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In this issue . . .

On the cover. Members of the Alabama Soil Fertility Society and farmers are shown when they visited the Brewton Experiment Field. Included in their study of the work of the Field were the plots in the experiment to determine what yields would result in a period of years from use of all known good production practices except irrigation. The experiment at the Brewton Field is one at seven locations reported in the article on page 8. Eight-year averages at this Field were: cotton 1.7 bales, corn 103 bu., and soybeans 30 bu.

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Auburn, Alabama

New and Timely PUBLICATIONS

Listed here are timely and new publications reporting research by the Agricultural Experiment Station.

Bul. 344. Effects of Deep Turning and Non-Dirting Cultivation on Bunch and Runner Peanuts.

Bul. 346. Effect of Seed Size on Vigor and Yield of Runner Peanuts.

Bul. 347. Coastal Bermuda Pastures Compared with Other Forages for Dairy Cows.

Bul. 348. Relationships of Marketing Methods to Costs of Assembling, Grading, and Packaging Table Eggs.

Bul. 349. Production and Marketing of Corn in Northern Alabama.

Cir. 145. Production of Christmas Trees in Eastern Redcedar and Arizona Cypress Plantations.

Leaf. 69. Performance of Peach Varieties in Alabama.

Prog. Rept. 84. Rainfall Distribution in Alabama.

Free copies may be obtained from your County Agent or by writing the Auburn University Agricultural Experiment Station, Auburn, Alabama.

NITROGEN—PROFITABLE for JOHNSONGRASS

C. E. SCARSBROOK, *Department of Agronomy and Soils*
L. A. SMITH and H. W. GRIMES, *Black Belt Substation*

JOHNSONGRASS PRODUCES large amounts of good quality forage when moisture and fertility are adequate. Average production of 4.7 tons of hay per acre was recorded during 4-year tests at the Black Belt Substation when annual nitrogen rate was 80 lb. of N per acre.

Data in the table are from the 4-year experiment on Sumter clay soil at the Black Belt Substation. The experimental area was an established johnsongrass stand that had previously been utilized for hay and temporary grazing. The field had been adequately fertilized for several years before the test. The established stand was overseeded to assure uniformity of stand required for small plot experiments.

Cutting was done when the largest plants were in the early bloom stage. At this maturity, plants in the highest yielding treatments usually contained about 18% dry matter and the lowest producing, less succulent plants 22% dry matter. Content of dry matter went as high as 28% when harvesting was done during drought periods.

Nitrogen Increases Yield

The results show an increase in yield of johnsongrass as N was increased up to 320 lb. per acre. Soil moisture was satisfactory to excellent during every year of the study.

In another experiment annual yield was only 2.8 tons with 320 lb. of nitrogen added. Only two cuttings were obtained during this exceptionally dry year, although johnsongrass usually produces four cuttings per year.

When johnsongrass is grown in rotation with Caley peas, much of the nitrogen requirement is met by the legume. Caley peas, even if removed for hay, fix an excess of N that can be utilized by the grass. Accordingly, when johnsongrass is grown in rotation with Caley peas, 40 lb. of N added after the first cutting should produce satisfactory yields.

Phosphate, Potash Important

Striking response of johnsongrass to nitrogen makes it easy to overlook the importance of phosphate and potash fertilizers. Value of these elements was shown by comparison of results when 160-lb. N rate was used without phosphate and potash and when 240 lb. each of phosphate and potash were used in addition to N. When only N was applied, yields declined after the first year. At the end of 4 years the yield was only 60% of first year production. The poor yields were principally the result of stand depletion. Stand on plots receiving no phosphate and potash was reduced by about 50% in 4 years.

Tremendous response of johnsongrass to nitrogen is illustrated here. That at left got ample N, whereas plot at right got none.

Crude protein content of johnsongrass forage varied widely with season and with nitrogen applications. Where no nitrogen was applied it went from as low as 7.5% to as high as 10.6%. These percentages were increased slightly by applying 80 lb. of N per acre. When the 320-lb. rate was used, the range of crude protein was 9.4% to 15.6%.

Caley Peas High in Protein

The Caley peas were high in crude protein, with a range of 18.8% to 29.1%. Factors other than nitrogen rate also affect the protein content of plants. For example, as plants mature, protein content tends to decrease.

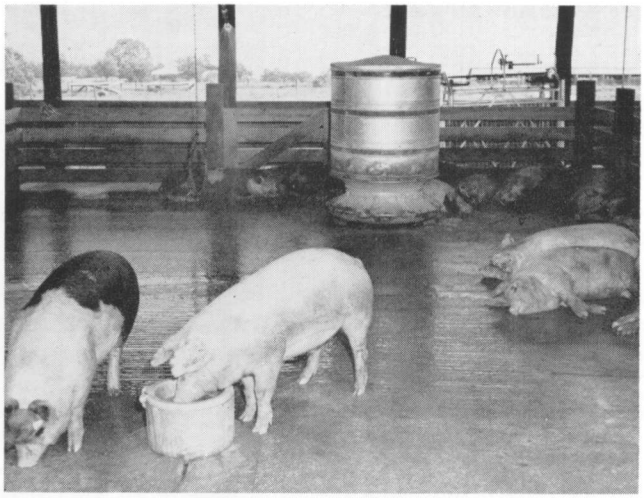
From results of this and other studies, it is recommended that 40 lb. of nitrogen be applied after every cutting of pure johnsongrass stands, except the last. Total amount used should not exceed 120 lb. per acre per year. While higher rates will increase yield, they are not profitable. Yields of 4 to 5 tons per acre have been made with 120-lb. rates of N on pure grass stands or with 40 lb. of N where Caley peas were overseeded on johnsongrass.

FORAGE PRODUCTION OF JOHNSONGRASS ALONE AND IN COMBINATION WITH CALEY PEAS, BLACK BELT SUBSTATION, 1958-61

Nitrogen rate, per acre	Dry forage yield, tons per acre				
	1958	1959	1960	1961	Av.
Johnsongrass alone					
No nitrogen	4.4	3.4	2.5	2.4	3.2
40 lb. N	5.2	3.9	3.3	3.0	3.8
80 lb. N	5.6	4.7	4.1	4.3	4.7
320 lb. N	6.9	6.5	6.8	6.5	6.7
Johnsongrass + Caley peas					
No nitrogen	5.7	3.8	4.3	4.4	4.5
40 lb. N	5.4	4.3	4.9	5.7	5.1

Does it pay to LIMIT-FEED GROWING-FINISHING HOGS?

HOWARD TUCKER
Department of Animal Science



Restricting feed for growing-finishing hogs showed little improvement in carcass composition, reduced rate of gain, and improved feed efficiency only slightly.

RESTRICTING FEED intake of growing-finishing hogs improved feed efficiency only slightly, showed little improvement in carcass composition, and reduced the rate of gain in tests conducted at the Auburn University Agricultural Experiment Station.

Feeding was done on concrete-floored pens. Full-fed groups were fed in self-feeders carefully adjusted to minimize feed wastage. Feed allowances for the limited-fed groups were calculated and adjusted weekly by a formula based on the weight and feed consumption of the full-fed group.

Rates of Feeding

Two tests were conducted using groups full-fed, 90%, and 80% of full feed. In the first test all groups received the same quantity of supplement. Corn was the only ingredient varied. Calculated protein contents received by the three groups were 16%, 17.6%, and 19.2%, respectively. In the second test a 16% protein ration was fed throughout the test to all ration levels.

Response

The 80% full-fed group gained much slower than the full-fed and 90% groups. This limited group required 17-20 days longer to reach market. Feed efficiencies were slightly better for the two limited-fed groups. Carcass quality improved slightly as feed levels decreased.

In the second test there was a definite reduction in growth as the level of feeding was decreased. Pigs fed free-choice reached the market an average of 18 and 27 days earlier than the 90% and 80% fed groups, respectively. Feed efficiencies for the full-fed and 90% groups were similar. The 80% group was about 4% more efficient than the other two groups. Carcass qualities were similar among all groups.

TABLE 1. RESULTS OF LIMITED FEEDING WITH EQUAL PROTEIN QUANTITY FOR EACH INCREMENT OF FEEDING LEVEL

Treatment	Performance						Carcass composition			
	An.	Initial wt.	Final wt.	A.D.G.	To market	Feed per lb. gain	Backfat	Dressing	Lean cuts	Fat trim
	No.	*Lb.*	*Lb.*	*Lb.*	*Days*	*Lb.*	*In.*	*%*	*%*	*%*
Full-fed	8	46	205	1.59	100	3.32	1.56	73.1	52.2	23.4
90% full-fed	7	45	205	1.56	103	3.16	1.46	72.3	53.0	21.4
80% full-fed	8	46	205	1.32	120	3.20	1.37	71.9	55.4	19.9

Results

Test results show that a restriction of feed decreased rates of gain. Thus, facilities, labor, and capital are tied-up for longer periods of time. The small amount of feed saved by limited feeding will not compensate for the longer period required to reach market. The small differences in feed requirements in these tests probably resulted from wastage by full-fed groups. The often reported advantage for limited feeding may be in reality a result of excessive feed wastage by full-fed hogs.

There was a difference in carcass composition between the two tests. In the first test, when the quantity of protein supplement was the same, carcass quality was improved by feed restriction. However, carcass compositions were similar in all treatments with the 16% protein in the second test.

When all factors of performance and carcass composition are evaluated, limited feeding showed no consistent advantage over full feeding.

TABLE 2. RESULTS OF LIMITED FEEDING WITH A 16 PER CENT PROTEIN RATION

Treatment	Performance						Carcass composition			
	An.	Initial wt.	Final wt.	A.D.G.	To market	Feed per lb. gain	Backfat	Dressing	Lean cuts	Fat trim
	No.	*Lb.*	*Lb.*	*Lb.*	*Days*	*Lb.*	*In.*	*%*	*%*	*%*
Full-fed	7	43	201	1.67	95	3.16	1.52	71.3	53.9	21.5
90% full-fed	8	42	204	1.47	113	3.20	1.34	71.7	55.0	20.3
80% full-fed	7	42	203	1.32	122	3.07	1.52	71.7	55.0	21.1

MECHANICAL HARVESTING of IRRIGATED COTTON

Interaction of spacing and variety caused these differences in harvesting efficiency from extreme treatments in 1961: Left —DPSL variety with 8,000 plants per acre made 975 lb. per acre total lint yield but only 849 lb. harvested yield; right —Empire, 80,000 plants per acre, had harvested yield of 943 lb. out of total yield of 975 lb.

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LARGE PLANTS and dense foliage are normal characteristics of irrigated cotton. These growth habits often complicate insect control, defoliation, and mechanical harvesting in many areas of Alabama.

Studies were begun in 1959 at the Tennessee Valley Substation to learn about machinery problems associated with mechanized production and harvesting of furrow-irrigated cotton. One part of the project deals with evaluation of mechanical picker performance in relation to plant characteristics that are influenced by spacing and variety.

Test plots were planted on a field of Decatur clay that was prepared for furrow irrigation during fall 1958. The field had fairly even topography and required only minor surface corrections to obtain a layout of 800-ft. rows with a slope of about 0.3%.

* Cooperative USDA, ARS, AERD.

Treatment comparisons were: five plant populations – 8,000, 20,000, 40,000, 80,000, and 120,000 plants per acre; three varieties – Empire, Deltapine Smooth Leaf, and Auburn 56; and two irrigation levels – 1-in. and 2-in. applications. All possible combinations of variety and spacing were used with each irrigation level. Five irrigations at each level were made in 1960 and three in 1961.

All plots were drilled thick and hand-thinned to the desired stand. Fertilization, based on soil test, amounted to 110 lb. of N, 115 lb. of P_2O_5, and 145 lb. of K_2O per acre.

Two harvestings were made each year with an International Harvester one-row, high drum picker. Picking dates were October 11 and 24 in 1960 and October 19 and November 1 in 1961.

Harvesting results were similar from year to year and there were practically no differences in machine performance or plant characteristics between the two irrigation levels for either year. Two-year average results are presented in the table.

There were important differences each year in harvesting efficiency as a result of spacing and variety. Also there were interactions of variety and spacing. Harvesting efficiency of all varieties increased with thicker stands but the increase varied with variety. It amounted to 6.7% for Deltapine Smooth Leaf, 5.7% for Auburn 56, and 2.3% for Empire. There were large differences in harvesting efficiency among varieties when thin spaced but not for thick spacings.

In 1960 there was no difference in harvested yield because of spacing. However, there were important differences among varieties. Deltapine Smooth Leaf had highest yield, with Auburn 56 second and Empire last.

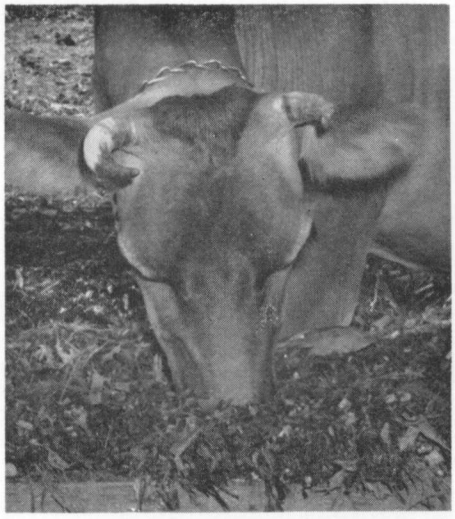
There was a reversal in 1961, with important yield differences resulting from spacing but no difference from variety. Spacing effects were not the same from all varieties. The 2-year average of all varieties showed practically no differences in weight of harvested cotton for plant populations of 20,000, 40,000, and 80,000 plants per acre.

Trash content was the same for all varieties, but increased with thicker stands. As plant population went from 8,000 to 120,000 plants per acre, plant height, limb length, and boll size decreased and fruiting height increased. There was no lodging in any of the plots.

Based on results of the test, a stand of 20 to 80 thousand plants per acre is suggested for irrigated cotton for mechanical harvest on heavy soils comparable to Decatur clay. Although Empire had best harvesting efficiency, Deltapine Smooth Leaf and Auburn 56 had higher harvested yields. All three varieties should be satisfactory in areas where adapted.

PLANT CHARACTERISTICS AND MACHINE PERFORMANCE DATA FOR DIFFERENT VARIETIES AND SPACING AT TWO IRRIGATION LEVELS, TENNESSEE VALLEY SUBSTATION, 1960-61 AVERAGE

Variety, number of plants per acre	Lint/acre		Harv. eff.	Trash cont.	Plant ht.	Limb length	Ht. of low limb	Lint per cent	Bolls per lb.	Micronaire	Boll rot loss, lint/a.
	Total	Harv.									
	Lb.	*Lb.*	*Pct.*	*Pct.*	*In.*	*In.*	*In.*	*Pct.*	*No.*	*Index*	*Lb.*
Empire											
8,000	1,005	938	93.5	4.7	52	35	1.5	37.3	54	3.8	74
20,000	1,000	943	94.2	4.9	48	27	2.4	37.0	58	3.6	70
40,000	950	901	94.8	6.0	42	14	4.7	36.9	62	3.5	79
80,000	922	884	95.8	5.9	37	9	5.8	36.8	66	3.4	79
120,000	914	876	95.8	6.3	35	7	6.7	36.8	67	3.5	82
DPSL											
8,000	1,018	896	88.0	4.9	56	36	1.3	39.5	73	4.3	55
20,000	1,102	1,014	92.1	5.1	56	28	2.5	38.8	80	3.9	62
40,000	1,073	1,002	93.5	5.2	49	16	4.6	38.8	85	3.8	43
80,000	1,110	1,047	94.4	5.8	49	12	6.0	38.1	85	3.8	45
120,000	1,030	975	94.7	6.1	42	9	7.4	38.5	90	3.6	53
Auburn 56											
8,000	970	870	89.8	5.0	53	36	1.7	36.8	67	4.1	46
20,000	1,095	1,017	92.7	5.3	50	28	2.3	37.0	70	3.9	48
40,000	1,040	983	94.5	5.8	46	15	4.1	36.6	73	3.8	71
80,000	1,031	980	95.5	5.5	43	12	5.8	36.7	75	3.9	60
120,000	980	927	94.5	5.9	42	9	7.5	36.6	79	3.7	87



How Good Are Sorghum Silages?

L. A. SMITH,[1] H. W. GRIMES,[1]
G. E. HAWKINS,[2] J. A. LITTLE,[2] and
R. M. PATTERSON[3]

SWEET SORGHUM produces high yields of silage. But don't expect top milk production when feeding this roughage to dairy cows.

In tests at the Black Belt Substation, sorghum silage was inferior to johnsongrass hay and corn silage. Supplementing the silage with johnsongrass hay resulted in higher milk production than from silage alone.

Yield, Quality Measured

The 1959-62 studies measured yields of sweet sorghum silages and compared nutritive value of sweet sorghum and Sudax-11 silages with either johnsongrass hay or corn silage. Previous tests with Sart sorghum silage, cut when grain was in the dough stage, indicated that nutritive quality was low. Sorghum is a grass, and most grasses have highest nutritive value before seed heads form. Therefore, Sart was cut and ensiled at the vegetative, boot, and dough stages and nutritive value was determined.

Sart cut at the vegetative stage produced about 2 tons of forage dry matter at the first cutting, which was only 38% as much as it yielded at boot and dough stages. However, under favorable growing conditions regrowth brought total dry matter yield up to or above that made when cut in the dough stage. Dough stage harvesting gave slightly greater yields than cutting at the boot stage.

Crude protein decreased with maturity, going from 8.6% for vegetative stage to 7.7% for boot and 5.2% for dough stage. Digestible protein was even lower, ranging from a high of 2.6% for vegetative Sart to zero for that cut in the dough stage. Digestibility (dry matter basis, as are other composition and digestion values) averaged 61.0% for vegetative stage Sart, 55.5% for boot stage, and 56.8% when cut at dough stage.

Milk Production Compared

In the lactation studies the cows were fed all the Sart silage they would eat during the day and 1.1 lb. of johnsongrass hay per 100 lb. of body weight at night. Consumption of all Sart silages was low, representing 38% to 46% of total forage dry matter intake. Amount of Sart silage eaten was not affected by maturity at harvest.

Daily milk production of cows fed Sart silage cut at the three maturity stages averaged 31.2 lb. for vegetative, 30.5 lb. for boot, and 30.6 lb. for dough stage. This compares with the average of 32.2 lb. per day for cows fed johnsongrass hay as the only roughage. Feeding 2 lb. of cottonseed meal daily to cows on Sart silage upped production.

Adding 100 lb. of ground snapped corn per ton of vegetative Sart ensiled increased digestibility and consumption of the silage. But the addition increased milk production only 0.3 lb. per cow per day.

Varieties Tested

Yield of FS-1A sorghum ensiled in the dough stage was the same as that of Sart cut at same maturity. However, the 7.9% crude protein, 3.5% digestible protein, and 59.5% digestible dry matter content of the variety was greater than the Sart silage. Also, the cows ate more of the FS-1A silage. The greater consumption resulted in a 1.0 lb. higher daily milk production than was recorded for cows fed Sart ensiled at the dough stage.

In another test, NK-300, Yieldmaker, and Beefbuilder sorghum silages cut in the dough stage and Sudax-11 cut in the vegetative stage (with 200 lb. ground snapped corn added per ton) were compared with Dixie 18 corn that was cut in the dough stage. Tons of dry matter produced per acre were: NK-300, 4.3; Yieldmaker, 3.7; Beefbuilder, 3.8; Sudax-11, 2.2; and Dixie 18 corn, 1.9.

Crude protein contents of the sorghum and Sudax-11 silages were low, ranging from 4.8% to 5.7%, as compared with 7.7% for Dixie 18 corn silage. The corn silage was far superior in digestible protein content with 3.9%, as compared with 1.0% or less for NK-300, Yieldmaker, Beefbuilder, and Sudax-11. Digestible dry matter contents of the silages were: NK-300, 57.3%; Yieldmaker, 52.5%; Beefbuilder, 56.8%; Sudax-11 (with corn added), 60.4%; and Dixie 18 corn, 64.7%.

Test cows ate about the same amount of NK-300, Yieldmaker, and Beefbuilder silages, but consumption averaged about 15% less than for Sudax-11 and Dixie 18 corn. Higher digestibility of Sudax-11 and corn silages resulted in greater milk production. Average daily production of cows fed the silages was: NK-300, 29.3 lb.; Yieldmaker, 28.5 lb.; Beefbuilder, 30.3 lb.; Sudax-11, 33.9 lb.; and Dixie 18 corn, 33.4 lb.

The Black Belt Substation study yielded major findings in three areas:

(1) Total annual yield of Sart sorghum was not greatly affected by stage of maturity at which it was cut. Yields of different varieties were similar within years – Sart and FS-1A in 1960 and NK-300, Yieldmaker, and Beefbuilder in 1961. The sorghums outyielded Sudax-11 and Dixie 18 corn in the 1961 test.

(2) Cows consumed more digestible dry matter when fed corn silage than on any of the sorghum silages. Intake of digestible dry matter was higher with johnsongrass as the only roughage than when a combination of sorghum silage and johnsongrass was fed.

(3) Cows fed johnsongrass hay as the only roughage consistently outproduced those fed FS-1A or Sart silage plus johnsongrass hay. However, differences were small. Milk production was greater when cows were fed Dixie 18 corn silage or Sudax-11 ensiled with corn added than for those on NK-300, Yieldmaker, or Beefbuilder sorghum silages as the only roughage.

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Ten Years of SOIL TESTING in Alabama

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Soil testing is a valuable aid in determining lime and fertilizer needs of soils.

As a soil is cropped, limed, and fertilized, its fertility is changed in ways that are not obvious to the grower. Some plant nutrients may accumulate while others are depleted and the soil reaction may change. For most efficient use of lime and fertilizer, these changes need to be measured so that lime and fertilizer treatments may be adjusted to meet the changing soil conditions. A chemical soil test is the best way to detect such changes and, when properly calibrated with results from field experiments, it is the best basis for lime and fertilizer recommendations.

Soil test results from many samples also provide an estimate of the general fertility conditions of an area. This information is of importance to suppliers and formulators of fertilizers as it indicates amounts of different fertilizer ratios needed in the various agricultural areas of the State.

What Soil Testing Shows

Since the soil testing laboratory of the Auburn University Agricultural Experiment Station began operation in 1953, annual summaries of results have been prepared according to soil series and then grouped for major soil regions in the State. Annual summaries are useful in revealing changes in fertility over a period of time. Combined summaries for the 145,000 samples analyzed during the 10-year period, Tables 1 and 2, show some important regional differences.

The distribution of soil pH values for the samples tested during this period is given in Table 1. Lime is recommended for alfalfa if the pH is below 6.5, for white clover, vetches, and several other plants if the pH is below 6.0, and for most other crops when the pH is below 5.7. The Sand Mountain area had the highest percentage of samples indicating a need for lime. The Black Belt clay soils that include the naturally calcareous soils had the lowest percentage of samples needing lime. It is evident from these data that about 50% of the soils needed lime. About 2 or 3% were extremely acid, less than pH 5.0. On such soils yields of most crops would be severely limited. Most soils needing lime were in the range where fair to good yields could be made without addition of lime. Under such conditions a farmer may lose 10 to 20% yield without being aware of a problem.

Table 1. Distribution of pH Values by Major Soil Regions

Soil region	pH			
	Below 5.0	5.0-5.5	5.6-6.0	Above 6.0
	%	%	%	%
Coastal Plain	2.1	42.4	33.9	21.6
Limestone Valleys	3.6	42.9	23.9	29.8
Sand Mountain	2.0	53.4	29.8	14.8
Black Belt clay soils	3.0	16.3	9.4	71.3
Piedmont	1.6	31.9	33.4	33.1
Gardens, lawns, shrubs	5.7	29.8	20.2	44.3

Summary of 145,257 samples analyzed from 1953 through 1962 by the Auburn Soil Testing Laboratory.

Phosphorus and Potassium Ratings

A summary of phosphorus and potassium ratings is given in Table 2. Sandy soils, Coastal Plain and Sand Mountain, showed the greatest percentage of soils high in phosphorus. More than one-half of the Black Belt samples were low in phosphorus. Differences in phosphorus fertility result from type of agriculture, past fertilizer practices, and soil differences. Samples from sandy regions have been largely from row crops. Samples from the Black Belt area were mostly from pastures. Those from the Piedmont and Limestone Valleys were more equally divided between pastures and row crops. In general, row crop areas have been more highly fertilized than pasture areas. Phosphorus is not lost by leaching, but is subject to losses through erosion.

Data in Table 2 show a greater need for potassium than phosphorus for all soils except those of the Black Belt. Potassium is subject to being leached from the soil and its level in the soil is not influenced as greatly by past additions as is phosphorus. Soil texture, cropping system, crop removal, and soil acidity all greatly influence the soil level of potassium. Sandy soils have a low reserve of native potassium for release into the available form and it is easily lost from such soils by leaching; therefore, larger or more frequent additions are required to maintain a desirable level of potassium.

Fertilizer Grades Change

In general, a greater buildup of phosphorus than potassium was found. This may have resulted from the longtime use of high phosphorus-low potassium fertilizer. The only appreciable change in average soil test values that occurred during the past 10 years was a decrease in the percentage of samples that were low in potassium and a like increase of samples medium in potassium. At least part of this shift can be credited to the change in fertilizer grades as a result of the emphasis given this low potassium situation. When the laboratory was started, the major grades were 4-10-7 and 6-8-4. These have been replaced by even phosphorus-potassium ratio grades such as 4-12-12 and 8-8-8.

These data show that soil pH values and phosphorus and potassium levels are so varied that any general or average recommendation could not fit the situation in over one-half of the fields. A soil test is needed as a guide to the most efficient use of lime and fertilizer.

Table 2. Distribution of Phosphorus and Potassium Soil Test Ratings by Major Soil Regions

Soil region	Phosphorus			Potassium		
	Low	Medium	High	Low	Medium	High
	%	%	%	%	%	%
Coastal Plain	20.6	33.2	46.2	50.5	38.4	11.1
Limestone Valleys	30.1	38.1	31.8	28.9	52.5	18.6
Sand Mountain	21.5	36.0	42.5	44.4	46.2	9.4
Black Belt clay soils	60.8	24.0	15.2	36.1	47.8	16.1
Piedmont	35.0	29.0	36.0	40.8	40.7	18.5
Gardens, lawns, shrubs	17.3	13.4	69.3	17.2	33.2	49.6

Summary of 145,257 samples analyzed from 1953 through 1962 by the Auburn University Soil Testing Laboratory.

WHAT CROP YIELDS CAN WE MAKE?

D. G. STURKIE and J. T. COPE, JR.
Department of Agronomy and Soils

WHAT ARE the yield limits of crops in Alabama? By harvest end each year most farmers believe larger yields could have been made if something different had been done.

In 1955 the Agricultural Experiment Station of Auburn University began tests at four locations to determine what yields could be obtained for a period of years when all known good production practices except irrigation were used. Since then additional tests have been started at four other locations.

Production practices include crop rotation, high fertilization, adequate liming, best varieties, planting at proper time, good land preparation, proper spacing, seed treatment, soil fumigation, winter legumes, and good weed, insect, and disease control.

Resulting yields under natural weather conditions at seven locations on upland soils show that potential production is considerably above average local yields on similar soils. The seven locations represent a total of 45 test years, Tables 1 and 2.

The highest acre yields obtained in any one year were: cotton, more than 2 bales at six locations; corn, 109 or more bushels at five locations; and soybeans, 36 or more bushels at four locations.

Of the 45 test year yields, 25 were in excess of 1.5 bales per acre and only 6 below 1 bale. Average was 1.6 bales.

In the case of corn, 13 of the 45 test year yields were more than 100 bu., 31 in excess of 75 bu., 38 more than 50 bu., and only 7 less than 50 bu. Average yield of all tests was 83 bu. The highest peanut yield was 2,969 lb. per acre and the average was 1,940 lb. The average soybean yield was 25 bu. per acre, with a top yield of 46 bu.

Dry weather has been the main cause of reduced yields at all locations. All tests suffered frequently from summer drought. The yields show the potential of these soils when weather is favorable, although it is doubtful that any year has been completely favorable. Higher yields could probably have been obtained with supplemental irrigation during dry periods. Even in the worst years, results of the tests show that possible production is much higher than average local yields from the same type of soils.

Most practices used are those recommended by the Auburn Station. A higher rate of fertilization than that recommended was used to make certain yields were not limited by the need for more fertilizer. The higher rates were not profitable and should not be considered as recommendations.

Fertilizer treatments followed were (per acre): (1) winter legumes to be turned before cotton and corn – limed to bring soil pH up to 6.5-6.8, and broadcast 1,000 lb. of 0-14-14 at time of turning; (2) cotton – 400 pounds of 4-12-12 drilled at planting and sidedressed twice, each with 48 lb. of nitrogen; (3) corn – 400 pounds of 12-12-12 drilled at planting and sidedressed once with 134 lb. of nitrogen; (4) soybeans – broadcast 1,000 lb. of 0-14-14 before planting and applied 37 lb. of nitrogen at last cultivation; (5) peanuts in rotation – applied no fertilizer but topdressed with 500 lb. of gypsum; and (6) broadcast a minor element mixture at time of turning the land for corn to follow.

These tests have also been of value in pointing up problems that might develop when extra large yields are attained. One developed as a result of the high rate of nitrogen on cotton. The cotton grew tall and lodged badly in some years. Occurrence of boll rot has been high in some cases. Spraying to control insects has been difficult with tractor equipment. It has been necessary to use high clearance sprayers or aircraft to avoid plant damage. Using a two-row tractor with a six-row boom at Prattville in 1961, the rows over which the tractor was driven made 1,100 lb. less seed cotton than the rows not driven over. No unusual problems have developed with corn, soybeans, and peanuts.

The tests are being continued, and as new practices are developed they will be included.

TABLE 1. LARGEST YIELD AT SEVEN LOCATIONS

Location	Crop			
	Cotton	Corn	Soybeans	Peanuts
	Bales	*Bu.*	*Bu.*	*Lb.*
Sand Mtn. Substa.	2.3	119	28	.....
Wiregrass Substa.	1.9	117	....	2,969
Main Station, Auburn	2.5	63	26	.....
Alexandria Field	2.0	79	41	.....
Brewton Field	2.2	123	46	.....
Monroeville Field	2.3	134	36	.....
Prattville Field	2.3	109	38	.....

TABLE 2. AVERAGE YIELDS AT SEVEN LOCATIONS

Location	Crop			
	Cotton	Corn	Soybeans	Peanuts
	Bales	*Bu.*	*Bu.*	*Lb.*
Sand Mtn. Substa., 5 yr.	2.0	93	28	.....
Wiregrass Substa., 8 yr.	1.4	91	....	1,940
Main Station, Auburn, 1 yr.	2.5	63	26	.....
Alexandria Field, 7 yr.	1.2	56	20	.....
Brewton Field, 8 yr.	1.7	103	30	.....
Monroeville Field, 8 yr.	1.7	78	21	.....
Prattville Field, 8 yr.	1.6	78	27	.....
Average	1.6	83	25	.....

Changes in the SEASONAL PATTERN of FARM PRICES

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Department of Agricultural Economics

SEASONAL PRICE CHANGES offer the Alabama farmer one of the best chances of making adjustments to his financial advantage.

Opportunities for such adjustments are pointed up in a study of changes in seasonal price patterns of important farm commodities by Auburn University Agricultural Experiment Station.

Farmers have witnessed changes in prices of farm products from one season to the next. Likewise, processors and those who use farm products are also aware of changes between seasons. Usually farm prices are low during peak harvest and rise to higher levels as supplies at the farm are reduced by sales. For the most part, price fluctuations result from changes in supply of and demand for commodities.

Production of agricultural commodities takes place on thousands of farms throughout the country, and individual farm operators make independent decisions concerning production and marketing. Because of a combination of conditions, such as a short harvest season, perishable products, and necessity to pay debts incurred, farmers may be forced to place excessive quantities of products on the market at a given time. An additional contributing factor with some products is the consumer's desire for greater quantities during certain seasons than at others. Therefore, it is reasonable to expect changes in prices within the year, among and within production areas, and from year to year.

Seasonal price patterns prevail for major farm commodities produced in the State. The amount of seasonal price change varies widely among commodities, and the pattern of high and low prices does not remain the same year after year. In general, seasonal price changes appear to be decreasing.

Commodity Price Changes

Eggs, broilers, and corn are examples of commodities that had more than a 20% change from the low average monthly price to the high average monthly price. Egg prices illustrate also the change in amount and in the pattern that sometimes takes place (see figure). The difference in the low and high average monthly prices in the 1953-62 period was less than half the difference that existed in 1948-54. There was only 1¢ per doz. difference in the low average monthly prices for the two periods, whereas approximately 11¢ per doz. was the difference in the high average monthly prices. Changes in seasonal patterns similar to those that have occurred with egg prices indicate that it was profitable for producers to alter production patterns and also that egg producers were making adjustments to take advantage of seasonal prices.

Broilers were among the three commodities for which the percentage change in seasonal prices had increased. However, the cents-per-pound price in the 1953-62 period had dropped and broilers were selling for only two-thirds the price they sold for during 1948-54. Differences in the seasonal low and seasonal high prices were the same in the two time periods. The proportional change was greater in the 1953-62 period because the price per pound was lower.

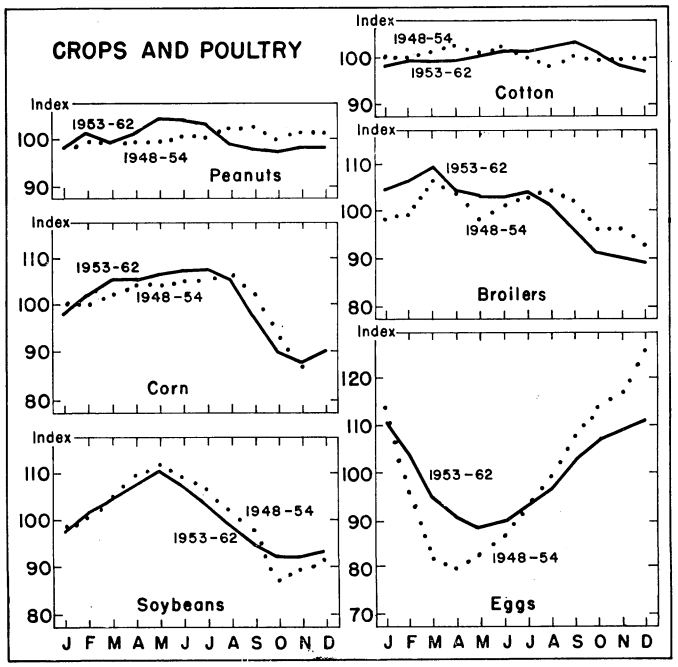
The amount of change in corn prices was identical during the two periods. The seasonal difference in soybean prices was less during 1953-62. The seasonal price changes for each crop almost followed the same pattern during each of the time periods. A low-level support program was in effect for these commodities, but average market prices were at levels that permitted seasonal changes in prices that could be significant.

The amount of seasonal variation in prices for both cattle and hogs was reduced. The only change in the pattern of high and low prices for these commodities was that the high in cattle prices occurred in April during the 1953-62 period, whereas the high came in March during 1948-54.

Changes in seasonal price patterns were evident but small in the case of both cotton and peanuts.

Using Price Changes

Individual farmers can exercise little control over major economic forces that contribute to commodity price fluctuations, but they can adjust enterprises to take advantage of seasonal price changes. Market information, when regularly obtained and adequately interpreted, can provide farmers the opportunity to alter plans and operations that will result in adjustment to market conditions. Market information obtained during crop harvesting season and at the time livestock are ready to be sold is useful. However, information obtained when plans for production are being made and throughout the growing season can indicate important steps that should be taken to adjust to changing situations.



Comparison of seasonal price patterns for selected crops and poultry, Alabama (1948-54 and 1953-62 = 100).

Livestock Production *and* Feed Use *in* Alabama

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Dept. of Agricultural Economics

INCREASED PRODUCTION of livestock and poultry was among the major developments in Alabama's agriculture during the past decade.

Results of studies by Auburn University Agricultural Experiment Station show that significant changes occurred in the production of poultry, eggs and milk, Table 1. In respect to feed requirements, increases in broiler production was by far the most important. Pounds of broilers grown in 1962 were 9.6 times greater than that produced in 1953. Annual egg production increased 220% during this period.

Total milk production declined at an average annual rate of approximately 3%. The volume produced in 1962 was estimated to be 71% of that produced in 1953. Milk sold to plants and dealers increased 175% between 1953 and 1962, and comprised 70% of the total production of milk in 1962. Milk sold to plants and dealers was 36% of the 1953 total.

Except for 1956, pounds of beef produced increased each year between 1953 and 1962. Production in 1962 was 19% greater than production in 1953, and 5.5% above the 10-year average. Fluctuations in hog production were evidently associated with the hog cycle. Production in 1962 was 4% below the 10-year average.

Feed Production in Alabama

A basic requirement for continued production of these commodities is an adequate supply of good quality feed. Producers of livestock and poultry in Alabama have to grow or purchase feed at a cost that is competitive with feed costs in other areas of the country.

Per-acre yields of feed crops grown in Alabama have increased. However, increases in yields were offset to a great extent by reductions in acreages. Total production of feed crops was not increased significantly in the past 10 years, Table 2. Production of corn fluctuated with favorable and unfavorable growing seasons. There was neither an upward nor downward trend during the 1953-62 period. Quantities of small grains and grain sorghums continued to be a minor part of the total feed production. Production of wheat increased, while that of oats and grain sorghum decreased. Soybean production increased steadily and was 70 to 80% greater at the end of the decade than at the beginning.

Tons of hay produced fluctuated from 869,000 to 501,000 tons, averaging 647,000 in the 10-year period. Silage production was estimated to be 234,000 tons in 1962, which was approximately 2½ times that of 1953.

The proportion of grain used on farms where grown varied among kinds of grains, but remained almost constant throughout the 1953-62 period for a particular grain. The greatest change was in the proportion of oats that was sold. Grains and respective ranges in proportions used on the farm were corn 66-74%, wheat 15-20%, oats 60-74%, grain sorghum 79-82%, and soybeans 2-3%. Above 90% of the hay remained on the farm.

Commercial Feed

The feed deficit that existed in Alabama in 1953 increased as a result of greater production of broilers, eggs, and cattle. Feed made available by decreases in milk production and in numbers of horses and mules on farms did not come close to offsetting increases in the volume of feed needed to support expanded production of broilers, eggs, and cattle.

Commercial manufacturers reported an average annual increase of 10% in total tons of feed sold in Alabama during the period 1953-62. Information was not available pertaining to tonnage of feed fed on farms where it was prepared, or fed to livestock and poultry belonging to individuals or firms owning the feed.

Almost 64% of the tonnage reported sold in 1962 was poultry feed. Sales of dairy feed increased 29% between 1959 and 1960, and since then has comprised about 10% of the total feed reported sold. Sales of hog feed amounted to about 5% of the total.

Continued improvement in the breeds of livestock and poultry, in nutrition, and in management practices will contribute to a reduction in the amount of feed required to produce a pound of meat, a dozen eggs, and a gallon of milk. Although feed needs may not increase at the exact rate of expansion of livestock and poultry production, the market for feed is expected to continue to grow in Alabama.

TABLE 1. PRODUCTION OF BROILERS, EGGS, MILK, CATTLE AND HOGS, ALABAMA, 1953-62

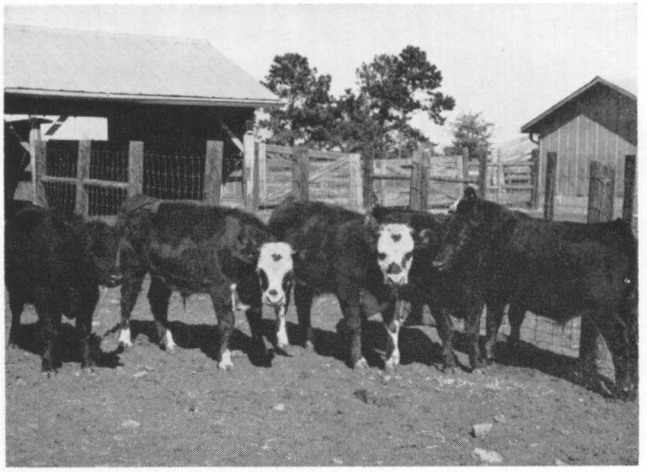
Year	Broilers	Eggs	Milk	Cattle	Hogs
	Mil. lb.	*Mil. doz.*	*Mil. lb.*	*Mil. lb.*	*Mil. lb.*
1953	73.9	62.3	1,308	393.2	236.6
1954	143.2	61.9	1,213	427.4	254.3
1955	179.1	65.7	1,204	431.1	287.4
1956	255.7	73.0	1,178	429.6	298.6
1957	332.4	80.6	1,135	433.2	267.1
1958	421.2	95.7	1,034	451.9	265.6
1959	522.2	106.1	998	471.1	310.9
1960	565.3	108.7	961	453.3	278.6
1961	673.3	114.0	956	460.2	279.4
1962	709.3	138.8	934	466.2	263.5
Average	387.6	93.7	1,065	441.7	274.2

TABLE 2. PRODUCTION OF FEED CROPS, ALABAMA, 1953-62

Year	Crops						
	Corn	Wheat	Oats	Grain sorghum	Soybeans	Hay	Silage
	Thou. bu.	*Thou. bu.*	*Thou. bu.*	*Thou. bu.*	*Thou. bu.*	*Thou. ton*	*Thou. ton*
1953	44,880	462	4,416	450	1,804	657	98
1954	27,573	528	5,458	294	1,140	622	135
1955	58,870	1,007	3,848	840	2,068	869	179
1956	47,736	1,840	4,896	608	2,255	656	162
1957	47,675	2,340	2,475	703	2,440	565	196
1958	55,614	2,300	2,528	744	2,794	725	358
1959	46,982	1,265	3,484	598	2,860	611	264
1960	44,330	1,200	2,975	480	3,192	568	296
1961	48,335	1,456	3,230	364	3,504	617	316
1962	35,026	840	2,822	240	3,054	501	234
Average	44,596	1,261	3,573	527	2,367	647	224

CROSSBREEDING Compared among BRITISH BREEDS

TROY B. PATTERSON,
Department of Animal Science



Crossbred steers graded slightly higher, one-third of a Federal grade, than purebreds in tests at the Auburn Station. In addition they gained faster in the feedlot and had heavier carcasses. Crossbred steers had an advantage of 39 lb. in adjusted weaning weight (48 lb. unadjusted) over the purebreds. Shown here is a typical group of crossbred steers on test at the Station.

Crossbred steers and heifers weaned heavier and gained faster on pasture than did purebreds in tests at the Auburn University Agricultural Experiment Station. In addition the crossbred steers gained faster in the feedlot, and had heavier carcasses that graded slightly higher than purebreds. Purebred calves were leaner probably as a result of their slower growth rate.

Breeds Compared

Twenty-four cows each of the Angus, Hereford, and Shorthorn breeds were bred to produce calves sired by bulls of each of three breeds. Thus, basic comparisons were available among purebreds and all possible types of crossbreds.

All cows were maintained under practical conditions. No differences in environment were deliberately introduced. All calves were raised on pasture without creep or nurse cow. At weaning (250 days of age) all calves were placed on pasture until weaning was complete. At least 2 weeks were allowed for adjustment after the youngest calf was weaned, before going in the feedlot. Thus the length of time on pasture varied from 2 weeks to 4 months depending on the age of the calf.

The steer calves were full fed a 30% roughage ration for an average of 222 days. Slaughter date was determined when the group reached the average grade of Choice. The average age at slaughter was approximately 19 months.

The heifer calves were full fed a 60% roughage ration for an average of 129 days. The heifers were indexed and retained as replacements for further crossbreeding work.

Table 1. Purebred and Crossbred Heifers Five-Year Average, 1957-61

Breeding	Heifers	250-day adjusted weaning wt.	Av. daily gain on test
	No.	*Lb.*	*Lb.*
Crossbreds	58	467.7	1.77
Purebreds	62	444.6	1.77
Difference	—4	23.1	0.00

Results

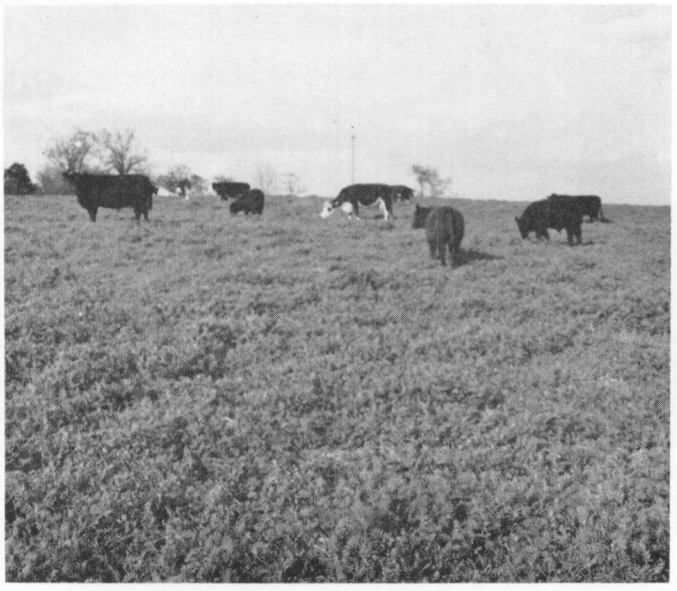
The crossbred heifers weaned 23 lb. heavier than did the purebreds. Further, the crossbred heifers gained 11 lb. more than the purebreds over a 95-day pasture period. There was no difference in feedlot performance of the two groups. Neither was there a difference in breeding score at the end of the test. Heifer performance for the 5-year test period is summarized in Table 1.

In general, crossbred steers also performed better than the purebreds. Crossbred steers had an advantage of 39 lb. in adjusted weaning weight (48 lb. unadjusted) over the purebreds. In addition, the crossbreds gained 21 lb. more than the purebreds on pasture in 11 additional days and 16 lb. more in the feedlot. This combines to a total of 85 lb. extra weight at slaughter that yielded 60 extra lb. of carcass (chilled). Based on current market prices this 60 lb. of carcass is worth $24. The crossbred steers graded slightly higher, one-third of a Federal grade, than the purebreds. This was largely the result of being fatter. There was no difference in rib-eye area per cwt. of carcass after correcting for differences in carcass weight. Steer performance and carcass data for the 5-year period are given in Table 2.

Table 2. Purebred and Crossbred Steers Five-Year Average, 1957-61

Breeding	Steers	250-day adjusted weaning wt.	Av. daily gain feedlot	Final feedlot weight	Chilled carcass weight	Federal carcass	Fat thickness	Adjusted carcass rib-eye
	No.	*Lb.*	*Lb.*	*Lb.*	*Lb.*	*Grade*[1]	*In.*	*Per cwt.*
Crossbreds	63	483.0	2.01	987.2	607.1	12.9	0.71	2.14
Purebreds	59	443.7	1.94	902.1	546.8	12.2	0.61	2.16
Difference	4	39.3	0.07	85.1	60.3	0.7	0.10	—0.02

[1] Grading system: 11-High Good; 12-Low Choice; 13-High Choice.



Scenes like this are becoming more common as vetch becomes more popular as a grazing crop on Alabama farms. Grazing management is highly important in getting the most return from vetch pasture, as revealed by results of Auburn University Agricultural Experiment Station studies. Close clipping consistently resulted in reduced forage production and often caused stand damage.

Clipping Height Affects Production of Vetch Forage

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Department of Agronomy and Soils

THE HEIGHT AT WHICH VETCH is clipped or grazed can make a big difference in amount of forage produced. Recent experiments at Auburn University Agricultural Experiment Station reveal that close clipping of vetch can seriously reduce yields and stands.

Common vetch has long been used as a winter green manure crop on Alabama farms. Now that it is being used to a greater extent for grazing, information is needed on effects of different clipping or grazing management systems.

When grown in small plots and repeatedly clipped close, vetch often produces yields lower than that made by many winter clovers. It has also been observed that stands of vetch under close clipping or grazing decline as the season progresses, whereas under moderate grazing stands persist and yields are satisfactory. This suggests that height of stubble is a factor in vetch productivity.

Summarized in the table are results from greenhouse experiments during the past two winters. Warrior variety was used in the study to learn effects of clipping height on stands and forage production. This variety, developed by the Auburn Station, is resistant to the vetch weevil, making seed production possible in the State.

Forage Production Affected

Height at which vetch was cut had an important effect on forage production. Vetch 12 to 15 in. tall that was clipped to a 3-in. stubble yielded only 65% as much forage as when clipped to a 6-in. height.

Recovery was much more rapid when clipping was at the 6-in. height. This faster regrowth resulted in one additional clipping during the growing season. Clipping vetch in the 3-leaf stage the first time did not affect subsequent production.

When defoliation included removal of the lowest leaf, forage production was less than that from the 3-in. stubble height clipping. Production was reduced still further when the plants were clipped below the lowest leaf axil (junction of leaf with stem) since this treatment removed the axillary bud and delayed recovery of the plant. The stubble height was 1½ in. when clipped to leave only the lowest leaf axil and 1 in. when clipped below the lowest leaf axil. Regrowth was slow when all leaf axils were removed because plants had to grow new buds before any new growth was possible.

When 12- to 15-in. vetch plants were clipped below the leaf axil, forage production was similar to that resulting from clipping 6- to 8-in. plants to 3-in. stubble height. Both of these clipping treatments sharply reduced growth of vetch plants.

Stands Reduced by Clipping

Vetch stands were reduced when plants were clipped to remove the lower leaves. Even further reduction resulted when the leaf axils were removed. Stands were not appreciably reduced by the other clipping treatments.

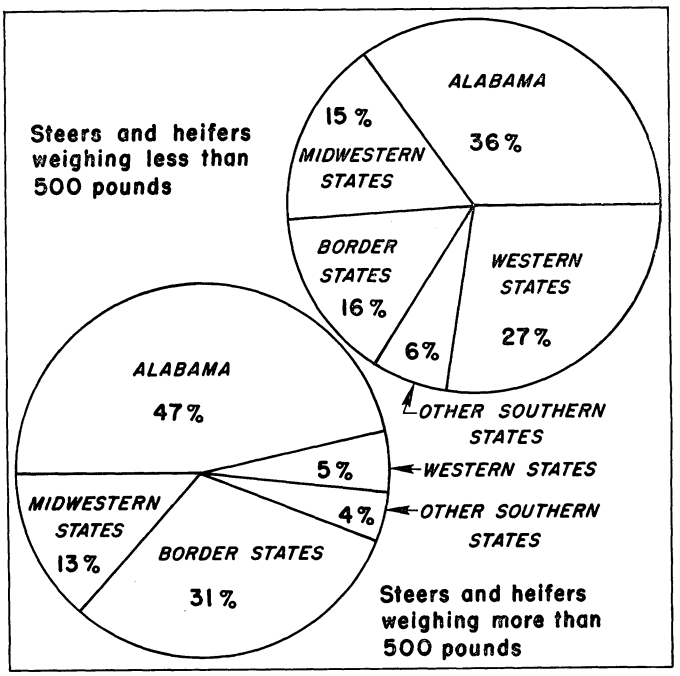
These results emphasize that close grazing of Warrior vetch should be avoided. Higher yields and more uniform production can be made if vetch is grazed no closer than 6 in.

EFFECT OF CLIPPING ON STAND AND FORAGE PRODUCTION OF WARRIOR VETCH

Clipping treatments		Number of clippings	Stand after 83 days	Forage yield[1]
Height at first cut	Height at later cut			
		No.	*Per cent*	*Per cent*
Cut to 6-in. stubble				
12 to 15 in.	12 to 15 in.	4	100	100
Cut to 3-in. stubble				
12 to 15 in.	12 to 15 in.	3	94	65
3-leaf stage	12 to 15 in.	3	95	63
3-leaf stage	6 to 8 in.	5	90	33
Cut below lowest leaf				
12 to 15 in.	12 to 15 in.	3	61	48
Cut below lowest leaf axil				
12 to 15 in.	12 to 15 in.	3	38	40

[1] Given as per cent of best treatment.

These charts show destination of feeder steers and heifers sold through Alabama auctions in 1962, according to weight classes.



ALABAMA CATTLE GO EVERYWHERE

M. J. DANNER and RALPH MEADOWS
Department of Agricultural Economics

ALABAMA CATTLE get around. Cattle and calves sold through Alabama auction markets in 1962 went to at least 26 states, according to results of an Auburn University Agricultural Experiment Station study.

The cattle industry in Alabama is geared principally to production of nonslaughter animals. Of the total number of cattle and calves sold at State auction markets in 1962, 68% were classified as nonslaughter. This estimate is based on data collected for 6 weekly periods during that year. Seasonal distribution of total sales of cattle and calves is given below for the sample periods:

Sample period	*Percentage of cattle sold*
February 4-10	9
April 15-21	10
June 10-16	16
August 19-25	22
October 7-13	23
November 25-December 1	20

As revealed by these data, about two-thirds of sales occurred in the last half of the year. More than two-fifths were in the last 3 months.

Nonslaughter Cattle Leave State

Movement of cattle out of State is greater for nonslaughter than for slaughter cattle. About two-fifths of the slaughter cattle moved across state lines, but almost three-fifths of nonslaughter cattle left the State. However, only 5% of the slaughter cattle went to states other than those bordering Alabama, while 38% of the nonslaughter kinds went to other than adjoining states.

The destination of nonslaughter cattle sold through auctions in Alabama is shown below:

Destination	*Percentage of total*
Alabama	44
Western States	20
Adjoining states	18
Midwestern States	13
Other Southern States	5

Shipments to Western and Midwestern States amounted to 42% of the central Alabama cattle sales. And this area accounted for almost three-fourths of the nonslaughter cattle sold in the State.

Steers and Heifers Predominate

Steers and heifers made up over five-sixths of total sales of nonslaughter cattle. The remainder was principally replacement cows, which generally stayed in the area where sold. Among the feeder steers and heifers, 79% were lighter than 500 lb. and only 21% weighed more than 500.

It is evident that Alabama's feeder cattle industry is based on marketing lightweight calves principally off grass. Also evident is the fact that these feeder calves are not of the weight most desired for a farm or commercial feedlot finishing operation. Neither are such calves satisfactory for slaughter. These limitations highly influence the movement of feeder cattle and calves sold through Alabama auctions, as shown by the chart.

Lightweight Cattle Leave Home

Almost 4 out of 5 of the feeder steers and heifers heavier than 500 lb. remained in Alabama or adjoining states. About 13% were shipped to Midwestern States. On the other hand, only about half of the feeder calves weighing less than 500 lb. stayed within Alabama or adjoining states. Shipments of these calves to Texas, Oklahoma, and other Western States accounted for 27% of the total. Marketings of the lightweight calves are seasonally heaviest in the fall months, which is also the beginning of the grazing period for fall-seeded winter wheat and other small grains, particularly in western areas. This demand has undoubtedly influenced the development of Alabama's feeder cattle industry.

With the State's cattle industry geared to production of lightweight feeder calves, there is no scarcity of such animals, particularly in the last half of the year. However, these calves are not ready for the feedlot nor are they ready for slaughter. Research currently underway at the Agricultural Experiment Station is aimed at learning what production and marketing changes are needed to more efficiently handle these kinds of calves.

SOURCES and QUALITY of Southern pea seed in Alabama, 1962-63

SAM T. JONES, *Department of Horticulture*
C. C. CARLTON, *Chilton Area Horticulture Substation*

SOUTHERN PEAS for market are grown on approximately 14,000 acres in Alabama each year. In addition, they are planted in almost every home garden in the State.

The term southern pea refers to blackeyed peas, crowder peas, purple hull peas, lady peas, and other types of cowpeas grown for human consumption. It is meant to exclude those types of cowpeas grown for soil-building and forage.

Obtaining high quality seed of proper variety is a difficult problem with production of southern peas. Being unfamiliar with the numerous varieties and their characteristics is one of the principal reasons. Misunderstandings between seedmen and growers as to the variety bought or sold and its proper varietal characteristics have caused numerous complaints. Most varieties and varietal names now in use in Alabama are not products of organized plant breeding programs of recognized experiment station or commercial concerns, but are selections and names made popular by general use. Therefore, no proper varietal description exists and such a description may be impossible because of unstable nature of varieties in the trade carrying a particular variety name.

To clarify the problem and aid in obtaining stability to varietal characteristics, a study was begun in 1962 at the Chilton Area Horticulture Substation of Auburn University Agricultural Experiment Station to investigate the source and quality of southern pea seed available to Alabama growers.[1]

All southern pea seed samples collected by the seed inspectors for the State Seed Laboratory, in routine inspection of all seed offered for sale in Alabama were analyzed by the Laboratory and forwarded to the Auburn Station for planting to determine varietal trueness and purity. Copies of the official report accompanied the samples.

From an analysis of field data, any differences between seed samples from different sources bearing the same varietal name could be noted. Also any samples bearing different names but proving to be the same when characteristics were compared could be determined. Varietal mixtures not detectable from seed characteristics alone could also be determined.

A total of 229 seed samples was obtained during the 2 years covered by this study. Thirty-five distinct varieties were represented, see table. However, a total of 82 different varietal names was used. Some varieties had five or more names being used in the trade to designate the same variety. For example, Bunch Pinkeye Purple Hull had 10 different names. Knuckle Purple Hull Crowder had 9 different names. In some cases the name variations were only minor, but minor variations in names apparently become progressively worse until one name grades into another and the varietal distinction is then lost.

There were 36 samples distinctly off-type or erroneously labeled as to variety. This number did not include numerous minor variations that had no consequence to either the seedman or the grower. There were 22 samples mixed extensively but not labeled as such. Some of these were detected by laboratory seed analysis. However, many could not be detected by seed examination alone. Most mixed samples involved pod color as in Silver Skin Brown Crowder. Samples used were grown in 11 different states and shipped from 36 different companies.

Results of this study show that grower complaints as to inability to obtain southern pea seed of reliable purity and trueness to variety may often be justified. However, seedmen are generally unable to improve the situation because of lack of standard varietal descriptions and agreement as to proper varietal characteristics of most varieties being offered for sale.

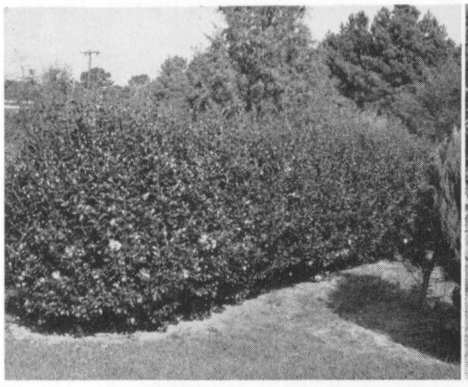
[1] This study was in cooperation with G. M. Moore, chief seed analyst, and C. A. Harris, former analyst, State Seed Laboratory, Montgomery.

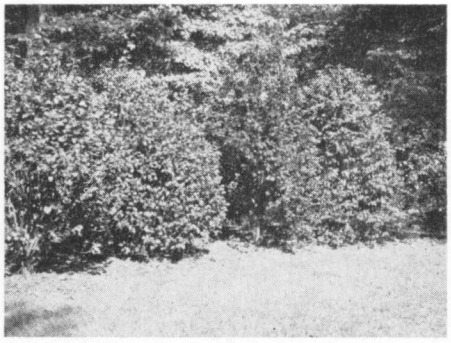
VARIETY NAMES, CHARACTERISTICS, AND QUALITY OF SOUTHERN PEA SEED OFFERED FOR SALE, ALABAMA, 1962 AND 1963

Variety	No. of samples obtained	No. of synonyms used	No. of samples off-type	No. of samples mixed
1. Knuckle Purple Hull Crowder	20	9	2	0
2. Purple Hull Brown Crowder	18	1	3	0
3. Silver Skin Brown Crowder	9	4	2	5
4. Brown Sugar Crowder	12	2	1	5
5. Brown Crowder	10	4	2	0
6. Purple Hull White Crowder	11	5	5	1
7. Vining Purple Hull	4	3	3	1
8. Texas Purple Hull No. 49	9	3	1	2
9. Bunch Pinkeye Purple Hull	18	10	4	5
10. Long Pod Purple Hull Red	7	3	0	0
11. Speckled Purple Hull	2	1	0	1
12. Dixie Lee	7	2	1	0
13. Blue Goose	13	1	1	0
14. Calico Crowder	9	3	3	0
15. Black Crowder	8	1	2	0
16. Blackeye Crowder	5	1	1	0
17. Alabama Giant Blackeye	1	1	0	0
18. Calif. Blackeye No. 5	20	5	2	1
19. Early W.R. Ramshorn Blackeye	4	2	0	0
20. Calif. Blackeye No. 3	2	1	0	0
21. Texas Cream No. 8	1	1	0	0
22. Texas Cream No. 12	1	1	0	0
23. Texas Cream No. 40	8	2	0	0
24. Conch	3	2	1	0
25. Lady	4	3	0	0
26. Running Acre	3	1	1	0
27. Purple Tip Crowder	1	1	0	0
28. Combine Crowder	2	1	0	0
29. Combine Crowder No. 1575	2	1	0	0
30. Whippoorwill	4	2	0	1
31. Turkey Crowder	2	1	0	0
32. Early Six-Weeks Browneye	2	1	1	0
33. Jackson 21	1	1	0	0
34. Brabham	2	1	0	0
35. Iron-Clay Mixture	2	1	0	0
Total	229	82	36	22

CAMELLIAS for Alabama Landscape

HENRY ORR, *Department of Horticulture*





At left is a hedge of sasanqua camellia, at right are two forms of common camellia, and above is a border of miscellaneous common camellias.

How did your camellias fare during last winter's freeze?

Prior to the freezes of 1962-63, the mention of camellias generally produced visions of lovely, exotic specimen flowers. The shrub bearing these flowers was often grown as a specimen in a collection. The common camellia with its many varieties has long been prized in the South for its flowering effect. Only in recent years has this species become popular for the many contemporary landscape shapes of its various varieties.

Along with this reevaluation of the common camellia for landscape use, other species of camellias have become known for their landscape usage. The sasanqua camellia has been used extensively in the landscapes of Alabama and other Southern States in the last 10-20 years. A less used but valuable landscape camellia is the bohea tea camellia.

All should not be considered lost from the freezes last winter. Many varieties of both common camellia and sasanqua camellia were hardy even in adverse locations to the extremes experienced last winter. Seemingly no damage resulted to planting of bohea tea camellias. Often slight or no vegetative damage resulted on plantings of common camellia and sasanqua camellia in relatively ideal locations. Some varietal differences were noted in these locations. An ideal location included these criteria: wind protection; filtered, partial evergreen shade; moist but well-drained soil; organic soil of moderate fertility; and protection from early morning sun.

Hardy varieties of common camellias included:

Variety name	*Color of flower*	*Form of plant*
Betty Sheffield*	White striped and blotched	Compact, rounded
Magnoliaeflora*	Blush pink	Compact, rounded
Elegans (Chandler)*	Rose pink	Spreading
Flame*	Red	Compact upright
Berenice Boddy	Light pink	Upright
Pope Pius IX	Red	Compact upright
Mon Louis	Light pink	Upright
Arejishi	Dark rose	Open, upright
Governor Mouton	Red	Upright
Herme	Pink to red	Upright

* Seventeen varieties were examined at four locations in Auburn by members of the Auburn Camellia Club. The first rating was made on January 12, 1963 and the last on August 10, 1963.

In general, sasanqua camellias in full flower at the time of near zero or subzero freezes were severely damaged. At Callaway Gardens, Pine Mountain, Georgia, and in the Collection Gardens, Auburn University, practically no damage was noted on the following varieties:

Variety name	*Color of flower*	*Form of plant*
Floribunda	White edged lavender	Upright, spreading
Texas Star	Light pink	Narrow upright
Shichi-Fukujin	Rose pink	Upright
Setsugekka	White	Upright, irregular
Cleopatra	Rose pink	Compact upright
Crimson Tide	Red	Compact upright

Most observers, including the group from the Auburn Camellia Club, have found that cold damage was extremely variable on susceptible varieties at a single location. One plant would be dead or almost dead while another of the same variety was only slightly damaged. Yearly, early varieties, such as Arejishi and the Daikaguras, have flowered quite satisfactorily. None of the midseason or late varieties had flowers of satisfactory quality after the 1962-63 freezes. In a more "normal" year, even if the swollen buds on midseason varieties had been frozen, the less developed buds on late varieties generally would have been practically unhurt and effective flowering would have resulted.

A quiet, dignified effect, complimentary to the house is generally considered to be ideal in developing the public area of the home grounds. Well-chosen varieties of camellias can be planted at the corners of the house, or to frame the entrance steps, or to be used as specimens and masses in the boundary plantings that might partially enclose public area.

The private area of the home grounds should afford the maximum utility and beauty where the various members of the family can relax and become refreshed through contact with nature. Here camellias can be effectively used around the house itself, but especially can be valuable in the border plantings. These attractive evergreen plants are usable throughout the year as backgrounds to annuals, perennials and even lower woody plants. They are outstanding as specimens. In limited soil areas with bare wall back-ground, camellias trained to grow on walls (espaliered) can be an invaluable asset to the landscape.

Most of the overstory in the area at left has been marked for a better stand. The area at right has been row-thinned to proper stand.

FAYETTE EXPERIMENT FOREST

E. L. McGRAW, *Department of Publications*

AN IMPORTANT CROP – trees – that comprises two-thirds of the State's acreage occupies a prominent place in the research program at the Auburn University Agricultural Experiment Station.

Forestry research is conducted at four outlying units in addition to the Main Station at Auburn. The largest of these is the Fayette Experiment Forest where the research program was begun in 1945. The forest project was established in 1944 with a purchase of 910 acres of land. Additional purchases in 1946 increased the area to the present total of 1,400 acres. The administrative area consists of 10 acres while roads, rights-of-way, and a small pond occupy another 25 acres. The remaining 1,365 acres are in various stages of timber production. The original program was designed to study and evaluate reproduction, growth, quality, and composition of stands resulting from different methods of handling natural stands; to determine the economics of establishing, producing, and utilizing artificial stands of pine; and to develop a profitable use for inferior hardwoods.

Past and Present Conditions

At the time of purchase, the forest consisted of cut-over, burned-over, low-grade stands of loblolly-shortleaf pines and miscellaneous hardwoods. A large portion of the forest had only scattered or no trees of merchantable size. Approximately 35% of merchantable sizes in better stands consisted of culls or undesirable species with low values. Desirable reproduction was unsatisfactory on 60% of the area.

Present natural timber types are largely loblolly-shortleaf, pine-hardwoods (oak and hickory) with areas of oak-hickory, pure loblolly pine, mixed hardwoods and pine, white oak, and yellow poplar. The latter two types are limited to the upper ends of a few narrow stream bottoms. Age classes range from 0 to 60 years. Even and uneven aged stands are represented.

Early plantations were mostly loblolly or slash pine with only two small areas of longleaf. Later plantations have generally been loblolly.

Research Program

The average farm woodlot today is a poor producer. Yet the woodland owner would like to have his timber producing a good return – but he wants to do it within the income of the forest area involved, that is to say, pay its own way. Extensive management and economic studies were the first to be established.

A woodland management study was established on 5 forest units in 1951 ranging in size from 80 to 240 acres and totalling 720 acres. The objectives of this study were to improve the quantity and quality of growing stock and to produce the largest quantity of high quality forest products possible while keeping the cultural costs within the income from these units.

A study of producing fence posts from early thinnings was established in 1951. The main objectives were to determine the cost of producing fence posts and stumpage return from a fence-post operation.

Intensive studies in the field of silviculture involve hardwoods as well as pine and include such problems as site preparation for seeding or planting, and weed tree control by fire, herbicides, or machinery.

In 1953, a study of the effects of site preparation and cultivation on yellow poplar was begun on an old field. The field had a mixed stand of sericea, clover, johnsongrass, broomsedge, trumpet vine, and briars on an alluvium soil. Seedlings were small and 2 years of extreme drought prevailed. The main objective was to determine the best method for planting yellow poplar in old fields.

Results indicated that plantings on undisturbed soils and in furrows were practically failures, whereas plantings in plowed ground followed by two cultivations were highly successful; heights averaged approximately 33 ft. in 7 years.

One early study established in 1951 was on the use of ammate to control hardwood weed trees. A study in progress since 1959 is on the conversion of upland hardwoods to pine, and an intensive study was begun in 1952 on the use of fire and herbicides to control hardwoods in mixed loblolly-shortleaf pine stands.

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