is possible for the farmer to determine from the above data the area of peanut pasture crops which should be prepared and planted to accommodate a definite number of hogs.

Part II.

Fattening Hogs During the Winter Months on Rape, Rye and Oat Pastures

INTRODUCTION.

The farmer who carefully studies the business of making pasture crops for hogs experiences very little difficulty in providing suitable and satisfactory crops for summer and fall grazing, as the South is abundantly supplied with summer-growing crops. However, if entirely satisfactory profits are to be made on the hog business, winter grazing crops must also be provided; when winter crops are neglected the possible profits are often very greatly reduced during the cold months on account of feeding an undue amount of high-priced concentrated feeds. Many farmers know that it is not as simple and easy to establish and maintain winter as summer pastures, nevertheless grazing pastures can be provided throughout the cold months; as a matter of fact, our best farmers have been doing this for many years. As far as the authors know, there is no permanent system of pastures which affords grazing in Alabama for twelve months of the year, but animals need not be deprived of grazing a single day in the year when permanent pastures are supplemented and assisted by certain temporary grazing crops. Rape, rye and oats are all temporary crops which, if sown or planted during the fall of the year, afford a temporary grazing crop between the frost killing period of the fall and the early grazing crops of the spring. Other temporary winter crops may be used, but the work reported in this part of the bulletin has to do with only the three temporary crops mentioned.

EXPERIMENT A.

Rape Pasture for Fattening Hogs**OBJECTS OF THE WORK.**

It is not always practical and convenient for the farmer to fatten his hogs during the late summer and early winter months. Very often pigs are on hand which should be fed much later than December and January. As the hog business of the South develops and the farmers insist on obtaining two litters each year instead of one it will become more and more necessary for some of the animals to be fattened during the mid-winter and early spring months. Instead of carrying the fall pigs through the subsequent summer, many farmers are coming to believe that it is more profitable to prepare these fall-born pigs for the following spring market. When this system is adopted it becomes of especial importance to provide a green pasture crop for the fattening period. The work in fattening hogs on the winter crop, rape, was therefore undertaken with two objects in view:—

- (a) To compare dry-lot feeding during the mid-winter months with a grazing system of feeding with rape as the crop to be grazed.
- (b) To determine the most profitable amount of concentrated feeds to use in conjunction with the rape pasture.

THE FEEDS.

The 15 pigs were divided into three equal lots and fed as follows:—

Lot 1—Corn $\frac{2}{3}$
Wheat shorts $\frac{1}{3}$ } in dry lot.

Lot 2 —Corn $\frac{2}{3}$
Wheat shorts $\frac{1}{3}$, } $\frac{1}{2}$ ration.
Rape pasture.

Lot 3—Corn $\frac{2}{3}$
Wheat shorts $\frac{1}{3}$, } $\frac{1}{4}$ ration.
Rape pasture.

Both the corn and wheat shorts were purchased of a local dealer and were of good quality. The corn was

ground into a coarse meal on the Station Farm, mixed with the shorts, and the mixture fed to the hogs as a rather thin slop. In all the financial statements the corn is valued at 70 cents a bushel and the shorts at \$36.00 a ton; these valuations are somewhat less than present prices, as the price of feeds at the present time is probably abnormally high. However, the prices adopted fairly accurately represent the average farm values of these two feeds when a number of years are taken into consideration.

The rape pasture was planted September 19, 1910 on an exceedingly poor and sandy piece of ground. A good crop of soy beans preceded the rape crop. The ground was thoroughly broken with a two-horse plow, leveled with a smoothing harrow, and laid off in rows 18 inches apart. In these shallow furrows the seed were planted at the rate of 40 pounds to each acre, and covered by dragging a smoothing harrow along the rows. Many authorities recommend the use of no more than 6 to 8 pounds of seed to each acre, but as these rows were close together it was thought that it would be wise to be liberal with the seed as they cost only 6 or 8 cents a pound. As the soil was naturally very poor, a small application of phosphoric acid and potash was made; 140 pounds of phosphoric acid and 60 pounds of potash were used on each acre. On November 9, or 51 days after planting, the rape pasture was ready to be grazed. At this time the plants were from 6 to 8 inches high. This kind of a crop can be completely and quickly destroyed by grazing too closely and by turning too many hogs on at one time. It should be remembered that the rape plant will grow slowly but persistently throughout the winter months if the plants are not eaten off too close to the ground. In this test only 5 pigs, weighing approximately 45 pounds each at the beginning of the test, were turned into small lots which contained an area of approximately two-thirds of an acre. This small area, however, furnished grazing until spring. When man's labor is valued at 80 cents a day, a team with a driver at \$3.00 a day,

and seed at 6 cents a pound it cost exactly \$8.00 an acre to plant and cultivate the rape crop. This cost can very often be very greatly reduced; it is not always necessary to break the ground before the seed are planted especially when clean cultivation preceeded. When a crop of cleanly cultivated peanuts occupied the ground the summer preceeding it is usually necessary to only stir the ground with a disk harrow before planting the rape seed.

THE PIGS.

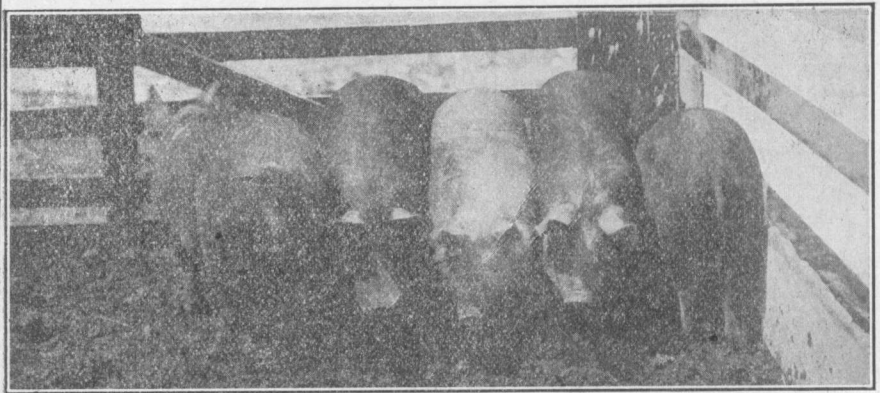
The pigs were not pure-bred animals; they were the average of the county, and were purchased from a neighboring farmer several days before the inauguration of the test. Two of them were grade Chester Whites, while the others were grade Berkshires and Poland-Chinas. Several weeks before the animals were brought to the Station Farm, they had been grazing a pea field, so were in an exceedingly thrifty condition when the test began; they were not fat, however. At the beginning of the test they averaged approximately 45 pounds in weight. The accompanying pictures show their general quality and appearance at the close of the test in April.

SHEDS, LOTS AND FENCES.

The pigs in Lot 1 were fed at the barn and had a good shed which protected them from the cold winter winds and rains. Those in Lots 2 and 3 could not come to the barns so simple and inexpensive hog houses were provided, one being placed in each rape pasture. The houses were placed with the open end to the south. The different areas of pastures were measured and hurdled off with temporary fences so that an exact account could be kept of the area of rape pasture grazed by each lot of hogs; this was done so that the cost of the area grazed could be charged against the gains of the hogs.

METHOD OF FEEDING.

Each lot of hogs was fed twice a day. The corn was



LOT 1. Picture taken at close of test. They were fed corn and wheat shorts, and made an average daily gain of .84 of a pound during the whole period of 147 days. It cost \$6.88 to make 100 pounds of increase in live weight.

ground into a coarse meal; this meal was mixed with the shorts and a sufficient amount of water to make a thin slop and poured into deep troughs. If ear corn is used the shorts should be made into a thin slop and poured into a separate trough before the corn is thrown out. All of the grains and concentrated feeds were fed fresh; that is, none of the feed was fermented, soaked or cooked.

The rape pastures were gathered by the hogs themselves. When this method of harvesting is followed the crop is never lost on account of rains or unfavorable weather. The hogs were turned into the pastures when the plants were 6 to 8 inches high. Some corn and shorts were used to supplement the pastures. As one of the objects was to learn the most profitable amount of grain to use along with rape pastures, different amounts of grain were used. In Lot 3 one-fourth of a full ration of grain was used; that is, an amount of grain equal to 1 per cent of the total live weight of the lot was fed each day; or, one pound of grain to each 100 pounds of live weight was given daily. In Lot 2 two pounds of grain to each 100 pounds of live weight were fed each day. (This is a one-half ration of grain.)

The amount of feed given the pigs confined in the dry lot, Lot 1, was determined by their appetites. No feed was left in the troughs from one feeding time to the next. The aim was to give just enough feed so that the troughs would be clean within 30 minutes after feeding. If the ration is a palatable one, dry-lot-fed hogs will consume daily an amount of grain equal to about four per cent of their total live weight.

DETAILS OF THE TEST.

As stated above, the rape crop was planted September 19 and the hogs began grazing it November 9; fifty one days, therefore, intervened between the time of planting and the date of inaugurating the test. Rape is an unusually rapidly maturing crop.

TABLE 4.—*Rape Pasture vs. Dry-Lot Feeding, and the Most Profitable Amount of Grain to Use With the Pasture.*

(November 9—April 5)
(147 days.)

Lot	RATION	Average daily gains	Feed to make 100 pounds of pork	Grain cost to make 100 pounds of pork	Grain plus pasture cost to make 100 lbs. of pork	Value of 1 acre in terms of corn and shorts
		Lbs.	Lbs.			
1	Corn $\frac{2}{3}$ ----- Wheat Shorts $\frac{1}{3}$ ---	.84	320 corn ----- 160 shorts -----	\$6.88	\$6.88	---
2	Corn $\frac{2}{3}$ ----- Wheat Shorts $\frac{1}{3}$ --- ($\frac{1}{2}$ ration) Rape Pasture -----	.71	172 corn ----- 86 shorts ----- .15 acre rape---	\$3.70	\$4.90	\$21.20
3	Corn $\frac{2}{3}$ ----- Wheat Shorts $\frac{1}{3}$ --- ($\frac{1}{4}$ ration) Rape Pasture -----	.54	110 corn ----- 55 shorts ----- .22 acre rape---	\$2.37	\$4.13	\$20.49

The daily gains were not large in any case, being only .84, .71 and .54 pounds in Lots 1, 2 and 3, respectively. The gains in Lot 1, where corn and shorts were fed alone, were satisfactory when the initial size of the pigs is considered; they averaged approximately 45 pounds in



LOT 2. Picture taken at close of test. These pigs were fed on a rape pasture plus a partial ration of corn and wheat shorts. They grazed the rape from November 9 to April 5, and during this time made an average daily gain of .71 of a pound. In terms of grain it cost \$3.70 to make 100 pounds of gain; when the cost of both the grain and the pasture are charged against the gains it cost \$4.90 to make the 100 pounds, as compared to \$6.88 in Lot 1 where corn and shorts were fed alone.

weight at the inauguration of the test. Of course, the pigs which were grazing the rape pastures could have been made to make larger gains but more rapid gains would have been accomplished at the expense of high-priced feeds; the object in introducing the rape pasture was to save as much grain as possible and force the animals to make a liberal use of the cheap pasture and this could only be accomplished by feeding the grain sparingly. While the hogs in Lots 2 and 3 made rather small gains, nevertheless they were in acceptable killing condition on April 5, or 147 days after the feeding period began. They were not, however, as fat and acceptable as the animals in Lot 1. Yet there is no doubt but that it paid, and paid exceedingly well, to limit this grain part of the ration to a small amount.

By examining column 4 it may be seen that the rape pastures saved no little amount of corn and shorts. When Lots 1 and 2 are compared it is learned that .15 of an acre of rape saved 148 pounds of corn and 74 pounds of shorts; or, one acre of rape (approximately the area actually used in this lot) saved 17.6 bushels of corn and

493 pounds of shorts. When corn is valued at 70 cents a bushel and shorts at \$36.00 a ton one acre of rape was actually worth \$21.20 in feeding value. The expense of planting and cultivating this acre was only \$8.00. Almost as satisfactory results were secured in Lot 3. In this lot .22 of an acre saved 210 pounds of corn and 105 pounds of shorts; or one acre of rape (approximately the area grazed in this lot also) saved 17.0 bushels of corn and 477 pounds of shorts. When corn and shorts are valued as above one acre of the rape actually saved \$20.49 worth of corn and shorts.

In the lots where the rape pastures were employed the cost of making gains in weight was very materially smaller than in the lot where dry feeds alone were fed. It cost \$6.88 to make 100 pounds of increase in live weight in Lot 1 where corn and shorts were fed alone. In Lots 2 and 3, where rape pastures were grazed, the grain cost to make equal gains was reduced to \$3.70 and \$2.37 respectively. When the expense of planting and cultivating the pastures is also added to the cost of the pork (see column 6) the total cost of making 100 pounds of increase in live weight in Lots 2 and 3 was raised to \$4.90 and \$4.13; the hogs in Lots 2 and 3, therefore, were fattened at an entirely satisfactory profit, while the ones which were finished on corn and shorts in a dry lot were fattened at a loss, or, at least, at an unsatisfactory profit.

It is of great interest to the farmer to know just how much grain to feed along with pasture crops. Feeders are not yet agreed as to the proper amount of corn to use with a pasture. Some claim that no grain at all should be used with a good pasture; others claim that better results are secured when a full ration of corn is used along with the pastures. Of course, all agree that the amount of grain fed depends upon the kind of pasture used and whether the animals are just "being carried along," or are being rushed to a finish. Every feeder agrees, however, that hogs which are being fattened on a rape pasture must have some additional grain. Rape alone will produce little, if any, gains in weight, although

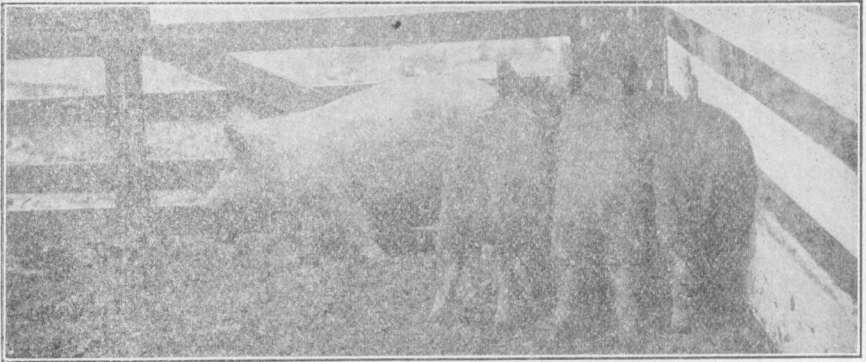
a good rape pasture will maintain dry breeding sows without the addition of any kind of grain.

The above work was outlined to determine the proper amount of corn to use along with rape pastures when hogs were being fattened. To do this accurate accounts were kept both of the amount of pasture consumed by each lot of hogs, and the cost of putting in and cultivating the crops.

It seems clear that several points must be taken into consideration before one can determine the right amount of corn to feed along with pastures when hogs are being finished for the market. A definite answer cannot be given to the question, How much corn shall I use with my pasture? First, the condition of the hog at the end of the feeding period must be taken into account. The hog which has received a light grain feed along with pasture will not be in as good killing condition at the end as will the one that has received a heavy grain feed, notwithstanding the fact that the former may have gained as rapidly as the latter. The first hog is not worth as much as the latter to the butcher. For instance, the hogs killed out of Lot 3 (one-fourth grain ration) dressed only 68.6 per cent, those killed out of Lot 2 (one-half grain ration) dressed 71.2 per cent, while the ones from Lot 1 dressed 81.2 per cent. The increased amount of grain had a beneficial effect upon both the carcass and the conformation. The hog which receives a small allowance of grain, in addition to a pasture, comes through to the end with a big belly region and a rather small deposition of fat; this causes him to dress a low percentage of marketable meat. For this reason the buyer is compelled to deduct from the price of the hogs which have received the small grain ration. Although he may gain as rapidly as the animal which received a heavy grain ration, still he is not in as acceptable killing condition as the heavy grain-fed hog. Second, the amount of corn at the disposal of the feeder must also receive consideration. When there are large amounts of corn on the farm to be disposed of, there is no better

way to market it than through hogs on pasture, so the problem may resolve itself into a question of finding a good and high-priced market for corn. When this is the case, it is no doubt a wise plan to feed the animals liberally of the corn so that the supply may all be used before the spring months arrive. Third, the amount of available pasture will have something to do with the amount of grain to feed. If the area of pasture is small for the number of hogs on hand, it will pay to be liberal with the grain in order that the pasture may be extended over as long a period of time as possible. The grain will save the pasture, as the above figures show, and all of the hogs will have a greater opportunity to get the benefit of some pasture. That is, it is no doubt better to save the pasture (when pasture is scarce) with an increased amount of grain, than to graze the pasture down rapidly on account of withholding grain. Fourth, the amount of grain used depends also upon the length of time the farmer has to get the animals ready for the market. If the animals must be killed or sold within a few weeks it may pay to use a heavy grain ration with the pasture, as the hogs will gain much more rapidly upon a full than upon a light grain ration. When prices are low, and there is a good prospect for an advance, it may be wise to simply carry the hogs along on the pasture, plus a light grain ration, until the prices advance. If hogs are selling at a good figure, and there is danger of a fall in prices, it is the part of wisdom to finish rapidly through the liberal use of grain.

Carrying Capacity of the Rape Pasture:—The pigs averaged approximately 45 pounds in weight at the inauguration of the test, November 9. At the end they had attained an average weight of 137 pounds. In Lot 2, where a half ration of grain was fed along with the pasture, the 5 hogs grazed .79 of an acre of rape for 147 days. In Lot 3, where only a fourth ration of grain was used to supplement the pasture, 4 pigs (one pig was accidentally shot on the 52nd day) grazed .76 of an acre for 147 days. That is, the above area, less than one acre,



LOT 3. Picture taken at close of test. These pigs were fed on a rape pasture plus a very small allowance of corn and wheat shorts. They grazed the rape from November 9 to April 5, and during this time made an average daily gain of .54 of a pound. In terms of grain it cost \$2.37 to make 100 pounds of increase in weight; in terms of the cost of both the grain and the pasture it cost \$4.13 to make 100 pounds of gain, as compared to \$6.88 in Lot 1 where corn and shorts were fed alone.

afforded grazing for the above number of pigs during the five winter months. The supply of rape was not exhausted when the test closed on April 5; in fact, the plants were growing more luxuriantly on this date than at any time previously, but it was necessary to close the test and plow the ground for a summer crop. The farmer who has a good soil can secure better results than the above as the soil on which these pastures grew was exceedingly poor and sandy.

Pounds of Pork Made on Each Acre of Rape:—The Alabama farmer is not taking advantage of his opportunities unless he uses at least part of his farm during the winter months. This can be done to very great advantage and profit when rape is planted and grazed off by hogs; the following table illustrates this point:—

TABLE 5.—*Pounds of Pork Made on Each Acre of Rape.*

Lot	RATION	Total pounds of pork made on each acre	Total value of pork made on each acre	Total value pork made on each acre after value of corn and shorts is deducted (7 cents gross)
		Lbs.		
2	Corn $\frac{2}{3}$ ---- } $\frac{1}{2}$ ration ---- Shorts $\frac{1}{3}$ ---- } Rape pasture -----	667	\$46.69	\$22.04
3	Corn $\frac{2}{3}$ ---- } $\frac{1}{2}$ ration ---- Shorts $\frac{1}{3}$ ---- } Rape pasture -----	455	\$31.85	\$21 10

In Lot 2 there were 667 pounds of pork made on each acre of rape; only 455 pounds were secured on an equal area in Lot 3. Of course, the grain part of the rations assisted in producing the increase in live weight; the rape pasture did not do this alone. But when the cost of the grain used is taken into consideration and deducted from the total value of pork made on each acre it is seen that each acre of rape in Lots 2 and 3 is still credited with a value of \$22.04 and \$21.10 respectively. When measured in terms of pork made each acre of the pasture was exceedingly valuable. This return was secured, too, during the winter months—just the time of year when the average farmer makes no use at all of his lands.

FINISHING THE HOGS IN DRY LOTS AFTER THE PASTURES ARE EXHAUSTED.

The following extract is taken from bulletin 154 which was issued from this Station in 1911:

“The majority of the farmers of the South who make use of green crops for fattening hogs sell, or slaughter, the animals when the crops are gone without finishing them upon grain for a short time in a dry lot. It is the usual custom in Alabama to shut the hogs up in a small pen when the fattening time arrives; this is not a wise practice as the preceding figures show. But there is a time when the hogs should be penned up in a dry lot and fed grain alone, but that time is not at the beginning of the fattening operations. They should be inclosed in a dry lot and fed grain alone for a short time after the grazing crops are exhausted. There are two reasons for following this plan. First, the hogs after coming off the pasture are in just the proper condition to make gains rapidly and economically for a short time. The table below illustrates this point. They are in excellent health and, as a rule, their frames not covered with as much fat as they should carry. The pasture, being a feed rich in protein, has tended to develop the frame work and muscles at the expense of fat, especially if the animals are

young. After they are fed in a pen from 21 to 28 days they look better, and are better, than when they came off the pasture; they are worth more to the butcher, or consumer, as they are fatter and dress out a higher percentage of marketable meat than if they had been sold directly off the pastures. There is a limit, though, to the length of time hogs can be fed in this finishing period; they soon reach a stage where the gains are made at a heavy expense. Second, when hogs have been grazed upon peanuts, soy beans, and several other crops, the meat and the lard have become soft. (Rape, however, does not have this undesirable effect). This makes the carcass objectionable to the butcher as well as for home consumption. The soft meat is hardened very materially when the hogs are fed upon grain for only a short time after the crops are exhausted. Some feeds are better than others during the hardening period. The longer the animal is fed upon a finishing feed the harder becomes the flesh and the lard, but, of course, the feeder must give due consideration to the question of economy, so cannot extend this period over a very long period of time."

The following table shows that the hogs are in condition for making relatively rapid and economical gains when taken off green pastures, confined in small lots for a short period, and fed grains alone:—

TABLE 6.—*Finishing Hogs in a Dry Lot After the Rape Pastures are Exhausted.*

Lot	Ration during finishing period	Ration during period preceding finishing period	Average daily gain	Feed to make 100 pounds of gain	Cost to make 100 pounds of gain
1	Corn $\frac{2}{3}$ ----- Wheat shorts $\frac{1}{3}$ -----	Corn $\frac{2}{3}$ ----- Wheat shorts $\frac{1}{3}$ -----	Lbs. .81	Lbs. 438 corn 219 shorts	\$9 42
2	Corn $\frac{2}{3}$ ----- Wheat shorts $\frac{1}{3}$ -----	Corn $\frac{2}{3}$ ----- } Wheat shorts $\frac{1}{3}$ } $\frac{1}{2}$ ration Rape pasture-----	.80	418 corn 209 shorts	\$8.99
3	Corn $\frac{2}{3}$ ----- Wheat shorts $\frac{1}{3}$ -----	Corn $\frac{2}{3}$ ----- } Wheat shorts $\frac{1}{3}$ } $\frac{1}{2}$ ration Rape pasture-----	1.05	278 corn 139 shorts	\$5 98

EXPERIMENT B.

Rape and Rye Pastures for Fattening Hogs During the Winter Months

Experiment B was also carried on during the winter of 1910-11. On account of the fact that the rye crop was late in reaching the grazing stage the inauguration of the test was postponed until December 3. The grazing part of the test continued until March 29 when the hogs were taken to the barns and inclosed in small dry lots for a short finishing period.

OBJECTS OF THE WORK.

This piece of work was undertaken with the following objects in view:—

- (a) To determine the value of rape and rye crops for fattening hogs during the winter months.
- (b) To determine the relative value of rape and rye pastures when used for fattening hogs.

THE FEEDS.

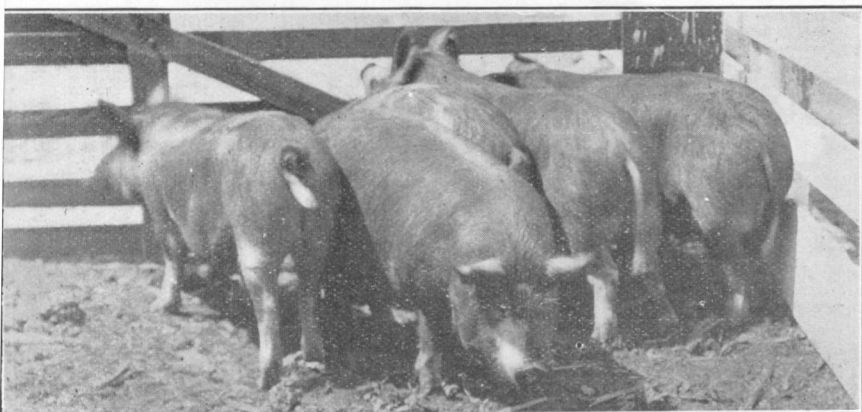
Corn, tankage, rye, and rape pastures were fed in various combinations. The 15 hogs were divided into three equal lots and fed the following rations:—

Lot 1—Corn $\frac{4}{5}$ }
 Tankage $\frac{1}{5}$ } in dry lot.

Lot 2—Corn $\frac{4}{5}$ }
 Tankage $\frac{1}{5}$ } $\frac{1}{2}$ ration.
 Rye pasture.

Lot 3—Corn $\frac{4}{5}$, }
 Tankage $\frac{1}{5}$ } $\frac{1}{2}$ ration,
 Rape pasture.

The corn was ground into a coarse meal, mixed with the tankage, made into a rather thin slop by the addition of water and poured into long, flat troughs. The feeds were not soaked or soured; they were fed in a fresh condition at each meal. The pasture crops were fenced off with movable fences and an exact account kept of the area of pasture grazed in each lot. The pastures were planted on September 19, the rape being a part of the

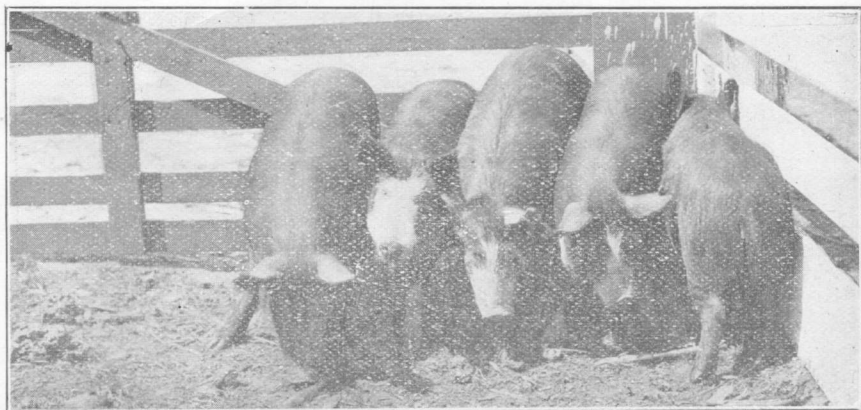


LOT 1. Picture taken at close of test. These hogs were fed on a ration of corn and tankage from December 3 to March 29, and during this time made an average daily gain of .91 of a pound. It cost \$5.86 to make 100 pounds of gain.

planting which was used in Experiment A; the rye, which was mixed with vetch seed, was sown broadcast at the rate of 1.5 bushels to the acre; 20 pounds of vetch seed were sown on each acre. The rape was fully ready to be grazed by November 9, but the inauguration of the test was delayed until December 3 on account of the rye making a slow growth. However, the rye pasture was ready by December 3; on this date the ground was practically covered with green growth. The vetch, however, had made practically no growth up to December 3. In fact, the vetch afforded no grazing before March 29, when the test was closed. At the inauguration of the test the rape plants were from 7 to 9 inches tall and practically covered the ground although planted in rows 18 inches apart.

THE HOGS.

The pigs used in this test were purchased of a neighboring farmer and the average initial weight was approximately 60 pounds. They were grade Berkshires and Poland Chinas. For a period of probably two weeks before the Station authorities purchased them, they had been fed on corn in a dry lot but were, nevertheless, in



LOT 2. Picture taken at close of test. These hogs were grazed on a rye pasture from December 3 to March 29, and during this time gained at the average rate of .63 of a pound daily. It cost \$4.34 to make 100 pounds of increase in weight.

a thrifty and growing condition. When brought to the Station Farm on November 28, all of the pigs were placed on a feed of corn and tankage; this ration was continued until the test began.

The hogs in this test were given the same kind of treatment and shelter as these in Experiment A.

DETAILS OF THE TEST.

As stated above, the crops were planted September 19, but the rye pasture was not ready to be grazed until December 3; the rape pasture was ready by November 9. On December 3, the hogs were divided into three lots, one of which was fed in a dry lot on corn and tankage, a second lot on corn and tankage and rye pasture, and a third lot on corn and tankage plus rape pasture. The pasture period of feeding continued until March 29 when the animals were all taken off pasture, brought to the barns, and finished for a short period on dry feeds. The following table gives a summary of the pasture period:

TABLE 7.—*The Value of Rape and Rye Pastures for Fattening Hogs During the Winter Months.*

(December 3—March 29)

(116 days.)

Lot	RATION	Average daily gains	Feed to make 160 pounds of gain	Grain cost to make 160 pounds of gain	Value of 1 acre in terms of corn and tankage
1	Corn $\frac{1}{3}$ ----- Tankage $\frac{1}{3}$ -----	Lbs. .91	Lbs. 334 corn --- 84 tankage	\$5.86	-----
2	Corn $\frac{1}{3}$ ----- } Tankage $\frac{1}{3}$ ----- } $\frac{1}{2}$ ration----- Rye pasture-----	.63	248 corn --- 62 tankage .36 acre rye	\$4.34	\$4.21
3	Corn $\frac{1}{3}$ ----- } Tankage $\frac{1}{3}$ ----- } $\frac{1}{2}$ ration----- Rape pasture-----	.68	230 corn --- 58 tankage .13 acre rape	\$4.04	\$14.01

The rape and rye pastures were not exhausted when the test closed on March 29. On account of the warm weather they were, in fact, better than they had been at any time during the test, but it was necessary to plow the field for another crop, so the grazing part of the test was brought to a close. On account of the fact that full and complete use was not made of the pastures no column is introduced into the above table to show the cost of gains when the cost of the pasture, as well as the cost of the grains, is charged against the increase in live weight. It would not be fair to charge the cost of the pastures against the gains when the rye pasture, if permitted, would have grown into almost a full rye crop after the hogs were taken off.

When the feeding began the pigs averaged approximately 60 pounds in live weight; when the initial size is considered it is seen that the daily gains were only fairly satisfactory. However, no attempt was made to secure large gains, especially in Lots 2 and 3. In these two lots the main object was to compel the animals to make as much use as possible of the cheap pasture crops. Larger gains could have been easily secured in Lots 2 and 3 by increasing the amounts of corn and tankage, but more rapid gains would probably have been made at an increased expense.

Although nothing like full use was made of the pas-

tures, yet .36 of an acre of rye pasture saved 86 pounds of corn and 22 pounds of tankage (compare Lots 1 and 2); or, one acre of rye pasture saved 4.3 bushels of corn and 60 pounds of tankage. When corn is valued at 70 cents a bushel and tankage at \$40.00 a ton, this represents a saving of \$4.21; or, each acre of rye pasture was worth \$4.21 for grazing purposes, and was capable of making practically a full crop after the period of grazing. When Lots 1 and 3 are compared it is noted that .13 of an acre of rape saved 104 pounds of corn and 26 pounds of tankage; or, one acre of rape pasture saved 14.3 bushels of corn and 200 pounds of tankage. When corn and tankage are valued as above one acre of rape therefore saved \$14.01 worth of corn and tankage. The rape, unlike the rye, was not capable of growing into a useful crop after the grazing was discontinued. The above figures do not, however, represent the full grazing capacity of an acre of rape pasture; when the hogs were taken from the pasture much rapidly growing rape was still on the ground. When, however, the expense of making the rape pasture is also charged against the gains in weight, the total expense of making 100 pounds of pork in this lot is brought up to \$5.08.

In this connection there is an important practical point that the farmer should get, namely, that rape pasture has a very much greater carrying capacity than rye pasture. It may be noted from the above table that .36 of an acre of rye pasture was required to assist in producing 100 pounds of increase in live weight, while only .13 of an acre of rape pasture answered the same purpose. Five hogs were given the run of 1.3 acres of rye pasture where only .5 of an acre of rape pasture carried an equal number of similar hogs.

FINISHING HOGS IN DRY LOTS AFTER TAKING THEM OFF PASTURE.

On March 29 the hogs were taken off the rape and rye pastures, enclosed in small, dry lots, and fed dry feeds only. It usually pays to finish hogs in this way. The following table shows the result in this particular test:—

TABLE 8.—*Finishing Hogs in Dry Lots After Taking Them Off Rape and Rye Pastures.*

(March 29—April 26)

(28 days.)

Lot	Ration during finishing period	Ration during period preceding finishing period	Average daily gains during short finishing period	Feed to make 100 pounds of gain	Cost to make 100 pounds of gain
1	Corn $\frac{4}{5}$ ---- Tankage $\frac{1}{5}$ -	Corn $\frac{4}{5}$ ----- Tankage $\frac{1}{5}$ -----	Lbs. 1.10	Lbs. 362 corn --- 90 tankage	\$6.32
2	Corn $\frac{4}{5}$ ---- Tankage $\frac{1}{5}$ - Rye pasture	Corn $\frac{4}{5}$ ---- } $\frac{1}{2}$ ration Tankage $\frac{1}{5}$ } Rye pasture-----	.87	440 corn --- 110 tankage	\$7.70
3	Corn $\frac{4}{5}$ ---- Tankage $\frac{1}{5}$ -	Corn $\frac{4}{5}$ ---- } $\frac{1}{2}$ ration Tankage $\frac{1}{5}$ } Rape pasture-----	.91	398 corn --- 99 tankage	\$6.96

The results secured in this finishing period are not in harmony with those secured in former work.* Heretofore hogs taken off pasture crops and finished in dry lots for short periods of time made more economical gains during this short period than those which had been fed continuously in dry lots. In this test the results are reversed. That is, the hogs in Lot 1, the lot which was fed continuously on dry feeds, made cheaper gains during the finishing period of 28 days than did the animals in Lots 2 and 3. This is very unusual.

SUMMARY STATEMENTS.

EXPERIMENT A.

1. The 15 pigs employed in this test were divided into three lots and fed the following rations:

Lot 1—Corn $\frac{2}{3}$.
Wheat shorts $\frac{1}{3}$.
Rape pasture.

Lot 2—Corn $\frac{2}{3}$.
Wheat shorts $\frac{1}{3}$ } $\frac{1}{2}$ ration.
Rape pasture.

*See Alabama Station Bulletins 143 and 154.

Lot 3.—Corn $\frac{2}{3}$.
 Wheat shorts $\frac{1}{3}$. } $\frac{1}{4}$ rations.
 Rape pasture.

2. The rape crop was planted September 19. It was ready to be grazed by November 9, so the test was inaugurated on the last date. The test continued until April 5, covering a total period of 147 days.

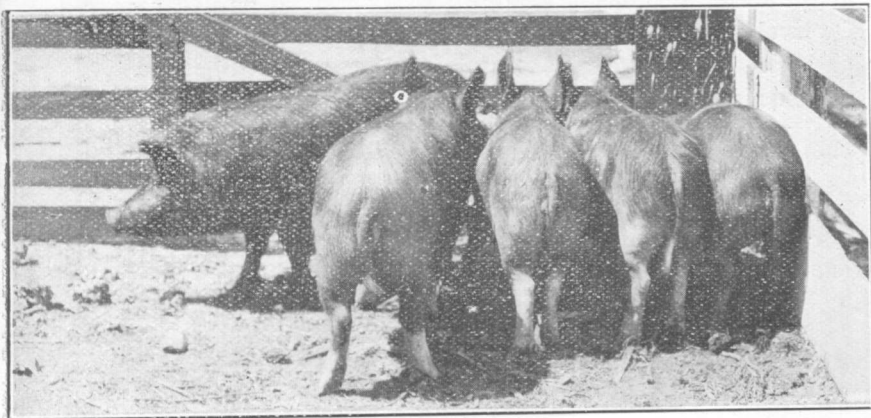
3. The pigs, which averaged approximately 45 pounds in weight at the beginning of the test, made average daily gains of .84 of a pound, .71 of a pound, and .54 of a pound in Lots 1, 2, and 3, respectively.

4. To make 100 pounds of increase in live weight required 320 pounds of corn plus 160 pounds of shorts in Lot 1; 172 pounds of corn plus 86 pounds of shorts plus .15 of an acre of rape in lot 2; and 110 pounds of corn plus 55 pounds of shorts plus .22 of an acre of rape in Lot 3.

5. When the cost of the grain alone was charged against the gains, it cost \$6.88, \$3.70, and \$2.37 to make each 100 pounds of increase in weight in Lots 1, 2, and 3, respectively; but when the expense of making the rape pasture was also charged against the gains in live weight, it cost \$6.88, \$4.90, and \$4.13 to make each 100 pounds of increase in weight in the respective lots.

6. The rape pastures proved to be exceedingly valuable as hog feeds. It cost only \$8.00 an acre to make them, but they were actually worth, in terms of corn and shorts saved, \$21.20 an acre in Lot 2, and \$20.49 an acre in Lot 3.

7. In Lot 2 there were 667 pounds of pork made on each acre of rape; in Lot 3 only 455 pounds of pork were made on an equal area. The rape pastures, however, should not receive credit for all of this increase in weight, as some corn and shorts assisted in producing the gains. But when the cost of the grain eaten is taken into consideration and deducted from the total value of the pork made on each acre it is finally determined that each acre of rape in Lots 1 and 2 is still



LOT 3. Picture taken at end of test. These pigs were grazed on a rape pasture from December 3 to March 29 and were fed on a partial grain ration of corn and tankage as a supplement. During this time they made an average daily gain of .68 of a pound. When the cost of the grain alone was charged against the gains it cost \$4.04 to make 100 pounds; when the cost of pasture was also considered the figure was raised to \$5.08, as compared to \$5.86 in Lot 1 where corn and tankage were fed alone.

credited with \$22.04 and \$21.10 respectively. (Hogs at 7 cents, gross weight.)

EXPERIMENT B.

1. The 15 pigs in this test were divided into three equal lots and fed the following rations:

Lot 1—Corn $\frac{4}{5}$.
Tankage $\frac{1}{5}$ } in dry lot.

Lot 2—Corn $\frac{4}{5}$.
Tankage $\frac{1}{5}$ } $\frac{1}{2}$ ration.
Rye pasture.

Lot 3—Corn $\frac{4}{5}$.
Tankage $\frac{1}{5}$ } $\frac{1}{2}$ ration.
Rape pasture.

2. The crops were planted September 19. The rye was not ready to be grazed until December 3, so the test was inaugurated on that date. The test was closed March 29, or 116 days after its inauguration.

3. The pigs, which averaged approximately 60 pounds in weight at the beginning of the experiment, made average daily gains of .91 of a pound; .63 of a

pound, and .68 of a pound in Lots 1, 2, and 3, respectively.

4. To make 100 pounds of increase in live weight required 334 pounds of corn plus 84 pounds of tankage in Lot 1, 248 pounds of corn plus 62 pounds of tankage plus .36 of an acre of rye pasture in Lot 2, and 230 pounds of corn plus 58 pounds of tankage plus .13 of an acre of rape pasture in Lot 3.

5. When the cost of the grain alone was charged against the gains, it cost \$5.86, \$4.34, and \$4.04 to make each 100 pounds of increase in live weight in Lots 1, 2, and 3, respectively.

6. Neither the rye pasture nor the rape pasture was completely consumed. For this reason no estimate was made to show the cost of the gains when the cost of the pastures were added to the cost of the grain. In fact, the rye pastures would have grown into almost a full rye crop after the hogs were taken off. Notwithstanding the fact that the pastures were incompletely used, each acre of rye pasture saved \$4.21 worth of grain and each acre of rape pasture saved \$14.01 worth of grain.

7. Rape pasture had practically three times as great carrying capacity as the rye pasture. 5 hogs were given the run of 1.3 acres of rye pasture; only .5 of an acre of rape pasture carried an equal number of similar hogs.

Part III.

LOCAL EXPERIMENT WORK.

The last session of the Legislature made an appropriation of \$27,000 to be expended under the direction of the Board of Trustees of the Alabama Experiment Station to study methods and make tests and experiments "for the advancement of agriculture and to prepare the farmers of Alabama for the coming of the boll weevil by providing for local agricultural experiments in the several counties of Alabama, to ascertain the best methods of producing cotton profitably in the presence of the boll weevil and of the black root disease, to determine the most effective methods for controlling the boll weevil and the other insect pests, to determine the most profitable field crops for each soil and the best system for growing and marketing them, to ascertain the grasses and clovers best suited to each soil, to ascertain the best varieties of fruits and vegetables and the best horticultural practices, to determine the best means of growing, feeding and marketing live stock and poultry, to investigate other agricultural problems, to provide for agricultural extension work, and to make an appropriation for these purposes and to prescribe how these funds shall be expended."

Of the total amount appropriated, \$4500 was set aside for the authorities of the Animal Industry Department to make experiments along the lines of feeding and breeding hogs, beef cattle, and poultry. A partial report of the beef feeding work has been recently published as Station Bulletin 163. A partial report of the poultry work is to soon be made. The following pages embrace an incomplete report of the tests which have been made with hogs. Later reports will be made from time to time as information accumulates.

The portion of the swine work herein reported was done in cooperation with four of the District Agricultural Schools. Sufficient funds were not available to in-

augurate the work with all of these schools, so those representing the four different corners of the State were selected.

Experiment A. Hamilton School

Twenty pigs were used in the experimental work at Hamilton during the summer and fall of 1911. These twenty pigs were divided into four uniform lots and fed the following ration:—

- | | | |
|-----------------------|---|-------------|
| Lot 1—Corn 9/10, | } | in dry lot. |
| Tankage 1/10, | | |
| Lot 2—Corn 9/10, | } | ½ ration, |
| Tankage 1/10 | | |
| Cowpea pasture. | | |
| Lot 3—Corn 4/5, | } | ½ ration, |
| Wheat shorts 1/5 | | |
| Cowpea pasture. | | |
| Lot 4—Corn, ½ ration, | | |
| Cowpea pasture. | | |

FEEDS.

The concentrated feeds, which were mixed with water and made into a rather thin slop, were divided between two equal feeds each day. Two crops of cowpeas were provided for the hogs. The first crop was planted early in the season while the second one was not planted until a month later. The first crop was entirely satisfactory; it was a normal crop. The second crop, however, was not a good one; in fact, it was not 50 per cent of a normal stand and yield. In the first crop at least half a dozen varieties of peas were used. Some varieties were, of course, earlier than others, so when the pigs were turned into the field, August 12, 1911, some of the beans were practically mature, some just beginning to ripen, some just forming peas, and others just blooming. If the crop had been planted with a view of being grazed by hogs the varieties of peas would not have been mixed. When the crop is to be grazed it is not advisable to mix varieties of peas which mature at different dates; in this case

the late maturing peas are almost all prevented from reaching maturity. It is wise, however, to plant different varieties of peas for grazing purposes, but they should be planted in separate fields and turned onto at different dates.

The first crop of peas was planted on a hillside in an orchard. The trees were young, however, and did not occupy much ground or interfere greatly with the pea crop. Each lot of hogs had the run of $1\frac{1}{4}$ acres while the first crop lasted and 1 acre when the second crop was employed. Each lot of 5 hogs, therefore, grazed $2\frac{1}{4}$ acres; if the peas had yielded a satisfactory crop of seed these areas would have afforded grazing for more than 5 animals.

In the financial statements the following prices were placed upon the feeds:—

Corn, per bushel	\$ 1.70
Shorts, per ton	36.00
Tankage, per ton	40.00
Cowpea pasture, per acre	8.00

THE HOGS.

The pigs were a fairly uniform lot of grade Duroc-Jerseys, Berkshires, and Poland-Chinas. At the beginning of the test, August 12, 1911, they averaged 53 pounds in weight. They were purchased of a farmer in Sumter County a few days before the inauguration of the experiment, and as they had been raised largely on pastures were in an exceedingly healthy condition.

DETAILS OF THE TEST.

As stated previously, the first crop of peas was ready to graze August 12, consequently the work was inaugurated upon that date. This crop afforded grazing until September 16; by this time the second crop was ready so the hogs were moved onto the second planting and grazed until November 5. The full grazing period was therefore 60 days.

TABLE 9.—*Cowpea Pastures for Grazing Hogs.*
(August 12—November 5)

Lot	RATION	Average daily gains	Feed to make 100 pounds of gain	Grain cost of 100 pounds of gain	Total cost of 100 pounds of gain
1	Corn $\frac{9}{10}$ ----- } dry lot----- Tankage $\frac{1}{10}$ ----- }	.54	Lbs. 486 corn--- 54 tankage	\$7.16	\$7.16
2	Corn $\frac{9}{10}$ ----- } $\frac{1}{2}$ ration----- Tankage $\frac{1}{10}$ ----- } Cowpea pasture-----	.97	143 corn--- 16 tankage .78 acre---	\$2.11	\$8.35
3	Corn $\frac{4}{5}$ ----- } $\frac{1}{2}$ ration----- Shorts $\frac{1}{5}$ ----- } Cowpea pasture-----	.94	150 corn--- 38 shorts--- .80 acre---	\$2.56	\$8.96
4	Corn— $\frac{1}{2}$ ration----- Cowpea pasture-----	.90	173 corn--- .83 acre---	\$2.16	\$8.80

The above gains were all made at an unusually heavy expense when corn is valued at 70 cents a bushel, tankage at \$40.00 a ton, shorts at \$36.00 a ton, and cowpea pastures at \$8.00 an acre. It is seen that the expense of making 100 pounds of increase in live weight was small when the concentrates alone were considered; this saving in grain was due to the pastures. However, when the expense of making the pastures was also taken into consideration the cost of making 100 pounds of increase in weight exceeded \$8.00 in every case. These high costs were due to the fact that each acre of cowpea pasture supplied a very small amount of feed; the pastures were, therefore, not used profitably by the hogs. In other words, when pastures were valued at \$8.00 an acre, pork was made more economically in the dry lot where only corn and tankage were fed. It is not known just how much cured hay these pastures would have made if they had not been grazed by the hogs; there is no doubt at all, however, that greater profits would have been secured from the areas if the cowpeas had been finally harvested as hay rather than grazed by hogs. The vines evidently made an exceedingly small yield of seed, thus affording the hogs a

small total amount of feed. As a matter of fact, the Station authorities have never been able to secure entirely satisfactory results from cowpea pastures when used as hog crops.

Compare Lots 1 and 2 and it is seen that .78 of an acre of cowpeas saved only 343 pounds of corn and 38 pounds of tankage; or, one acre of pastures was equal in feeding value to 7.9 bushels of corn and 49 pounds of tankage. When corn and tankage are valued as above indicated, one acre of cowpeas was worth only \$6.51 for feeding hogs. This is an exceedingly small feeding value when compared to the results which have been secured from certain other pasture crops.*

All the pigs in Lots 2, 3, and 4, had the run of cowpea pastures; they were given some concentrated feeds in addition to the pastures. It should be noted, however, that different supplementary feeds were employed. Many farmers are making inquiries as to whether corn is the best and cheapest supplementary feed, consequently this test was outlined to assist in answering these inquiries. It may be seen that the daily gains were slightly greatest in Lot 2 where both corn and tankage were used as supplementary feeds. It may be further seen that the most economical gains were also secured in Lot 2, each 100 pound of increase in live weight costing \$8.35; in Lot 4 where corn alone was fed as the supplement it cost \$8.80 to make the same amount of gains. Wheat shorts were not used to advantage in Lot 3.

Experiment B. Jackson School

The objects of this work were:—

- (a) To compare corn with rice polish as a feed for fattening pigs when each was supplemented with tankage in the proportion of nine parts of corn and rice polish to one of tankage.
- (b) To learn the value of a crop of corn and cowpeas when used as grazing crops for fattening pigs.

*See Alabama Station Bulletins 143 and 154.

THE PIGS.

Twelve pigs were purchased of farmers in the neighborhood of the Jackson District School. With one exception the pigs were scrubs, as good ones could not be obtained, and averaged 74 pounds in weight at the beginning of the test. As they had received rather careless treatment and a small amount of feed during the summer months they were thin when purchased by the Station and Jackson authorities; they were not, however, weakened in any way.

The animals were divided into three lots of four pigs each when the test began. The animals in Lot 1 were placed in a small pen (approximately 8 feet wide and 20 feet long); those in Lot 2 were enclosed in a pen similar to the first, while the pigs in Lot 3 were given the freedom of a corn and pea field, the peas being planted between the rows of corn.

THE FEEDS.

As stated before, the pigs were divided into three equal lots at the inauguration of the test; the lots were given the following rations;

Lot 1—Corn $\frac{9}{10}$,
Tankage $\frac{1}{10}$, } in dry lot.

Lot 2—Rice polish $\frac{9}{10}$,
Tankage $\frac{1}{10}$, } in dry lot.

Lot 3—Corn and pea field, with no additional grain.

The pigs in Lots 1 and 2 were fed twice a day, the feeds being mixed with water and made into a thin slop; the tankage was mixed with the corn meal and rice polish before adding the water. The pigs in Lot 3 were given nothing in addition to the corn and pea field.

The crop of corn on which the pigs of Lot 3 grazed was not good, yielding approximately 10 bushels of corn to each acre. The crop of cowpeas, however, which had been sown broadcast between the rows at the last cultivation of the corn, was a normal one. The Unknown variety of cowpeas was planted. September 19, when the hogs were turned into the field, the corn was ripe; on

this date the peas were in various stages of maturity, some being almost ripe while others were still in full bloom.

Some of the feed in this test cost more than the values placed upon them, but for the sake of uniformity and comparisons they were valued as follows:—

Corn, per bushel	\$.70
Tankage, per ton	40.00
Rice polish, per ton	26.00
Corn-and-pea pasture, per acre	10.00

DETAILS OF THE TEST.

As previously stated, the test was inaugurated September 19 and closed October 18, the corn-and-pea field being exhausted much more quickly than expected.

TABLE 10.—*Value of Corn-and-Pea Field when "Hogged" Off.*

(September 19—October 18)

Lot	RATION	Average daily gains	Feed to make 100 pounds of gain	Cost to make 100 lbs. of gain	Value of one acre
1	Corn $\frac{9}{10}$ ----- } Tankage $\frac{1}{10}$ ----- } in dry lot ---	.94	Lbs. 327 corn--- 36 tankage	\$4.81	---
2	Rice polish $\frac{9}{10}$ ----- } Tankage $\frac{1}{10}$ ----- } in dry lot ---	.90	330 polish-- 37 tankage	\$5.03	---
3	Corn-and-pea field----- (No grain)	1.08	.432 acre----	\$4.32	13.5 bu. corn plus 83 lbs. tankage.

The authors realize that the above test was not continued a sufficient number of days to secure entirely reliable information; nevertheless, two or three interesting points are brought out. Corn and rice polish, pound for pound, proved to be practically equal in feeding value. When comparing Lots 1 and 2 it is seen that 327 pounds of corn plus 36 pounds of tankage were required to make 100 pounds of increase in live weight, while 330 pounds of rice polish and 37 pounds of tankage produced the

same results. That is, a pound of corn is practically equal in feeding value to one pound of rice polish; this is in keeping with former work done at this Station. Very frequently the price of corn exceeds one dollar a bushel; when this occurs it will usually pay to feed rice polish as it can almost always be purchased for less than \$30.00 a ton. The following statements, based on the information in the above table, give the comparative values of corn and rice polish:—

When corn sells for 70 cents a bushel, rice polish is worth \$25.00 a ton.

When corn sells for 84 cents a bushel, rice polish is worth \$30.00 a ton.

When corn sells for 98 cents a bushel, rice polish is worth \$35.00 a ton.

When corn sells for \$1.12 a bushel, rice polish is worth \$40.00 a ton.

In Lot 3, where the corn-and-pea field was employed, .432 of an acre, at a cost of \$4.32, was required to produce 100 pounds of increase in live weight. It should also be noted that the pigs which grazed the corn-and-pea field made very rapid gains; the pigs in the other two lots also made satisfactory gains. When comparing the results in Lots 1 and 3 it is seen that .432 of an acre was equal, in feeding value, to 327 pounds of corn plus 36 pounds of tankage; or, when corn was valued at 70 cents a bushel and tankage at \$40.00 a ton, one acre of the corn-and-pea field was equal to 13.5 bushels of corn plus 83 pounds of tankage.

Some farmers have the impression that it is an exceedingly wasteful method to "hog" corn down. As a matter of fact, there is practically no loss of corn when the field is grazed by hogs, especially when small pigs and sows are turned in after the fattening hogs are removed. It is safe to say that hogs will not waste as much corn as will the careless harvester.

Experiment C. Albertville School

PLAN OF WORK.

In this test the fifteen hogs were divided into 3 equal lots and fed the following rations:—

Lot 1—Corn $\frac{2}{3}$,	}	in dry lot.
Wheat shorts $\frac{1}{3}$		
Lot 2—Corn $\frac{2}{3}$,	}	$\frac{1}{2}$ ration,
Wheat shorts, $\frac{1}{3}$		
Soy bean pasture.		
Lot 3—Corn $\frac{2}{3}$,	}	$\frac{1}{2}$ ration,
Wheat shorts $\frac{1}{3}$		
Cowpea pasture.		

The crops were ready for grazing September 25, so the experiment was inaugurated on that date. By November 1, the cowpea crop was exhausted, consequently this part of the test was closed after a grazing period of 37 days. These pigs were then transferred to the soy bean pasture on November 1 and fed with Lot 3 until December 12, when the soy bean pasture was also completely consumed, and the whole test brought to a close.

THE HOGS.

As satisfactory pigs could not be obtained in the vicinity of the Albertville School, they were purchased of a farmer near Opelika, Alabama and shipped to Albertville. The pigs were an unusually thrifty and well-bred lot of animals. None of them was pure-bred, but all carried a high percentage of either Duroc-Jersey or Poland China blood. They were approximately 4 months old at the beginning of the test and weighed, on the average, 62 pounds.

THE FEEDS.

The corn and shorts were mixed together, water poured upon them immediately before each feeding period, and the mixture given as a thin slop. The hogs were all fed twice a day.

The cowpea pasture was exceedingly poor, the stand being irregular and the beans and vines making an un-

satisfactory growth; this was partly due to late planting. When the hogs were turned into the field the majority of the peas (the seed) were ripe; in fact, better results would have been secured if the hogs had been given the freedom of the pasture two weeks earlier, as nearly all of the leaves had fallen before the test began. The five pigs grazed 1.9 acres of cowpeas in 37 days; this shows the crop to have been an exceedingly poor one.

The crop of soy beans was also very poor, as the stand was irregular and thin and the vines made a poor growth. The seed, however, developed satisfactorily. When the pigs were turned into the field the pods were nearly grown but not beginning to ripen; the lower leaves were just beginning to ripen and fall; the top leaves were perfectly green. Farmers sometime report that difficulty is experienced in inducing the hogs to eat the ripe bean. For some unknown reason the pigs in this test refused to eat the beans even after they had "popped" out onto the ground; they ate the leaves only. The authors have fed many hogs on soy bean pastures but never experienced this difficulty before. One acre of soy beans was planted; this afforded grazing for 5 pigs for 37 days when 4 new pigs were added to the lot and the 9 continued for 42 additional days.

The following prices were taken as a basis upon which to rest the financial estimates:

Corn, per bushel	\$.70
Wheat shorts, per ton	36.00
Soy bean pasture, per acre	8.00
Cowpea pasture, per acre	8.00

DETAILS OF THE TEST.

As previously stated, the test began September 25. The cowpea pasture afforded grazing only 37 days, or until November 1, when the hogs which had been grazing on the cowpea pasture were transferred to the soy bean lot. The soy bean pasture provided grazing until December 12, or a full period of 79 days. The feeding periods, therefore, were not equal in length so the results tabula-

ted for Lot 3 are not directly comparable with the results in Lots 1 and 2, but certain interesting general comparisons can be made.

TABLE 11.—*Soy Bean and Cowpea Pastures as Grazing Crops for Hogs.*
(September 25—December 12.)

Lot	RATION	Average daily gains	Feed to make 100 pounds of gain	Grain cost to make 100 pounds of gain	Total cost to make 100 pounds of gain
1	Corn $\frac{2}{3}$ ----- } Wheat shorts $\frac{1}{3}$ } in dry lot.	Lbs. .70	Lbs. 296 corn --- 148 shorts..	\$6.36	\$6.36
2	Corn $\frac{2}{3}$ ----- } Wheat shorts $\frac{1}{3}$ } $\frac{1}{2}$ ration-- Soy bean pasture-----	.83	248 corn --- 124 shorts-- .28 acre ---	\$5.33	\$7.57
3	Corn $\frac{2}{3}$ ----- } Wheat shorts $\frac{1}{3}$ } * $\frac{1}{2}$ ration-- Cowpea pasture-----	.95	114 corn --- 57 shorts-- 1.08 acre ---	\$2.45	\$11.09

On account of the fact that the pastures were both very poor unsatisfactory results were secured in Lots 2 and 3. If the hogs had eaten the beans in the soy bean lot (Lot 2) the results, in that lot, would have been fairly satisfactory and in keeping with other results secured at this Station.** While the cowpea pasture saved very much corn and shorts, at the same time a very large area of pasture was required to effect this saving of grain. The pasture was poor, as a result of which a large area was consumed, so the pasture part of the ration cost far more than the grain part. When pastures are good this condition of affairs is usually reversed.

Experiment D. Abbeville School

First Experiment.

(October 4—December 15.)

The cooperative work with the Abbeville School consisted of two separate experiments, the first of which

*The cowpea pasture lasted until November 4, a period of 37 days, so the results in Lot 3 are not directly comparable with those in Lots 1 and 2.

**See Alabama Station Bulletin 154.

covered the 72 days from October 4, 1911, to December 15, 1911, and the second the 50 days from January 11, 1912, to March 2, 1912. The results of the second test will be reported in a subsequent publication.

During the first test the hogs were divided into three lots and fed the following rations:—

Lot 1—Corn 9/10,	} in dry lot.
Tankage 1/10,	
Lot 2—Corn 9/10,	} ½ ration,
Tankage 1/10,	
Cowpea pasture.	
Lot 3—Corn 9/10,	} ½ ration,
Tankage 1/10,	
Velvet bean pasture.	

THE HOGS.

The pigs, fifteen in number, were fairly uniform in weight, quality and breeding. Two were grade Berkshires and the remaining 13 were grade and pure-bred Duroc-Jerseys. They were purchased of farmers living near Abbeville. At the beginning of the test, October 4, they averaged 62 pounds in weight and were approximately 4 months old.

THE FEED AND PASTURES.

The corn and tankage were mixed together before each meal and a sufficient amount of water poured on to make a rather thin slop; the mixture was then fed in long, flat troughs. Both the corn and tankage were fed in a fresh condition.

Owing to a continued drought the crop of cowpeas was poor. The vines made an unthrifty growth and the fruit developed unsatisfactorily. As the seed were sown broadcast the dry weather probably injured them more than if they had been sown in drills. The Iron variety was planted. When the test began the leaves had practically all turned yellow, but were still clinging to the vines. Altogether, the 5 hogs grazed 1.1 acres.

The velvet beans—1.9 acres in all—were planted in a corn field, one hill of beans being placed at each hill of

corn. The beans, of course, grew up and completely covered the corn, but when the corn became ripe it was gathered, and no feed, except the beans, was left in the field for the hogs. When the hogs were turned into the field the beans were in all stages of maturity, from just beginning to form the pods to almost ripe.

The following prices were placed upon the feeds:

Corn, per bushel	\$.70
Tankage, per ton	40.00
Cowpea pasture, per acre	8.00
Velvet bean pasture, per acre	8.00

DETAILS OF THE TEST.

The cowpea and velvet bean pastures were both ready to be grazed by October 4, consequently that date marked the beginning of the experiment. The 5 pigs consumed the 1.1 acres of cowpea pasture by November 7, so this lot of hogs was dropped out of the test; or, to be more exact, were transferred to the lot (Lot 3), where the velvet bean pasture was being grazed, and continued with this third lot. The velvet bean pasture afforded grazing until December 15, a period of 72 days. Because of the fact that the pigs in Lot 2 were fed a period of only 34 days and those in Lots 1 and 3 for 72 days, the results secured in Lot 2 are not directly comparable with those tabulated in the other two lots.

TABLE 12.—*Cowpea and Velvet Bean Pastures as Grazing Crops for Hogs.*

(October 4—December 15.)

Lot	RATION	Average daily gains	Feed to make 100 pounds of gain	Grain cost to make 100 pounds of gain	Total cost to make 100 pounds of gain
		Lbs.	Lbs.		
1	Corn $\frac{9}{10}$ ----- } Tankage $\frac{1}{10}$ ----- } in dry lot---	.84	360 corn--- 40 tankage	\$5.30	\$5.30
2	Corn $\frac{9}{10}$ ----- } Tankage $\frac{1}{10}$ ----- } $\frac{1}{2}$ ration---- Cowpea pasture-----	.76	187 corn--- 21 tankage .85 acre ---	\$2.76	\$9.56
3	Corn $\frac{9}{10}$ ----- } Tankage $\frac{1}{10}$ ----- } $\frac{1}{2}$ ration---- Velvet bean pasture-----	1.23	153 corn--- 17 tankage .38 acre ---	\$2.25	\$5.29

The cowpea pasture proved to be of very little value; this was perhaps largely due to a poor stand and yield. The pea pasture saved large amounts of corn and tankage but a large area was required to effect the saving; when the cost of grain alone is considered it cost only \$2.76 to make 100 pounds of increase in live weight, but when the expenses of the pasture, at \$8.00 an acre, is added to this the total cost to produce an increase in weight of 100 pounds is raised to \$9.56.

On the other hand, the velvet bean pasture gave satisfactory results; it should be recalled that a crop of corn was gathered from this area before the hogs were turned on. By comparing Lots 1 and 3 it may be seen that .38 of an acre of velvet beans saved 207 pounds of corn plus 33 pounds of tankage; or, one acre of the beans was equal, in feeding value, to 9.8 bushels of corn and 87 pounds of tankage. When corn is valued at 70 cents a bushel and tankage at \$40.00 a ton each acre of velvet beans proved to have a feeding value of \$8.60; this value was, in fact, added to an average and normal crop of corn as the corn and beans were grown on the same area.

SUMMARY STATEMENTS.

EXPERIMENT A.

1. The 20 pigs used in this test were divided into 4 equal lots and given the following feeds:

- | | |
|-----------------------------------|-------------------------|
| Lot 1—Corn $\frac{9}{10}$. | } in dry lot. |
| Tankage $\frac{1}{10}$ | |
| Lot 2—Corn $\frac{9}{10}$. | } $\frac{1}{2}$ ration. |
| Tankage $\frac{1}{10}$ | |
| Cowpea pasture. | |
| Lot 3—Corn $\frac{4}{5}$. | } $\frac{1}{2}$ ration. |
| Wheat shorts $\frac{1}{5}$ | |
| Cowpea pasture. | |
| Lot 4—Corn— $\frac{1}{2}$ ration. | |
| Cowpea pasture. | |

2. Two crops of cowpeas were planted, one early in the season and one late. The first crop was normal; the second one was about 50 per cent of a normal stand and yield. The test was inaugurated August 12 and continued until November 5—a grazing period of 60 days.

3. The pigs, which averaged 53 pounds in weight at

the beginning of the test, made average daily gains of .54 of a pound, .97 of a pound, .94 of a pound, and .90 of a pound in Lots 1, 2, 3, and 4, respectively.

4. To make 100 pounds of increase in live weight required 486 pounds of corn plus 54 pounds of tankage in Lot 1, 143 pounds of corn plus 16 pounds of tankage plus .78 of an acre of cowpeas in Lot 2, 150 pounds of corn plus 38 pounds of shorts plus .80 of an acre of cowpeas in Lot 3; and 173 pounds of corn plus .83 of an acre of cowpeas in Lot 4.

5. When the cost of the grain alone was charged against the gains it cost \$7.16, \$2.11, \$2.56, and \$2.16 to make each 100 pounds of increase in live weight in Lots 1, 2, 3, and 4, respectively. But large areas of cowpeas pastures were required to assist in making the gains. When the expenses of making the pastures are taken into consideration, the cost of making each 100 pounds of increase in weight was raised to \$7.16, \$8.35, \$8.96, and \$8.80 in lots 1, 2, 3, and 4, respectively.

6. The cowpeas pastures were not used profitably in fattening these hogs; this was due to the fact that the pastures afforded a small amount of feed. In fact, the authorities of this Station have never been able to secure satisfactory results from cow pea pastures when grazed by hogs.

EXPERIMENT B.

1. The 12 pigs used in this test were divided into three equal lots and fed the following feeds:

Lot 1—Corn $9/10$.
Tankage $1/10$ } in dry lot.

Lot 2—Rice polish $9/10$ }
Tankage $1/10$ } in dry lot.

Lot 3—Corn and pea field.

2. The pigs, which averaged 74 pounds in weight at the beginning of the test, made average gains of .94 of a pound, .90 of a pound, and 1.08 pounds in Lots 1, 2, and 3, respectively. The test was a short one, however, so too much reliance should not be placed in the results; the experiment continued from September 19 to October 18.

3. To make 100 pounds of increase in live weight required 327 pounds of corn plus 36 pounds of tankage in Lot 1; 330 pounds of rice polish plus 37 pounds of tankage in Lot 2; and .432 of an acre of corn and pea field in Lot 3 ("hogged" off).

4. It cost \$4.81, \$5.03, and \$4.32 to make 100 pounds of increase in weight in Lots 1, 2, and 3, respectively,

when corn was valued at 70 a bushel, tankage at \$40.00 a ton, rice polish at \$26.00 a ton, and the corn and pea field at \$10.00 an acre.

5. The rice polish and corn, pound for pound, proved to be practically equal in feeding value. Corn, however, at 70 cents a bushel, was a cheaper feed than rice polish at \$26.00 a ton. 70 cent corn is equal to \$25.00 rice polish.

EXPERIMENT C.

1. The 15 pigs used in this experiment were divided into three equal lots and given the following feeds:

Lot 1—Corn $\frac{2}{3}$.	} in dry lots.
Wheat shorts $\frac{1}{3}$.	
Lot 2—Corn $\frac{2}{3}$.	} $\frac{1}{2}$ ration.
Wheat shorts $\frac{1}{3}$.	
Soy bean pasture.	
Lot 3—Corn $\frac{2}{3}$.	} $\frac{1}{2}$ ration.
Wheat shorts $\frac{1}{3}$.	
Cowpea pasture.	

2. The crops of cowpeas and soy beans were both unsatisfactory, as the stands were irregular and the growth stunted. September 25 the crops were ready to be grazed. By November 4 the crop of cowpeas was exhausted, so the pigs in this lot were transferred to the soy bean lot and continued with that lot until December 12.

3. The pigs, which averaged 62 pounds in weight at the beginning of the test, made average daily gains of .7 of a pound and .83 of a pound in Lots 1 and 2, respectively. The pigs in Lot 3 were fed on cowpea pasture only 37 days and during this short period made an average daily gain of .95 of a pound.

4. To make 100 pounds of increase in live weight required 296 pounds of corn plus 148 pounds of wheat shorts in Lot 1, and 248 pounds of corn plus 124 pounds of wheat shorts plus .28 of an acre of soy bean pasture in Lot 2. During the 37 days while the pigs in Lot 3 were on the cowpea pasture each 100 pounds of increase in live weight required the use of 114 pounds of corn plus 57 pounds of wheat shorts plus 1.08 acres of pasture.

5. This test again illustrates the point that economical gains cannot be made with poor and unsatisfactory pastures. When the expenses of the grains and pas-

tures are all charged against the gains, it cost \$6.36 and \$7.57 to make 100 pounds increase in weight in Lots 1 and 2, respectively. In lot 3 the gains cost \$11.09 per hundred during the short period of 37 days. The pastures saved large amounts of grains, but large areas of these poor pastures were used in effecting the saving of grain.

EXPERIMENT D.

1. The 15 pigs used in this test were divided into 3 equal lots and given the following feeds:

Lot 1—Corn $\frac{9}{10}$.
Tankage $\frac{1}{10}$ } in dry lot.

Lot 2—Corn $\frac{9}{10}$.
Tankage $\frac{1}{10}$ } $\frac{1}{2}$ ration.
Cowpea pasture.

Lot 3—Corn $\frac{9}{10}$.
Tankage $\frac{1}{10}$ } $\frac{1}{2}$ ration.
Velvet bean pasture.

2. The crop of cowpeas, like those reported above, was poor; the vines made an unthrifty growth and the fruit developed unsatisfactorily. The crop of velvet beans, however, was fairly satisfactory. 5 pigs grazed the 1.1 acres of cowpea pasture from October 4 to November 7, when the crop was exhausted. The velvet bean crop, however, afforded grazing much longer, so the 5 pigs in the cowpeas lot were transferred to the bean lot on November 7 and continued with the 5 pigs in the bean lot until December 15.

4. To make 100 pounds of increase in live weight required 360 pounds of corn plus 40 pounds of tankage in Lot 1, and 153 pounds of corn plus 17 pounds of tankage plus .38 of an acre of velvet bean pasture in Lot 3.

5. The pastures both saved large amounts of grain, but rather large areas of pasture, especially in Lot 2, were required to effect this saving. When corn was valued at 70 cents a bushel, tankage at \$40.00 a ton, and pastures at \$8.00 an acre, it cost \$5.30 and \$5.29 to make 100 pounds of increase in weight in Lots 1 and 3. In Lot 2, where cowpea pasture was employed for a short period of 35 days, it cost \$9.56 to make 100 pounds increase in weight.

6. The velvet bean crop proved to be entirely satisfactory. It should be remembered that a normal crop of corn was gathered from this area before the hogs were turned in.

PART IV

Fattening Hogs on Corn, Corn Plus Wheat Shorts, and Corn Plus Skim Milk

INTRODUCTION.

It is, of course, practically impossible to profitably raise and finish hogs for the market without the use of both permanent and temporary pasture crops. Good permanent pastures save at least 50 per cent of the grain, and, at the same time, entail practically no expense after once being established. Temporary pasture crops, which must be prepared yearly or semi-yearly, vary very much in their worth as hog crops. Parts of this bulletin show that a poor temporary crop is a more expensive feed than some of the high-priced grains. On the other hand, good temporary crops afford the hog feeder the cheapest possible feed. But many Alabama farmers do not at present possess good, or any kind, of permanent and temporary crop. When this condition obtains it becomes absolutely necessary to feed and fatten the hogs on hand in a dry lot and on high-priced concentrated feeds. As some feeds are entirely unsuited for feeding hogs, either alone or in combination, and as some feeds are very much more valuable than others, it is of very great importance for the feeder to have accurate information relative to the common hog feeds, especially when the high-priced concentrates are being employed.

FEEDS AND FEEDING.

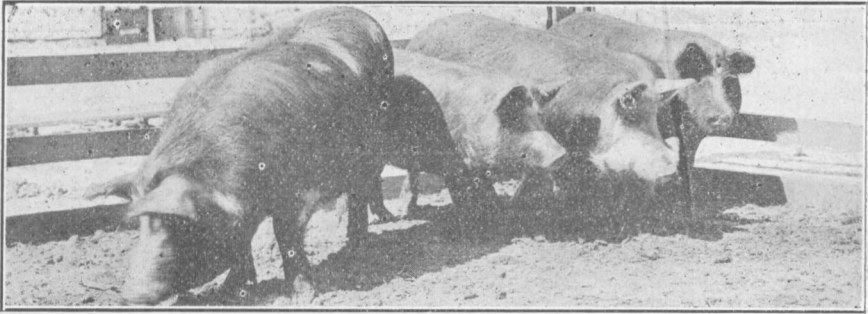
Three separate tests with the above feeds and combination of feed were performed in as many years. Each year the 15 pigs were divided into three lots, as nearly equal in weight, breeding, and quality as possible, and fed the following feeds:—

Lot 1—Corn alone.

Lot 2—Corn $\frac{2}{3}$,
Wheat shorts $\frac{1}{3}$

Lot 3—Corn, 1 part,
Skim milk, 2.2 parts.

A part of the corn was grown on the Station Farm and a part purchased of a local merchant. It was all fresh and bright. The wheat shorts was purchased of a mill



LOT 1. First experiment. Picture taken at end of test. These hogs were fed on corn alone from November 17 to March 27, and during this time gained at an average daily rate of only .42 of a pound. The pigs in Lot 3 which were fed on corn and skim milk gained practically three times as rapidly. It cost \$11.14 to make 100 pounds of increase in live weight on these corn-fed hogs.

in Tennessee and each sack carried a guaranteed analysis of 16.14 per cent protein, 4.55 per cent fat, 7.36 per cent fibre, and 56.36 per cent carbohydrates; the shorts was, therefore, of a high quality. The skim milk was made on the Station Farm and fed immediately after coming from the separator; the milk was always sweet.

The hogs were fed twice each day, once early in the morning (the hour varied with the time of year) and meal after being mixed with sufficient water to make a thin slop. In the second lot the wheat shorts and the corn were mixed together, previous to the introduction of the water, and the slop poured into a long trough. The skim milk in Lot 3 was always fed by itself and after the corn part of the ration was entirely consumed.

In the financial statements the following prices were used as a basis:—

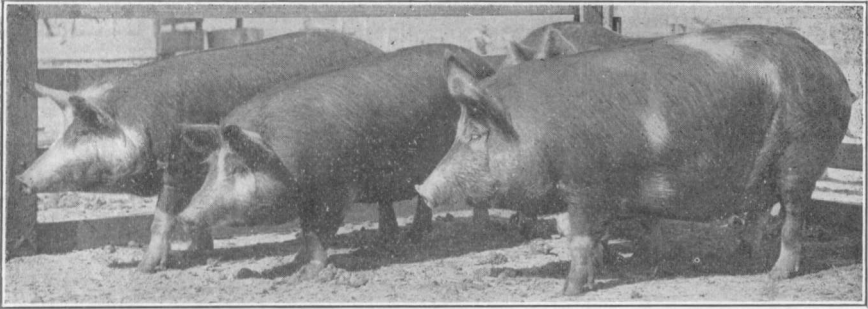
Corn, per bushel	\$.70
Wheat shorts, per ton	36.00
Skim milk, per cwt.30

Water and a dry mixture of charcoal, lime, and salt were kept before the animals all the time.

SHEDS, LOTS.

Two of these months; during from the cold rain floor, which extended to the lots. The lots were made during the winter

months the hogs were protected from the winds by a shed, with a cement floor across the east ends of the open lots, 10 feet wide and 80 feet long. One lot was made during the warm summer



LOT 2. First experiment. Picture taken at end of test. These hogs were fed on corn and wheat shorts from November 17 to March 27, and during this time gained at the average rate of .97 of a pound daily. It cost \$8.00 to make 100 pounds of gain, when corn is valued at 70 cents a bushel and shorts at \$36.00 a ton.

months; during these months the hogs were protected from the hot sun by shade trees which stood in the lots. The hogs were made comfortable all the time.

THE HOGS.

The animals were all purchased of neighboring farmers. None of them was pure bred, but all carried some improved Berkshire, Poland-China, or Duroc-Jersey blood. As they had practically all been raised under pasture and range conditions they were thrifty when the Station authorities got possession of them. Although they varied very little in breeding and general quality from year to year, the weights varied some. In 1911-12 the pigs averaged, at the inauguration of the test, 80 pounds in weight, the summer of 1912, they averaged 48 pounds in weight, and the fall and winter of 1912, they had attained an average initial weight of 55 pounds.

DETAILS OF THE EXPERIMENT.

The first test continued from November 17, 1911 to March 27, 1912, a period of 130 days. The second test was inaugurated June 4, 1912 and closed October 12, 1912, a period of 134 days. The third experiment began before the second one closed; it began September 21, 1912 and closed December 4, 1912, a period of 82 days. The following table gives the most important data of the work.

TABLE 13.—*Corn Alone, Corn Plus Wheat Shorts, and Corn Plus Skim Milk, For Fattening Hogs.*1911-12
(November 17, 1911—March 27, 1912)

Lot	No. of pigs	RATION	Average Initial wt. of each pig	Average daily gains	Feed to make 100 pounds of gain	Cost to make 100 pounds of gain
1	5	Corn alone.....	Lbs. 80	Lbs. .42	Lbs. 891.....	\$11.14
2	5	Corn $\frac{2}{3}$ Wheat shorts $\frac{1}{3}$	81	.97	372 corn..... 186 shorts.....	8.00
3	5	Corn, 1 part..... Skim milk, 2.2 parts	78	1.29	354 corn..... 780 milk.....	6.77

Summer of 1912.
(June 1, 1912-October 12, 1912)

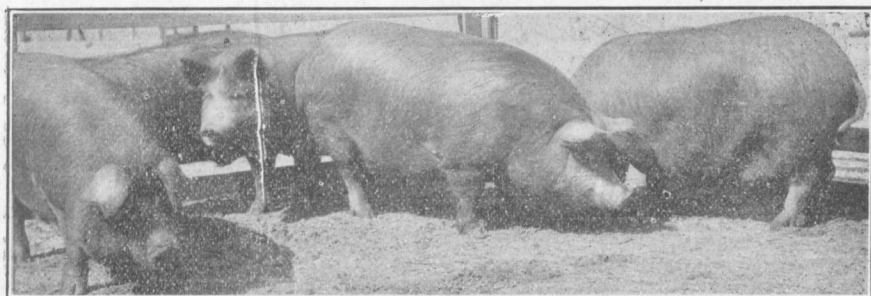
1	5	Corn alone.....	50	.49	604.....	\$7.55
2	5	Corn $\frac{2}{3}$ Wheat shorts $\frac{1}{3}$	47	.68	338 corn..... 169 shorts.....	7.27
3	5	Corn, 1 part..... Skim milk, 2.2 part	46	1.29	278 corn..... 635 milk.....	5.38

Fall of 1912.
(September 21-December 11)

1	5	Corn alone.....	63	.28	745.....	\$9.31
2	5	Corn $\frac{2}{3}$ Wheat shorts $\frac{1}{3}$	49	.86	308 corn..... 154 shorts.....	6.62
3	5	Corn, 1 part..... Skim milk, 2.2 part	53	1.41	256 corn..... 582 milk.....	.495

In a general statement it may be said that it always paid to supplement the corn with wheat shorts and skim milk, the skim milk proving to be the best and cheapest supplement. Throughout all of the above tests the hogs which were fed on corn made exceedingly unsatisfactory gains. Those which were fed on both corn and shorts always made satisfactory gains in weight, and those which drank skim milk as a supplement gave almost remarkable results when compared with the results obtained when corn alone was employed.

In 1911-12, the pigs averaged approximately 80 pounds in weight at the beginning of the test. The pigs in Lot 1, the corn-fed lot, made an average daily gain of only .42 of a pound; in fact, some of the pigs in this



LOT 3. First experiment. Picture taken at end of experiment. These hogs were fed on corn and skim milk from November 17 to March 17, and during this period gained 1.29 pounds daily. It cost \$6.77 to make 100 pounds of gain when corn is valued at 70 cents a bushel and skim milk at 30 cents a hundred. In Lot 1, where corn alone was fed, it cost \$11.14 to make 100 pounds of gain.

lot made practically no gains at all and were not in suitable killing condition at the end of the test. The pigs in Lot 2, the corn-and-shorts lot, made satisfactory gains as they averaged .97 of a pound daily. For the size of the pigs at the beginning, those which were fed corn and skim milk (Lot 3) made exceedingly good gains; these pigs made an average daily gain of 1.29 pounds. In the summer of 1912, when the second test was made, the gains were very similar to those obtained during the first experiment. The corn-fed animals (Lot 1) gained at an average rate of .49 of a pound daily; some of these pigs were not fit for slaughter at the end of the experiment. The pigs which were fed both corn and wheat shorts (Lot 2) gained, on the average, .68 of a pound daily; this was not completely satisfactory, but all of the individuals were in good condition for sale at the end. The lot which was fed on corn and skim milk again made unusually good gains; these pigs averaged 1.29 pounds daily. In the third test, during the fall of 1912, and different feeds produced widely different daily gains. The corn-fed hogs (Lot 1) this year made such unsatisfactory gains—making only .28 of a pound daily—that not a one in the lot was ready to be slaughtered at the close of the experiment. The animals in Lots 2 and 3 made average daily gains .86 of a pound and 1.41 pounds respectively.

The feed required to produce 100 pounds of increase in live weight varied fully as much as did the daily gains. In 1911-12 the lot of hogs (Lot 1) which ate corn alone consumed 891 pounds of corn for each 100 pounds of increase in weight. Where both corn and shorts were fed (Lot 2) only 372 pounds of corn plus 186

pounds of shorts were required to make an equal amount of increase in weight. That is, the 186 pounds of wheat shorts saved 519 pounds of corn; at this rate, 1 ton of wheat shorts took the place of, or saved, 5581 pounds of corn, worth \$69.76 when corn is valued at 70 cents a bushel. The wheat shorts cost only \$36.00 a ton. In Lot 3, where corn and skim milk were used, there were required to make 100 pounds of increase in live weight 354 pounds of corn plus 780 pounds of skim milk. The 780 pounds of skim milk, therefore, saved 537 pounds of corn (compare Lots 1 and 3.) At this rate 100 pounds of skim milk effected the saving of 69 pounds of corn, worth 86 cents when corn is valued as above. In the second test, during the summer of 1912, where corn was fed alone 604 pounds were consumed for each 100 pounds of increase in weight, but in Lot 2, where both corn and wheat shorts were employed, only 338 pounds of corn plus 169 pounds of shorts saved 266 pounds of corn; or, 1 ton of shorts saved 3147 pounds of corn; this amount of corn, when valued as above, is worth \$39.34. In Lot 3, where corn and skim milk were fed, only 278 pounds of corn plus 635 pounds of milk were required to make 100 pounds of gain. The 635 pounds of milk, therefore, saved 326 pounds of corn; or, 100 pounds of skim milk saved, or took the place of, 51 pounds of corn; this amount of corn is worth 64 cents. The skim milk, which was valued at only 30 cents per hundred weight, was actually worth 64 cents per hundred weight in terms of corn saved. In the third test, during the fall of 1912, 745 pounds of corn (Lot 1) were required to make 100 pounds increase in weight, but in Lot 2, where both corn and shorts were fed, only 308 pounds of corn plus 154 pounds of shorts were required to make an equal amount of gain. 154 pounds of shorts therefore saved 437 pounds of corn, or, at this rate, 1 ton of shorts actually saved 5675 pounds of corn, which amount, at 70 cents a bushel, is worth \$70.94. In Lot 3 only 256 pounds of corn plus 582 pounds of skim milk were required to make 100 pounds of pork. The 582 pounds of milk therefore saved 489 pounds of corn, or, 100 pounds of milk took the place of 84 pounds of corn; this amount of corn is worth \$1.05 when valued at 70 cents a bushel.

The last column in the above table shows the cost to make 100 pounds of increase in weight, when corn is valued at 70 cents a bushel, wheat shorts at \$36.00 a ton, and skim milk at 30 cents a hundred weight. Money was lost in every case where corn was fed alone; that is, the corn did not sell, through the hogs, for as much

as it would have brought on the corn market. When hogs sell for 7 cents a pound live weight the corn which the hogs ate in Lot 1 during the first test sold through them for only 44 cents a bushel; that in the second test for 65 cents a bushel; that in the third test for 53 cents a bushel. In every case where corn and wheat shorts were fed together better financial results were secured, although in this case it cost as high as \$8.00 in one instance to make 100 pounds of increase in weight. Nevertheless, the corn, which was eaten in conjunction with shorts, sold for very much better prices through the hogs, for 55 cents a bushel when hogs were valued at 7 cents a pound and wheat shorts at \$36.00 a ton, the second year for 66 cents a bushel, and the third year for 59 cents a bushel. At present prices of hogs, money was made in every case when corn and skim milk were fed together. When hogs sell for 7 cents a pound live weight, the corn which the hogs ate in Lot 3 during the first test sold through them for 74 cents a bushel; that in the second test for \$1.03 a bushel; that in the third test for \$1.15 a bushel.

SUMMARY STATEMENTS.

1. In Part IV of this bulletin is reported a summary of three separate tests in which 45 hogs were used. The 15 hogs of each year were divided into three equal lots and fed the following feeds:—

Lot 1—Corn alone.

Lot 2—Corn $\frac{2}{3}$,
Wheat shorts $\frac{1}{3}$.

Lot 3—Corn, 1 part
Skim milk, 2.2 parts.

2. The corn-fed pigs made very unsatisfactory gains; the pigs in these lots gained daily only .42 of a pound, .49 of a pound, and .28 of a pound in the first, second, and third experiments, respectively. The pigs which ate both corn and wheat shorts made satisfactory gains; these pigs made average daily gains of .97 of a pound, .68 of a pound, and .86 of a pound in the first, second, and third tests, respectively. The animals which were fed corn and skim milk made unusually rapid gains; they gained at the average rate of 1.29 pounds, 1.29 pounds, and 1.41 pounds in the first, second and third tests respectively.

3. The corn-fed hogs were fed at a loss in every case. At present prices of hogs, those which were fed on both corn and shorts just about came out even. The pigs which were fed on corn and skim milk returned profits in every case.