VOLUME 14, NUMBER 1 SPRING 1967

HIGHLIGHTS

OF AGRICULTURAL RESEARCH

ALFALFA . . .
damaged by alfalfa weevil unless insecticides used, see story on page 3

AGRICULTURAL EXPERIMENT STATION
AUBURN UNIVERSITY

HIGHLIGHTS *of* Agricultural Research

A Quarterly Report of Research Serving All of Alabama

VOLUME 14, NO. 1 SPRING 1967

In this issue . . .

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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. 373. Research for Soybean Producers summarizes results of latest Auburn research on soybean production, harvesting, drying, and storage.

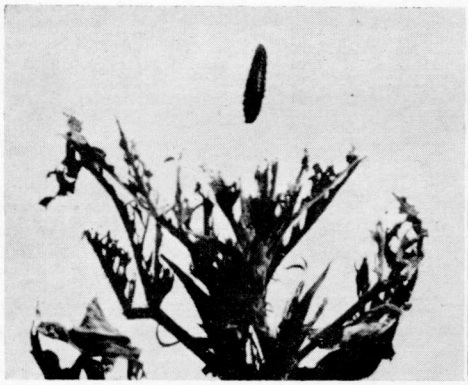
Cir. 136. Nitrogen for Dallisgrass Pastures in the Black Belt relates how nitrogen applications can be of value on dallisgrass pastures lacking productive stands of clover.

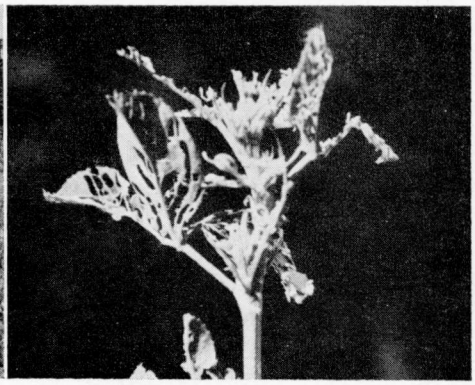
Cir. 152. Spacing and Rates of Nitrogen for Corn presents detailed data showing how close spacing and high rates of nitrogen work together for high yields.

Leaf. 68. Biology and Control of Spider Mites on Cotton in Alabama describes the increasing importance of this pest and reports results of control experiments.

Leaf. 73. Atkinson, A New Rootknot and Wilt Resistant Tomato Variety announces the development and release of the South's first commercial tomato variety that is resistant to nematodes and wilt.

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





At left is plant damage with alfalfa weevil larva; center, field of alfalfa where foreground is untreated and background treated; and at right is typical alfalfa weevil damage.

The ALFALFA WEEVIL and its CONTROL

MAX H. BASS, *Department of Zoology-Entomology*

THE ALFALFA WEEVIL, *Hyper postica* (Gyll.), a relative newcomer to Alabama has spread since its first detection in 1958 to all alfalfa-growing sections of the State.

Habits of Weevil

The adult weevil remains in and around alfalfa fields all year. At the first cool weather in the fall the adults become more active and oviposition increases. Eggs are deposited in standing or fallen alfalfa stems beginning about the first of November, and egg-laying activity continues until late spring. As the weather becomes colder the insects become inactive, but on warmer sunny days during mid-winter, adult weevils can be seen moving about.

Warm periods of a week or longer occurring during winter can be advantageous as considerable numbers of eggs hatch and the larvae usually die within a few days because of the absence of adequate food or ensuing cold weather.

The first large larval hatchout usually occurs simultaneously with the first flush of alfalfa growth in the spring. In Alabama this occurs about the first of March. Larval numbers continue to increase until the first cutting of alfalfa near the middle of April. The period of greatest damage to the alfalfa plant is usually from April 1 to 15 at which time larval population pressure is at its greatest.

The pupal stage begins in the field about the first week in April, and newly-emerged adults become numerous about the middle of April. Most newly-emerged adults feed for a week or two and then become dormant in and around the alfalfa fields. Dormant weevils can be found under debris in the fields, especially in the turf around the base of alfalfa plants; however, larger numbers can usually be found in trash samples collected near edges of the fields. Weevils remain inactive for remainder of the summer and become active again only after cool weather begins in the fall.

A few overwintering weevils and, perhaps, even some newly-emerged ones remain in the field during the summer and continue to lay eggs. These are relatively few in number, but plentiful enough so that some larvae can be found in Alabama during any month of the year.

Other Research

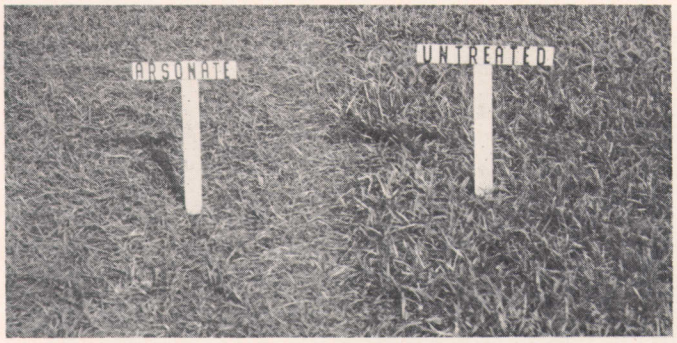
Research at Auburn University Agricultural Experiment Station has revealed that the adult alfalfa weevil shows a definite preference for night activity. Sweep net samples were made at hourly intervals one day each month for an entire year and of all adults collected during that study 87% were collected between 6 p.m. and 6 a.m. Larval activity was not influenced by time of day.

The alfalfa weevil prefers alfalfa for food, but is known to feed on at least 34 species of plants, most of which are close relatives of alfalfa. The author, with Dr. Carl Hoveland of the Department of Agronomy and Soils, found that the weevil would feed on mike clover (*Trifolium michelianum* Savi) with such voracity as to make this clover of questionable use to Alabama farmers. In 1965 Mr. Cooper King and Dr. Ed Donnelly, of the Department of Agronomy and Soils, and the author found alfalfa weevils feeding in damaging numbers on several strains of vetch. As alfalfa acreage decreases in the State the effect of this insect on crops related to alfalfa may become increasingly severe.

Control

At present, control methods that can be recommended for the alfalfa weevil leave much to be desired. Insecticides are available that will control this insect, but, unfortunately, these materials leave unacceptable residues on the alfalfa foliage and will result in insecticidal residues that exceed the established tolerances in meat and milk. Of those materials that can be used methoxychlor, 2 lb.; parathion, ½ lb.; diazinon, 1 lb.; and methyl parathion, ½ lb. per acre give better control results. These materials should be applied when the larval alfalfa weevil population begins to increase between the middle of March and the first of April. A second application should be made from one to two weeks after the first. The user should consult *Recommendations for Insect Control in Alabama 1966-67* for restrictions on the use of these materials.

Several new compounds show promise of being superior to anything presently recommended. One of these should be on the market within a year and should give full-season (spring) control with one application.



Controlling NUTGRASS (nutsedge) in lawns

D. G. STURKIE, *Dept. of Agronomy and Soils*

NUTSEDGE or purple nutsedge, frequently called "nutgrass" and a curse to many homeowners, can be controlled in lawns, Auburn research shows.

"Nutgrass" is not a grass but belongs to the sedge family. It develops bulbs, or "nuts," and chains of tubers under ground that produce new plants. This growth habit makes it difficult to control. Frequently, it spreads into flower beds, shrubbery, and walks where it becomes a serious pest.

The best method is to eradicate nutsedge before developing the lawn area. This is done by fumigating with methyl bromide which is a gas at normal temperatures. It must be applied underneath an airtight cover, such as polyethylene sheets. Methyl bromide should be applied when the soil temperature is 55° F. or above and according to the rate and method recommended by the manufacturer, usually 1 to 2 lb. per sq. ft. of area. The cover is left on for 24 to 48 hours.

If nutsedge is in lawns of zoysia or bermudagrass, it can be controlled by treating with one of the arsonates every 4 to 5 weeks. Treatment is started about June 1 and continued until October, requiring 4 to 5 applications per year. The treatment is continued each year until nutsedge is eradicated. Before treating the lawn should not be mowed for about a week to allow nutsedge plants to grow. This permits better coverage of plants with the herbicide. When lawn is cut closely just before application of the arsonate, not enough of the plant is left to retain sufficient herbicide for good kill. Mowing can be resumed 2 days after application.

Arsonates will kill centipede, bahia, and St. Augustine. Do not apply arsonate to these grasses.

There are several arsonates on the market. These are often designated as "crabgrass killers." They may be in powder or liquid form for spraying or as granules for application in dry form. In tests at Auburn University Agricultural Experiment Station, there was little if any difference in effectiveness of these various formulations. Therefore, the cheapest and most convenient should be used. The chemicals studied are listed above the table.

The experiment was conducted on a 15-year-old common bermudagrass sod. There was a heavy infestation of nutsedge when the test was begun in 1962. During the experiment the sod was kept cut at lawn height, about 1½ in. Granules were applied by dusting on the plants by hand. The powders and solutions were applied in water containing a wetting agent at the rate of 50 gal. per acre. At the same time the chemicals were applied to nutsedge in the bermudagrass, they were also applied to *Zoysia matrella* sod that contained no nutsedge. At the high rates, the chemical caused slight discoloration to both bermuda and zoysia but the effect soon disappeared. There was no permanent injury to the grasses during the 5 years of test.

The arsonates may be applied to lawns without danger to flowers and shrubbery if care is taken to prevent drift. There is no volatilization of the chemical and there is little danger of damaging nearby flowers or shrubs.

Nutsedge can cause serious damage to asphalt paving. It can be controlled by spraying at the recommended rate and frequencies given for control in lawns.

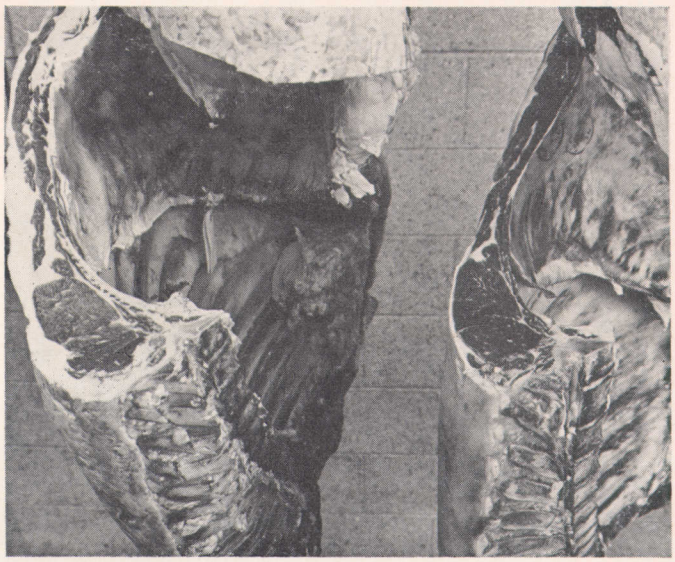
WARNING. Instructions of the manufacturer should be followed in handling *arsonates.* They are low in toxicity and should not be confused with the arsenites and arsenates which are highly toxic. There is little danger to animals from use of arsonates when instructions are followed.

Common name	*Trade name*	*Company*	*Chemical name*
CMA	Calar	Vineland	Calcium acid methane arsonate
CPA	Kleen-Up	Chevron	Calcium propyl arsonate
DSMA	Ansar 184	Ansul	Disodium methane arsonate
MAMA	Ansar 157	Ansul	Mono ammonium methyl arsonate
MAMA	Ortho crab-grass killer	Chevron	Mono ammonium methyl arsonate
MSMA	Ansar 170	Ansul	Mono sodium methyl arsonate

NUTSEDGE CONTROL RATINGS FROM TREATMENTS WITH DIFFERENT ARSONATES, AUBURN, ALABAMA

Treatment	Active/a. for applications[1]	Nutsedge ratings[2] on: 6/6 1962	6/21 1963	6/2 1964	6/10 1965	6/5 1966
	Lb.					
DSMA (184)	2	7.3	5.6	4.3	2.3	0
	4	6.6	4.0	2.3	2.0	0
	8	5.3	4.3	4.3	2.0	0
MAMA (157)	2	6.3	4.0	2.0	0.3	0
	4	6.6	5.0	1.0	0.6	0
	8	9.0	7.0	7.0	2.3	0
MAMA (O.C.G.K.)	2	9.0	5.0	1.0	0.6	0
	4	4.5	3.0	1.0	0	0
	8	3.6	3.6	2.6	1.3	0
MSMA (170L)	2	6.0	5.0	2.0	0.3	0
	4	5.0	4.0	4.0	0.6	0
	8	7.6	7.0	5.6	3.3	0
CMA (Calar)	2	7.3	4.3	3.6	3.0	0
	4	7.6	6.6	6.3	3.3	0
	8	8.3	5.6	6.0	2.0	0
CPA	50	4.0	1.3	0.3	0	0
(Kleen-Up)	100	4.0	1.6	0.3	0	0
MAMA + 2,4-D (290D)	2	4.3	4.6	3.6	2.3	0
	4	9.0	6.5	3.0	3.3	0
	8	6.3	6.6	5.6	3.0	0
None	0	6.1	5.3	5.3	8.3	8.0

[1] Active ingredient per acre applied at rate shown in four applications between June 6-25, July 12-16, August 1-22, and August 25-September 16 in 1962, 1963, 1964, 1965, and 1966.
[2] Ratings are average of three replications for dates shown. Scale: 0 = none, 10 = high (50 or more plants per sq. ft.).



Differences in fatness of these carcasses showed up in proportion of retail cuts and percentage steaks and roasts. The fatter carcass at left (yield grade 4.7) had 42.5% steak and roast cuts and 65.2% total retail cuts. With yield grade of 1.8, the leaner carcass had 52.9% roasts and steaks and 74.0% total retail cuts.

CARCASS DIFFERENCES *Pinpointed by* FEDERAL YIELD GRADING

D. L. HUFFMAN and J. C. COLLINS
Department of Animal Science

TODAY'S CONSUMER demands beef that is tender, flavorful, juicy, and has a minimum of waste fat. And this demand must be met for continuing success of the beef industry.

Under present grading standards, two primary factors determine desirability of a beef carcass: (1) quality grade, which reflects differences in tenderness, juiciness, and flavor; and (2) yield grade, which determines differences in edible meat from carcasses that vary in degree of fatness. Numerous studies have shown that carcass yield of retail cuts may vary from 60 to 75% within the Choice quality grade.

On June 1, 1965, U.S. Department of Agriculture adopted new yield grades for beef carcasses. These standards establish five yield grades numbered 1-5. Carcasses with the highest yield of retail cuts are classified as yield grade 1, while those having lowest yield fall in grade 5.

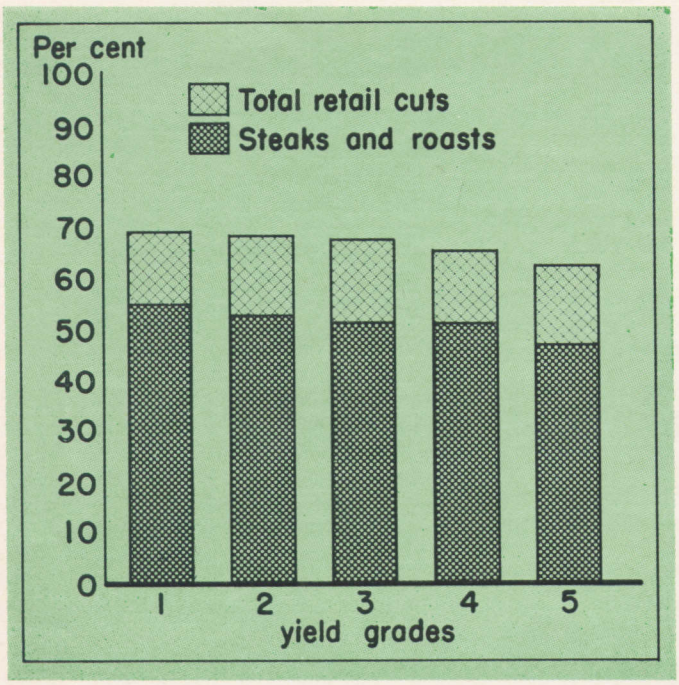
Value of the new grading system was established in an Auburn study that showed accuracy of the grades. This information was obtained by evaluating yield grades of carcasses in terms of retail cuts of beef.

Two beef carcasses, both grading Choice but differing in fatness, were yield graded and broken into trimmed retail cuts. Fat differences are shown in the photo, and specific results are given in the following table:

Yield grade	*Pct. roast and steak*	*Pct. total retail cuts*
1.8	52.9	74.0
4.7	42.5	65.2

It is apparent that total yield of retail cuts decreases as the yield grade increases. More important, however, the percentage of high priced cuts (steaks and roasts) decreases markedly in fatter carcasses.

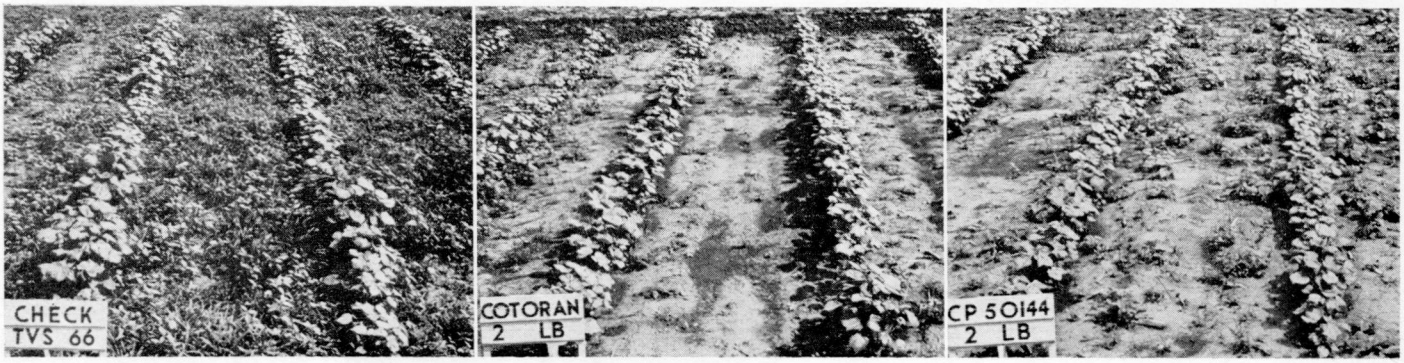
Assuming that the two test carcasses weighed 600 lb. each and cost 59¢ per lb., each would cost $354. Cost of retail cuts from the carcass with yield grade of 1.8 would be 80¢ per lb. This compares with 90¢ per lb. of retail cuts from the fatter carcass that had yield grade of 4.7. Such differences are commonly found within the top quality grades.



The chart records graphically the percentage of total retail cuts and steak and roast cuts from 50 beef carcasses representing the five yield grades. There were 4, 5, 19, 11, and 11 carcasses in yield grades 1, 2, 3, 4, and 5, respectively. Average figures show that proportion of retail cuts went from 69.6% for yield grade 1 carcasses to 63.6% for those of yield grade 5. Range for steak and roast cuts was from 54.1 to 47.8% for yield grades 1 and 5. These results show the same trends as noted with the two carcasses in the photo.

Data from the Auburn study confirm the observation that fatter carcasses have a lower percentage of retail cuts and high price cuts than leaner carcasses. It is noted from the graph that the decrease in total retail cuts is attributed to the reduction in roasts and steaks. Of the total yield from these carcasses, variable factors were percentage waste fat and percentage steaks and roasts. The difference between per cent of total retail cuts and per cent steaks and roasts, represented by hash marks on the graph bars, was relatively constant regardless of yield grade.

Data from the Auburn study reported show that federal yield grades for beef carcasses reflect real differences in carcass composition and, therefore, can be a useful tool in marketing beef carcasses.



Effectiveness of herbicides for cotton weed control is illustrated here. Untreated check plot (left) is contrasted with plots treated with 2 lb. per acre of Cotoran (center), and 2 lb. per acre of CP-50144 (right).

What is Status of Cotton Weed Control with Herbicides?

G. A. BUCHANAN, *Dept. of Agronomy and Soils*

THE NUMBER of herbicides available for weed control in cotton has increased phenomenally in recent years. This has been accompanied by an unprecedented acceptance of herbicides by farmers.

Willingness of farmers to use herbicides can be attributed mainly to increased dependability of herbicides, greater variety of weeds controlled, and an acute shortage of dependable farm labor. Use of herbicides has reached the point where a farmer no longer considers whether to use chemical weed killers; rather, he is concerned with choosing the best herbicide for his particular conditions.

Preplant Herbicides

Currently recommended for preplant-preemergence weed control in cotton are trifluralin (Treflan), a liquid, and Planavin, available as a wettable powder. Each of these materials has consistently given excellent grass control at several locations in Alabama. In addition to controlling annual grasses, these herbicides have been effective against several broadleaf weeds, such as carpetweed, Florida purslane (pusley), and pigweed. At recommended rates they have exhibited little or no herbicidal activity against other broadleaf weeds, such as prickly sida (ironweed), morning-glory, cocklebur, crotalaria, and sicklepod (coffeeweed).

Trifluralin and Planavin usually work well under both wet and dry moisture conditions. Each has given good weed control at rates of 0.5 to 1.0 lb. active material per acre (higher rate for finer textured soil) incorporated into the top 2 in. of soil. Incorporation is done with a double disk harrow or any one of several power driven incorporating devices. Application can be made up to 6 weeks ahead of planting.

Preemergence Herbicides

Three substituted urea herbicides are currently recommended for weed control in cotton. Diuron (Karmex DL) has been successfully used for many years. It is effective against most small seeded annual weeds when applied at rates of 0.8 to 1.2 lb. active material per acre. A major weakness of diuron is that moisture is necessary for herbicidal activity.

Norea (Herban) has given good control when rate was at least 3 lb. per acre. Lower rates have not consistently given satisfactory results.

Cotoran is recommended for the first time this year. Applied at rates of 1.5 to 2 lb. per acre, Cotoran has consistently controlled all annual grasses. In addition, it has been effective against such broadleaf weeds as prickly sida, morning-glory, sicklepod, and cocklebur, which are not satisfactorily controlled with trifluralin or Planavin. Cotoran provides season-long control under normal conditions.

Prometryne (Caparol) was recently included in the growing list of recommended herbicides for preemergence weed control in cotton. At rates of 2 to 3 lb. active material per acre, this herbicide has given satisfactory control of both annual grasses and broadleaf weeds. Because of the possibility of excessive leaching, prometryne should not be used on sand or loamy sand soils.

Chloro-IPC (CIPC) completes the list of herbicides currently recommended for preemergence weed control in cotton. A volatile herbicide, CIPC is more effective during cool weather than when applied during hot, dry, and windy weather. Weed control with CIPC usually is of short duration.

Experimental Herbicides

Several experimental herbicides have looked promising, as shown by the following results:

Herbicide per acre	*Percentage control*	
	Annual grass	*Broadleaf weeds*
CP-50144, 1 lb.	96	39
CP-50144, 2 lb.	97	49
CP-50144, 3 lb.	98	60
Sindone, 2 lb.	90	50
Sirmate, 6 lb.	82	87

CP-50144 has consistently controlled annual grasses and some broadleaf weeds (especially at higher rates) under a wide range of moisture conditions, and on both heavy and light soils. In several recent trials, Sirmate and Sindone were effective against annual grasses and some broadleaf weeds. However, these experimental materials have given only fair to poor control of such broadleaf weeds as prickly sida, sicklepod, and morning-glory.

Yield of cotton has not been significantly affected by any of the herbicides discussed. In many cases, yields have been higher because of better control of weeds. However, herbicides are sometimes associated with early stunting of cotton that causes plants to be smaller 3 to 5 weeks after planting. Stand reductions usually occur only when rates are higher than required for weed control. Although early stunting is often evident, cotton usually recovers by mid-season.

Eight Grade A Herds Used in Dairy Research by Auburn Experiment Station

J. H. BLACKSTONE, *Dept. of Agricultural Economics and Rural Sociology*
K. M. AUTREY, *Department of Dairy Science*

This Grade A herd at the North Auburn Dairy Research Unit is one of eight Agricultural Experiment Station research herds.

EIGHT GRADE A dairy herds are being used in research by Auburn University Agricultural Experiment Station system. Three of the herds are located at Auburn and five are at outlying units — Sand Mountain, Piedmont, Black Belt, and Gulf Coast substations, and Alexandria Experiment Field. During 1966 there were 349 milking cows in these herds. Herd size varied from 18 to 84 cows and averaged 44 per herd.

Considerable herd improvement has been accomplished in recent years by artificial breeding to outstanding proven bulls. Average production per cow in 1966 amounted to 12,425 lb. of 4% fat-corrected milk (FCM). Herd production averages varied from 8,000 to more than 15,000 lb.

During 1966 seven of the eight herds averaged more than 10,000 lb. of milk, and five averaged above 12,000 lb. These figures compare with an average of 9,400 lb. production for all Grade A herds on DHIA test in Alabama during 1966. Only 39% of the DHIA herds produced as much as 10,000 lb. and the 12,000-lb. level was reached by just 11%.

Level of milk production by Experiment Station herds is affected by experimental treatment and by the management system. Certain test treatments reduced production considerably, but such reduction is justified because the main purpose of these herds is to serve the dairy research program. Since it is important for dariymen to develop high producing herds, research is more meaningful when it is done with cows of high producing ability. Cows producing less thna 5,000 lb. of milk can maintain this level with little more feed than a low quality roughage. Cows capable of producing 10,000 to 15,000 lb. must have high quality forage and high levels of concentrate feed.

Records kept of the research herds provide valuable study information. Among the records are such items as percentage of dry days, milk fat test, feed costs per cow and per hundredweight of milk, and amount of milk produced per worker.

Three of the eight herds had 15-16% of total cow days as dry days. For the remaining five herds, the figure was 14%. Annual milk fat test averages ran from 3.7% for one herd to a high of 5.1% for a small herd of Jerseys. Overall average for all cows and all herds was 4% fat.

Feed costs per cow varied from a low of $206 to a high of $357, and averaged $284 annually. Variation in cost of feed per hundredweight of 4% FCM produced was $2.03 to $2.89, with an average of $2.29.

Income over feed cost varied from a low of $218 to a high of $491 per cow. Amount of 4% milk produced per man-year of labor varied from 183,000 to 583,000 lb. Average for all herds was 381,000 lb. Man-labor requirements varied considerably with the research program being used, but this measure is an important criterion of management efficiency.

Amount and kind of feed fed varied from herd to herd, and often within herds. Listed in the table is average feed fed per cow by herds. As as example of variations, one herd received no green grazing, while another was fed neither dry forage nor pasture.

Several herds were divided into two or more experimental groups, with each group fed differently. Some herds, or parts of herds, were entirely on drylot, while others were on conventional pasture and dry forage. For example, herd 8 was on drylot with corn silage as the only source of forage. Most of the other herds were divided into groups with different feeding systems. Grain feeding varied by herds, going from 1 lb. feed for each 2 lb. of milk to ratios of 1:3.1.

This report makes no attempt to give specific research findings. Rather, it uses basic types of DHIA data to show that high producing Grade A dairy herds are possible in all areas of the State and under all types of feeding systems.

Alabama dairymen have a wide choice of management practices and feeding systems that can be used to produce high herd averages at relatively low feed costs per hundredweight of milk produced. Feeding systems are not rigid, so they may be varied to fit individual farm conditions. Main requirements are for adequate amounts of good quality grain and forage, plus good herd management practices efficiently followed.

MILK PRODUCTION, FEEDING SYSTEMS, COSTS, AND RETURNS OF EIGHT GRADE A DAIRY HERDS, AUBURN UNIVERSITY AGRICULTURAL EXPERIMENT STATION, 1966

Herd number	Herd size, cow years	FCM per cow, av.	Feed fed per cow			Pasture		Feed costs		Income over feed cost/ cow
			Concentrates	Succulents	Dry forage	Days/ cow	NE	Per cow	Per cwt. FCM	
		Lb.	*Lb.*	*Lb.*	*Lb.*	*No.*	*Pct.*	*Dol.*	*Dol.*	*Dol.*
1	45.7	15,223	7,116	7,000	1,882	306	14	357	2.35	491
2	84.1	13,876	5,353	7,776	1,189	271	15	295	2.13	460
3	27.5	12,941	6,822	0	4,635	303	18	329	2.54	386
4	32.7	12,453	5,196	12,474	2,569	334	12	305	2.45	443
5	58.9	12,365	4,046	6,927	2,241	303	32	274	2.22	426
6	18.0	11,184	4,844	16,889	1,888	302	11	323	2.89	257
7	52.5	10,369	3,400	11,695	305	365	33	211	2.03	370
8	29.8	8,009	3,755	21,406	0	0	0	206	2.57	218
Av.	43.6	12,425	5,008	9,582	1,661	282	—	284	2.29	407

DEALERS' KNOWLEDGE *of* PESTICIDES

J. E. DUNKELBERGER and
J. L. JOHNSON, *Dept. of Agricultural Economics & Rural Sociology*

Purchasers of pesticide products for farm, home, and garden are victims of a rapidly changing technology. Many new pesticide products offered on the market each year create a problem for farm and nonfarm users.

It is virtually impossible for pesticide purchasers to keep well informed so rapid has been discovery of new control chemicals. Even farmers who regularly use pesticides in their farm operation rarely have an adequate knowledge of the different products, brands, and safety precautions; and naturally, they have little knowledge of other pesticides. Farmers are forced to rely more and more on the pesticide producers, company representatives, and retail dealers for information and instructions.

The lack of pesticide information is even more acute among nonfarm people who occasionally need and use control materials. Seldom does the nonfarm pesticide user buy large quantities of these products. Nevertheless, it is essential that what he buys **be used with caution according to recommendations for maximum safety and benefit.** To the nonfarm customer who feels lost among the maze of different products and brand names and who has little if any knowledge of pesticides, the dealer is viewed as an authority on whom he can rely.

The pesticide dealer has much the same image to the person buying pesticides as the pharmacist has to the person buying drugs for an ache or pain. Because of the pesticide dealer's familiarity and experience with these materials, he is viewed as an authority who can rapidly diagnose a pest problem and recommend the correct treatment.

Dealers' Awareness of Image

In a recent study conducted among all retail pesticide businesses in seven Alabama counties, dealers were asked about their customer image. Almost all indicated an awareness of the fact that some of their customers were considerably dependent upon them when purchasing pesticide materials. Ninety-five per cent indicated that dealers who sell pesticides are expected to be well informed about them and able to recommend materials to remedy all kinds of pest problems.

Clearly, dealers are aware of the image many pesticide customers have of them. In response to this image, most dealers (95%) felt it was the dealer's minimum obligation to always remind the customer to read the label before using pesticide materials. For some time prior to the study several concerned organizations had been stressing greater attention to labels. However, one-third also indicated they did not feel dealers went far enough to always carefully point out the toxic properties of pesticides they sell.

Additional information was available concerning the extent to which dealers were really conscious of toxicity in pesticides and of the need to caution their customers. A test of toxic awareness among dealers was made by presenting a sample container of a new pesticide product to each dealer for study. Several questions were then asked concerning the product. Less than one-third of the dealers made particular note of toxicity and only 3% could recall the nature of the toxic problem mentioned on the label. In spite of their awareness for the need to read labels, dealers themselves did not pay sufficient attention to information about toxicity.

Knowledge of Pesticides

Since many pesticide customers rely on the dealer for advice, how do dealers rate on pesticide knowledge? A test of pesticide knowledge was used consisting of 20 true-false, 6 multiple choice, and 7 open-end questions. The test was designed to measure general knowledge of pesticides rather than specific brands. The open-end questions approximated the customer-dealer relationship by asking the dealer to recommend treatments for particular pest problems.

The highest possible test score was 33 correct answers. Low scores of 1-11, medium scores of 12-17, and high scores of 18-33 each accounted for approximately one-third of the dealers. Most of the dealers had some general knowledge of pesticides, but few received scores that suggested a high level of competence regarding these materials. However, pesticide needs vary within the State and some dealers were quite knowledgeable of pest problems and treatments common to their area, but lacked a broad knowledge of pesticides.

Results of the knowledge test revealed that the more informed dealers were those who had the larger dollar volume of pesticide sales. Moreover, they were also more likely to view pesticides as an important enterprise in their total business operation. Obviously, the dealers' attitude toward pesticides and the amount of pesticide sales are related factors that determine the time and effort the dealer is willing to expend in keeping well informed about pesticide products and their uses.

The data in this study reveal considerable variation among pesticide dealers in their techincal knowledge of pesticides. Ample knowledge was particularly lacking among dealers having only a small volume of pesticide sales. However, the image held by the pesticide customer, who considers the dealer to be an "expert" on such products, is the same for all dealers regardless of business volume. Small dealers must recognize this fact and make greater effort to keep informed about pesticides.

CHANGING PATTERN of FARM EXPENSES

J. H. YEAGER, *Department of Agricultural Economics and Rural Sociology*

ALMOST A HALF-BILLION DOLLARS! That's the amount spent by Alabama farmers in 1965 as production expenses.

This was a major part of the cost of producing crops, livestock, and livestock products. It also included depreciation, taxes on farm property, interest on farm mortgage debt, and net rent to nonfarm landlords. These latter expenses are normally referred to as "fixed." They do not vary as volume of production changes.

The largest single expense item by Alabama farmers in 1965 was for feed purchased, see table. Almost one-third of all expenses or $144 million was spent for feed. In 1950, only 15 years previous, the amount spent for fertilizer and lime was the largest single item. Increases in broiler and egg production and increased emphasis on livestock production account for the rapid growth in feed expenses.

Depreciation was the second most important single expense item in 1965. Depreciation accounts for the "using up" of a farmer's capital investment in such things as machinery and equipment and farm service buildings. This expense obviously is associated with mushrooming capital investments on Alabama farms. Almost every year, records indicate that farmers increase their capital investment in machinery and equipment. This, in turn, shows up in more expenditures for repairs and operation of capital items — $57.1 million in 1965.

In 1950, expense by farmers for purchase of livestock was relatively small while in 1965 it amounted to $33.2 million. Largely because of the small base in 1950, this item showed the greatest percentage increase of any in 1965.

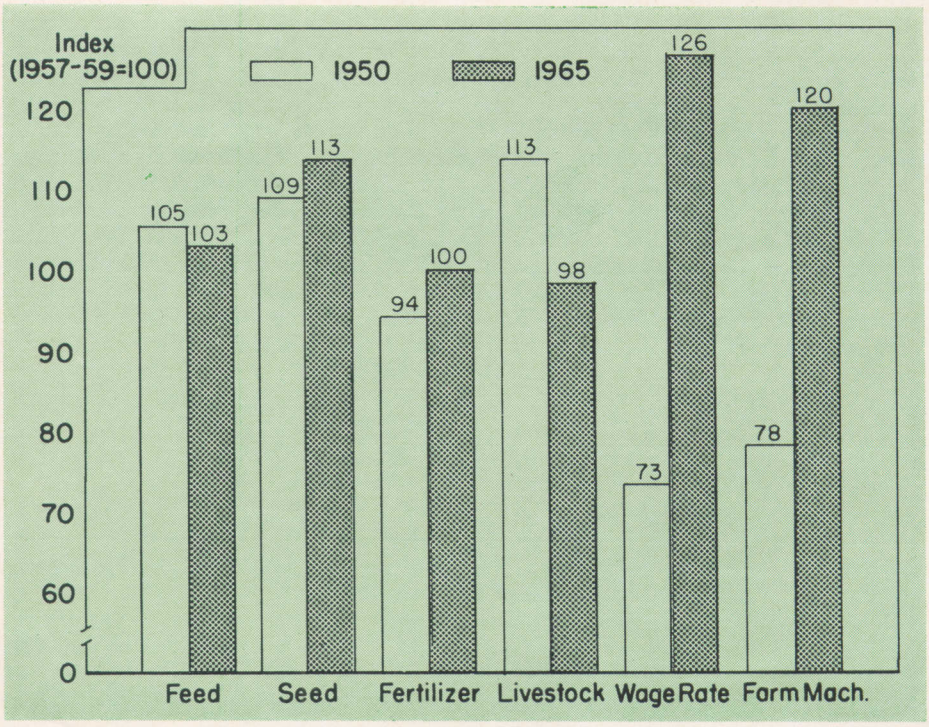
Seed was one of four items that registered a decline in amount spent by farmers from 1950 to 1965. Other expense items that declined were fertilizer and lime, hired labor, and net rent to nonfarm landlords.

Total interest paid on the mortgage debt was three times as great in 1965 as in 1950. Interest paid on short-time obligations, largely for operating expenses, is included in the miscellaneous group of expenses. Taxes paid on farm property increased 52% in 15 years or about 3¼% per year as an average.

Expenses for such items as small tools, containers, binding material, pesticides, electricity, telephone, marketing products, veterinary services, and farm insurance are included in the miscellaneous category. Several of these are sizeable although not shown separately. Alabama farmers, in 1965, spent $5.1 million for pesticides, excluding livestock sprays and disinfectants. They also spent more than $7 million for veterinary medicines and fees.

EXPENDITURES BY ALABAMA FARMERS

Item	Million dollars			
	1950	1955	1960	1965
Feed	29.5	54.2	98.0	144.0
Seed	8.3	8.9	6.9	6.7
Fertilizer and lime	51.9	41.9	43.8	42.2
Livestock	4.4	14.0	28.6	33.2
Hired labor	32.1	37.7	38.1	29.9
Repairs and operation of capital items	34.0	44.2	29.6	57.1
Depreciation	34.9	49.4	55.5	82.8
Taxes on farm property	6.0	7.0	7.2	9.1
Interest on mortgage debt	4.2	6.0	8.8	14.6
Net rent to nonfarm landlords	7.0	6.9	3.1	4.2
Miscellaneous	26.8	34.2	39.5	51.9
Total	239.1	304.4	379.1	475.7



This chart shows prices paid as production expenses by farmers throughout the United States in 1950 and 1965.

Changes in farm expenses result from changes in quantities of items (inputs) used and their unit costs. Unit costs or prices paid by farmers have also changed since 1950.

Changes presented in the chart are averages for the United States. Indexes of prices paid for specific items are not available for Alabama.

Major increases were registered for farm wage rates and farm machinery from 1950 to 1965. The fact that wage rates increased while the total spent on wages declined is an indication of the major shift on Alabama farms in substituting machinery for labor. Prices paid for livestock and feed declined from 1950 to 1965.

It is reasonable to expect that in the future costs of farming will continue to increase. As in the past, certain costs will increase more than others. Wage rates no doubt will continue to increase.

A relatively large portion of farm expenses such as depreciation, interest, and taxes are annual charges considered "fixed" for a particular year. As time passes, these increase, and if unit cost of production is to be held in line or cut, volume of production on individual farms must be increased. This points to continued forced growth in size of farms. It points to increased credit needs, financial planning, and sound management.

SELF-FEEDING A FAT-CONTAINING Mixture To Steers GRAZING COASTAL BERMUDA

R. R. HARRIS and W. B. ANTHONY, *Department of Animal Science*
V. L. BROWN, *Lower Coastal Plain Substation*

PASTURE, as a major feed ingredient, is one sure way to increase returns from a cattle finishing program.

Research at both Auburn (Alabama) and North Carolina Stations has shown this to be true. Tests at Auburn involved limited feeding of a concentrate mixture to steers grazing Coastal, whereas the North Carolina Station used clover-fescue or white clover-orchardgrass as a grazing forage.

In these studies results showed the most economical amount of supplemental grain for finishing cattle on pasture was about 1 lb. of grain per 100 lb. of body weight. The labor-saving aspect made it highly desirable to use a mixture that could be self-fed on pasture and consumed at a rate of 1% of body weight. This necessitated the addition of some material to the grain mixture to limit intake when feed was kept before animals continuously. In the North Carolina studies salt was added at the rate of 10% and was effective in controlling intake to the desired level but other factors caused it to be undesirable.

Additional energy is the principal need for finishing cattle on pasture. Fat is a concentrated form of energy. This makes its use desirable. However, when feedlot steers were fed fat at a level of 10% of the diet, their feed consumption was markedly reduced. This indicated that the addition of fat could be a means of limiting grain intake for steers fed on pasture.

Management Systems on Grazing

During 1963, 1965, and 1966 yearling beef steers weighing about 640 lb. were assigned to treatments designed to test the effect of certain management factors on animal performance. Twelve steers grazed Coastal pasture without benefit of supplement until July 15. They were then placed in drylot, and fattened on a blended mixture, Group II. A comparable group of cattle remained on grazing until September 1 and were fattened in drylot, Group I. Cattle in Group III grazing Coastal pasture were self-fed a high-energy supplement, containing fat, until sufficiently finished for slaughter. They were never fed in drylot. The control animals, Group IV, were put in drylot and full fed a high-roughage blended fattening mixture until slaughtered. Composition of the fat-containing supplement was: 80% ground shelled corn; 10% CSM; 9% stabilized animal fat; 0.5% dicalcium phosphate; and 0.5% salt. The most common blended fattening mixture contained about 58% shelled corn, 25% grass hay, 10% cane molasses, 5% cottonseed meal, 1% mineral, and 1% urea.

Animal performance data, as an average for the 3 years, are reported in the table. One surprising result was that cattle grazed the full season, until September 1, gained slightly faster than those grazed only until July 15 (1.33 vs. 1.19 lb.).

Cattle in Group III required an average of 138 days of grazing plus supplement feeding to reach slaughter condition; however, animals in I and II required a total of 199 and 155 days, respectively, to reach the same slaughter grade. All cattle graded Good-Choice except for a few animals that graded Standard in the most recent year. The quality of feeder cattle used in 1966 was not as good as that in the 2 previous years and also an error could have been made in judgment with respect to time that the cattle in Groups II and III were ready for slaughter in 1966.

Cattle in Group IV were fattened after an average of 93 days in the feedlot. These cattle had ADG of 2.71 lb. and a feed conversion of 918 lb./cwt. Feed conversion values for Groups I and II were 1,021 and 986 lb. for feedlot fattening mixtures. However, considering feed conversion on total gain basis, cattle in Groups I and II showed conversions of 537 and 662 lb. per cwt. of gain, respectively. All groups, I, II, and III, had access to pasture that was not considered in calculating feed conversions on the basis of total gain. Cattle receiving the HE "fat" supplement required 531 lb. of supplement per cwt. of gain. On the average, they ate 10 lb. of the supplement daily or 1.3% of their body weight. Feed consumption data reported in the table for Groups I and II are for the drylot fattening period only and that shown for Group III is for supplement only. Grazed forage was in addition to feed shown.

Limit-feeding did reduce the harvested feed required per animal (1,380 vs. 1,910; 1,893; and 2,307 lb.; Groups I-IV in order) but the feed cost, excluding pasture, per steer was about $50 for all groups. Returns to pasture, labor, and management were $31.89, $20.65, $24.08, and $8.11 for Groups I-IV, respectively.

Appraisal of Results

The practice of limit-feeding supplement to cattle grazing well-fertilized Coastal pastures has merit. Data collected from the study reported here, indicate that the inclusion of 9% stabilized animal fat in a supplement will effectively control intake of the supplement to about 1.5% of body weight, even though cattle have access to it continuously. "Managed grazing" of Coastal may not result in improved animal performance. Results to date are conflicting, thus more research is needed.

Yearling steers placed directly into the feedlot and full fed high roughage blended fattening mixtures consistently gain 2.5 lb. daily and are finished for slaughter in about 90 days. These cattle also generally make efficient feed conversion. However, since the feed cost per unit of gain is relatively high, the opportunity for profit is normally less than that of the other 3 systems tested.

ANIMAL PERFORMANCE DATA—3-YEAR AVERAGE

Item	Group I grazed C.B. to 9/1 then feedlot	Group II grazed C.B. to 7/15 then feedlot	Group III fed HE mix w/fat on C.B.	Group IV fed in drylot
Initial wt., lb.	638	640	640	639
Begin. feedlot wt., lb.	807	734	-----	-----
Final feedlot wt., lb.	994	936	900	891
Days grazed	127	79	138	-----
ADG grazing	1.33	1.19	1.88	-----
Days in feedlot	72	76	-----	93
Feedlot ADG	2.60	2.53	-----	2.71
Feed cost/cwt. gain, $	26.54	25.58	17.84	23.66
Daily feed eaten, lb.	26.7	24.9	10.0	24.9
Feed/cwt. gain, lb.	1,021	986	531	918

RUTH A. HAMMETT
Department of Agricultural Economics and Rural Sociology

CONSUMERS

need marketing information

TOO!

AT LEAST ONE PERSON in every Alabama town or city family has the responbility of spending that part of the income set aside for food!

Usually that person is the homemaker, who considers it part of her job to plan, purchase, and prepare food for the family meals. Whatever her proficiency, she manages the family's food money.

Food buying decisions are never made under exactly the same conditions. The quantities of food purchased are directly influenced by per capita income and educational level of the homemaker. Other influences are stage in the family cycle, size of family, age and sex of family members, and amount of entertaining that is done. A change in income, in family size, health, or even housing may cause drastic revisions in buying habits. The satisfied homemaker of 3 years ago who looked upon a trip to the grocery store as an enjoyable occasion is now an unhappy shopper because of higher food prices. The picket lines and the boycotts of 1966 did not lower prices, but is was a sign that consumer attitudes were changing.

Few homemakers have formal training in food purchasing. Most depend on childhood memories, influence of parents, trial and error, and an unorganized accumulation of information. For most situations the homemaker considers her own experience or cookbooks sufficient marketing aids.

To be a skilled manager requires decisions based on knowledge of other possibilities from which the most suitable or advantageous is chosen. Much specific and general information is available to producers, processors, wholesalers, and food retailers for making decisions. These people have similar interests, whereas the only characteristic many homemakers have in common is that they buy food for family use. Providing food information, therefore, involves selection of suitable methods of reaching certain types of homemakers if it is to be effective.

A recent food marketing study is concerned with response of urban homemakers to 3-week educational programs in newspapers, on radio, and in retail food stores. In each media, themes were the nutritional value, purchase, and preparation of broilers. In the retail food stores survey, 27% mentioned the themes, although 42% of the sample remembered seeing the display; 17% of the newspaper sample and 8% of the radio sample could recall identifying items.

In each case, awareness of the educational material, and ability to mention more than one item increased as per capita income or educational level of the homemakers increased. These family characteristics were also related to increase in nutritional or marketing knowledge, reading a daily newspaper, reading all parts of the newspaper, and use of new recipes. The most responsive homemakers were those between 35 and 44 years old, those with per capita incomes of more than $1,800, and those having 12 or more years of education.

While 42% of the homemakers in part of the survey said they were satisfied with their food buying ability, 80% listed one or more sources from which they would like to get information. For most homemakers, newspapers were the preferred source of information because they could be read at leisure and clipped for future use. A spot check of the food section of several newspapers showed that more than half the space was used for prices. Of the remaining space, 12% was devoted to stamp coupons and consumer lures such as prizes, about 7% to recipes, and 0 to 5% to food articles. Other space was occupied by nonfood advertising and single food advertisements.

Homemakers said they would like to see more news in the food section about seasonal foods, preparation methods, balanced menu suggestions, and usable recipes. The food advertisements could devote more space to identification of "specials" by size, brand, and regular price. Many noted that the same foods were advertised every week, and were often foods they did not use.

Radio is depended on for news and music, but repeated 1-minute taped broadcasts of food information might reach certain groups effectively. For homemakers at the lowest socioeconomic level, personal approach through existing agencies may be the best answer. Displays could be used more effectively in helping homemakers with food choices in the store.

Much research needs to be done in what constitutes good consumership, and how to educate consumers when the information is most acceptable. Effective communication will require adjustment in the homemaker viewpoint and improvement of educational methods by the expert.

If consumers are to be an effective part of the marketing system, they must be willing (1) to spend the time and effort necessary to get the most for their food dollar, (2) to understand enough about the nutritive values of the food groups to provide their families with the "balanced meals" they say is their goal, and (3) to remove nonfood items from the checkout tape before complaining about the size of the food bill.

SOIL CALCIUM *and* ROOT GROWTH

FRED ADAMS, *Dept. of Agronomy and Soils*

CALCIUM DEFICIENCY has a devastating effect on root growth. It is the only nutrient deficiency that affects the root system of a plant before it affects the top portion. In fact, there is no root growth if calcium is not available in the immediate root surroundings. This applies both to surface soils, which can be fertilized easily with calcium, and to subsoils, which are difficult to fertilize.

Calcium in Subsoil

Because of the special effect calcium has on root growth, research was done at Auburn to determine if calcium deficiency was the reason that roots failed to grow in strongly acid subsoils.

There are several reasons why root growth in subsoils needed to be studied. (1) A vigorous, healthy plant requires a vigorous, growing root system. (2) Water and nutrients stored in the subsoil are not accessible to the crop unless roots grow into the subsoil. (3) Calcium cannot be added to subsoils as easily as to surface soils. (4) Calcium absorbed from the surface soil by roots cannot move downward within the root system to the subsoil. (5) Root growth in subsoils is dependent on amount of available calcium in the subsoil, regardless of level in surface soil.

Since soil pH and available calcium are intimately associated in natural soils, special experiments were requried to separate the different effects of pH and calcium on root growth. Two strongly acid subsoils, in which roots failed to grow, were collected and used in controlled-environment studies with cotton seedlings.

Amounts of available calcium necessary to support normal root growth in the two subsoils differed greatly. No more than 80 lb. per acre of available calcium was needed in a Norfolk sandy loam, but the Dickson silt loam required at least 400 lb. per acre. In addition to level of calcium, availability of calcium was also dependent on availability of magnesium, potassium, and ammonium. Levels of these were considered together with calcium, and it was found that root growth occurred in both soils when calcium made up at least 15% of the combined total of all four nutrients.

Analyses of several strongly acid, unfertilized subsoils showed that available calcium constituted 20-30% of the four plant nutrients that affected calcium availability. Therefore, the inhibited root growth observed in these acid subsoils was not caused by calcium deficiency; it was shown by subsequent experiments to be caused by toxic amounts of soluble aluminum. Thus, the problem in acid subsoils is not calcium deficiency but low pH.

EFFECT OF AMMONIUM PHOSPHATE FERTILIZER ON EARLY ROOT GROWTH OF COTTON SEEDLINGS IN A LAKELAND LOAMY SAND

Phosphorus rate/acre, lb.	Calcium added		Relative root growth
	Gypsum	Lime	
0	no	no	100
200	no	no	16[1]
200	yes	no	85
200	no	yes	72
200	yes	yes	105
400	no	no	9[1]
400	yes	no	70
400	no	yes	23[1]
400	yes	yes	75

[1] Roots died in less than 2 days.

Surface Soil Conditions Different

Conditions are different in surface soils, and calcium deficiency may be a problem when these soils are well fertilized. Use of certain fertilizers will sharply lower the availability of soil calcium.

A result of the emphasis on high analysis, water-soluble fertilizers is that calcium-containing superphosphate is no longer being added to many soils as part of mixed fertilizers. Instead, ammonium phosphate has become a major component of high analysis, complete fertilizers.

Recent experiments at Auburn have shown that ammonium phosphate can have a highly detrimental effect on young seedlings as a result of calcium deficiency (see photo). Data in the table show that calcium deficiency did not exist in the soil before addition of ammonium phosphate. It resulted from a chemical reaction between fertilizer and soil.

Early root growth was normal in the unfertilized soil, but roots were killed as they grew into soil fertilized with ammonium phosphate. At the lower fertilizer rate, addition of gypsum (calcium sulfate) or lime to the soil allowed roots to grow normally but slightly slower. Gypsum and lime together completely counteracted the detrimental effects of ammonium phosphate. Thus, a good liming program is especially needed where high analysis fertilizers are used.

Results of the Auburn tests establish that calcium deficiency may be a problem in fertilized, acid surface soils, but not in unfertilized, acid subsoils.

Skips in rows of this cotton plot are typical of stand damage that occurs when roots come into contact with ammonium phosphate. Since ammonium phosphate is widely used in fertilizers, correct liming is needed to prevent stand loss.

These plots illustrate how planting methods and fertilization affect sericea stands: (1) seed broadcast, no fertilizer used; (2) seed broadcast, fertilizer banded; (3) seed drilled, no fertilizer used; and (4) seed drilled, fertilizer banded.

Broadcast Seed for Best Sericea Stands

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E. D. DONNELLY, *Dept. of Agronomy and Soils*
C. W. GANTT, *Agricultural Engineering Research Division, USDA, ARS*

GOOD STANDS of sericea are often hard to get. But Auburn research has shown that better stands can be obtained by broadcast seeding than by planting in the drill. In addition, broadcasting results in plants with smaller stems.

The 3-year sericea experiment was done at the Tuskegee Experiment Field to determine how seed and fertilizer placement and fertilizer levels affect stands and growth of two varieties of sericea lespedeza. Precise seed and fertilizer placement and fertilizer rates were obtained by using the Model 54 experimental grassland drill developed by USDA Agricultural Engineering Laboratory, Beltsville, Maryland.

Commercial sericea and a synthetic variety much like Serala were seeded each test year, about April 10, at the rate of 30 lb. seed per acre. Seeding was either broadcast or in 8-in. drills in combinations with different rates of fertilizer. Fertilizer was either broadcast or banded 1 in. below the seed.

Seed planted in the drill were covered ¼ in. deep, while broadcast seed were covered with a cultipacker. Fertilizer rates used were none, 250, and 500 lb. per acre of 0-16-8. Stands and tillering were recorded during the seeding year and harvest year. Yields consisted of two cuts for hay in 1958 and again in 1959. Only one hay harvest was made in 1960 because of a severe local drought.

The two varieties responded alike to the various treatments. However, the synthetic variety tillered more profusely than commercial sericea under all conditions. Yield was increased by fertilizer, but there was no difference between the two rates tried. Stands and tillering were not greatly affected by fertilizer placement or rates.

Sericea stands, tillering, and yield were better – either with or without fertilizer – when seed were broadcast and packed with a roller than when seeded in drill rows and packed. With many other forage crops, drilling and packing gives superior stands, particularly under droughty or other adverse conditions.

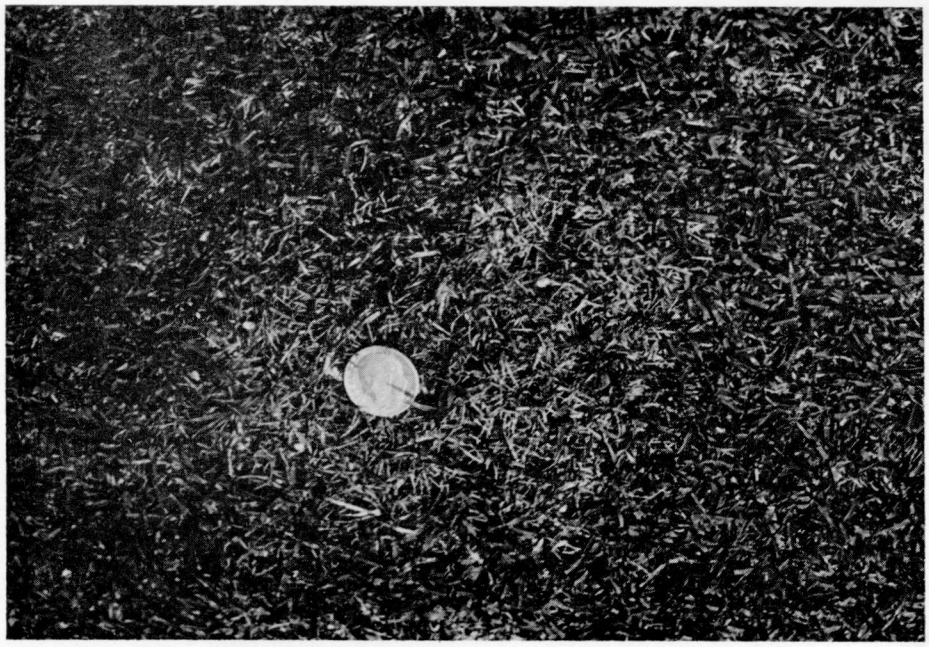
Often forage plants will partially compensate for thin stands by profuse tillering. In these experiments, total number of tillers per square foot or per acre was greater from the broadcast seedings. Broadcasting also resulted in the greatest number of plants per acre.

In addition to better stands, it is believed that broadcast seeding of sericea will also improve quality because of the greater number of fine stems.

STAND, PRODUCTION, AND STEM SIZE OF BROADCAST AND DRILLED SERICEA, FIRST HARVEST YEAR[1], TUSKEGEE EXPERIMENT FIELD

Treatment	Dry forage/acre			Plants/sq. ft.			Stems/sq. ft.[2]		
	1958	1959	1960	1958	1959	1960	1958	1959	1960
	Tons	*Tons*	*Tons*	*No.*	*No.*	*No.*	*No.*	*No.*	*No.*
Fertilized									
Broadcast	2.50	3.00	0.79	25	15	25	69	56	54
Drilled	2.35	1.98	0.67	14	9	16	54	40	42
Not fertilized									
Broadcast	2.20	2.73	0.67	23	18	24	62	64	50
Drilled	2.01	1.49	0.60	12	10	18	50	44	44

[1] Seeded the year before forage was measured.
[2] Second growth.



This lawn of St. Augustinegrass shows fading out caused by parasitic fungi.

LAWN GRASS DISEASE CONTROL

J. A. LYLE, *Department of Botany and Plant Pathology*

DISEASE CONTROL is an absolute necessity with most turfgrasses in a well-balanced lawn grass management program.

This is true since such grasses grown under artificial conditions are more subject to attack by disease organisms than in a natural environment. Properly managed healthy, vigorously growing and adapted lawn grasses can best survive attack by disease-causing organisms.

Parasitic fungi cause most of the serious and widespread diseases of lawn grasses in the South as well as other regions of the United States. In fact, more than 75 diseases of turfgrasses are caused by parasitic fungi. Such organisms cause brown patch, cottony blight and grease spot, dollar spot, fading out and melting out, gray leafspot, powdery mildew, rust, and smut. In addition, fairy rings (mushrooms) and slime molds that occur on turfgrasses are fungi. Diagnoses of lawn disorders during 1960-65 made in the Department of Botany and Plant Pathology, Auburn University Agricultural Experiment Station, showed the following causes by per cent: fungi, 62%; nematodes, 18%; insect damage, 4%; algae, 1%; and non-parasitic and non-fungus, 15%. The damage resulting from attack by the brown patch fungus on a fine lawn grass is shown in the photograph. All such disease-causing organisms can be controlled by using a recommended pesticide listed in the table.

Nematodes

Plant parasitic nematodes are now recognized also as causal agents of turfgrass disease; some 50 species are known to parasitize lawn grasses. They enter and feed on small feeder roots causing extensive injury. Roots injured by nematodes cannot absorb enough minerals and water from the soil to support the plant. Grass may become stunted, turn yellow and thin out. Affected lawns seem to lack fertilizer. To be pathogenic to grasses, as evidenced by symptoms or signs, nematodes must not only feed on root systems, but also increase in numbers sufficient to initiate an extremely high incidence of feeding sites.

Non-Parasitic and Non-Fungus Diseases

Non-parasitic and non-fungus diseases associated with turfgrasses include fertilizer burn, pesticide injury, hydrated lime burn, improper mowing and watering, compacted soils, buried debris, and accumulation of runners. Such situations are mistaken frequently for damage by fungi and other causal agents. Through exclusion of light, algae and mosses may cause some damage to lawn grasses. Proper and careful management practices are the preventatives for this kind of damage.

Disease Diagnosis and Control

The most important part of a successful lawn grass disease control program is an early and accurate diagnosis. If the initial diagnosis is incorrect, the entire program may result in loss of all, or a portion, of a stand; even though control measures of a sort were being attempted. Treating symptoms, rather than causes, is one of the main reasons for reported failures in lawn grass disease control. Spraying a lawn with a fungicide to control weakly parasitic or saprophytic fungi may be of some benefit; however, if the primary cause happens to be a high population of pathogenic nematodes feeding on the roots, this treatment will not permit the grass to grow back to the desired condition. Each time a new disease occurs, every effort should be made to determine the initial or primary cause and then recommended remedial practices should be followed. It is unlikely that the disease will vanish or not occur again. Fortunately, most lawn diseases can be controlled through proper use of a pesticide.

PESTICIDES USED IN CONTROL OF LAWN GRASS DISEASES

Disease	Pesticides
Brown Patch	Acti-dione Thiram, Dyrene (50%) WP, Maneb (80%) WP, Ortho Lawn Disease Control, Ortho Lawn and Turf Fungicide, PSMA (phenylmercury), Scutl, Terraclor (75%) WP, Tersan O M or Tersan 75, and Terraclor (20%) Dust.
Dollar Spot	Any fungicide recommended for Brown Patch, except Terraclor.
Gray Leafspot	Captan (50%) WP, PSMA (Phenylmercury), Tersan O M, and Zineb (65%) WP.
Melting-Out	Any fungicide recommended for Brown Patch and Gray Leafspot, except Terraclor.
Fairy Ring	Calo-Clor, and PSMA (phenylmercury). (Punch holes 6 to 8 in. deep outside of ring and throughout infested areas. Fill holes with recommended fungicide.)
Slime Mold	Captan (50%) WP, Maneb (90%) WP, and Zineb (65%) WP.
Nematodes	Nemagon (50%) EC, Fumazone, 70 E, and VC-13.

Index to Articles Published in

HIGHLIGHTS of Agricultural Research

1966

DEMAND for Highlights of Agricultural Research continues to increase but at a stepped up rate. To Alabama farm families receiving the research quarterly but who do not save or file, it is suggested that you pass your copies on to interested neighbor farmers.

To those of you who save Highlights but need missing copies, back issues are available dating from spring, 1960. For fill-in copies, write the Editor, 110 Comer Hall, Auburn University, Auburn, Ala., 36830. Listed below are the articles by titles published in last year's four issues.

Animal Science

DO SUPPLEMENTS INCREASE UTILIZATION OF COASTAL PASTURES BY BEEF STEERS?—Harris, Anthony, and Brown. Vol. 13, No. 1. 1966.

FEEDLOT STEER FATTENING IN GULF COAST AREA—Harris, Yates, and Barrett. Vol. 13, No. 4. 1966.

FINISHING SPRING-BORN LAMBS IN DRYLOT—Wiggins. Vol. 13, No. 2. 1966.

RYE-CLOVER PASTURE FOR GROWING SLAUGHTER CATTLE—Anthony and Starling. Vol. 13, No. 3. 1966.

YOUNG FAT BULLS ARE PROFITABLE FOR SLAUGHTER—Anthony and Starling. Vol. 13, No. 4. 1966.

Consumer Economics

CONSUMER DEMAND FOR PASTEURIZED-REFRIGERATED PEACHES—Miller and Harris. Vol. 13, No. 2. 1966.

Dairy Science

CAN COASTAL MANAGEMENT AFFECT PRODUCTION?—Rollins. Vol. 13, No. 2. 1966.

MANAGING SORGHUM SUDAN HYBRIDS FOR BEST DAIRY COW PASTURE—Little, Hawkins, Smith, and Grimes. Vol. 13, No. 1. 1966.

SPINNING QUALITY OF ALABAMA COTTON—Hurst. Vol. 13, No. 3. 1966.

THE ALABAMA SLAUGHTER CATTLE INDUSTRY—Danner. Vol. 13, No. 1. 1966.

THE FARM REAL ESTATE MARKET—Yeager. Vol. 13, No. 2. 1966.

WHERE DO LOCAL DEALERS GET PESTICIDE INFORMATION?—Johnson and Dunkelberger. Vol. 13, No. 2. 1966.

Farm Machinery

FACTORS AFFECTING NOZZLE ORIFICE WEAR—Dumas. Vol. 13, No. 4. 1966.

THE CASE AGAINST LOW GROWING BOLLS—Corley. Vol. 13, No. 2. 1966.

Field Crops

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ATKINSON

A New Tomato Variety

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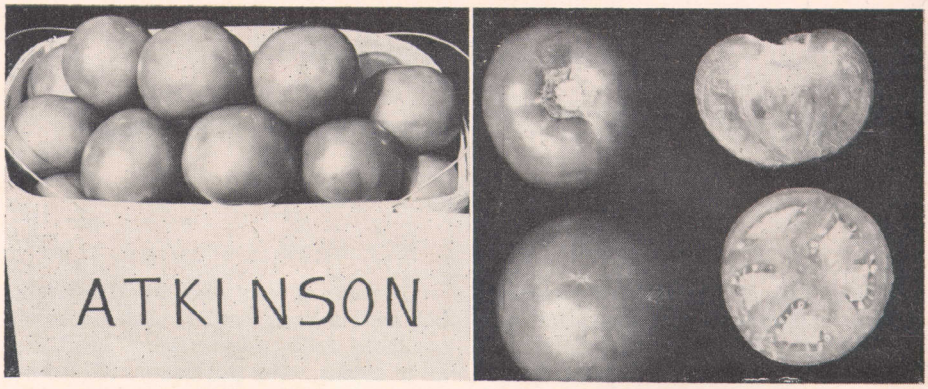

At left is a basket of Atkinson tomatoes. Fruit at right shows absence of disease damage and firm meaty flesh with small core.

A DREAM COME TRUE for tomato fanciers could describe the development of Atkinson, a new rootknot nematode and Fusarium wilt resistant tomato variety, probably the first in the Rutgers class to be released to the public.

This variety is the result of 18 years of breeding research in the Department of Horticulture. It is named for George F. Atkinson a former staff member of the Alabama Agricultural Experiment Station who first described the life cycle of the rootknot nematode at Auburn in 1889. The Atkinson tomato has a complex heritage, involving a wild Peruvian tomato resistant to rootknot and old established varieties and breeders' lines of Rutgers type selected from the Southern Tomato Exchange Program (STEP) trials.

Desirable Variety

The Atkinson, formerly called AU 22, has several desirable features. It has a vigorous, indeterminate vine with heavy stems and foliage of average density. Its fruit is larger than that of most varieties, weighing up to 1.1 lb., averaging 3/10 to ½ lb. The shape is deep oblate the flesh firm and meaty and the cor small. The immature fruit color is gree with a yellow cast. The shoulder is darker green but colors evenly on riper ing. The internal color is better than tha of Homestead 24 with little or no ligh colored fibers around the seeds. The eat ing quality of Atkinson is very good. I a comparison with Homestead 24 o seven quality factors Atkinson compare favorably, see table.

Atkinson is several days earlier tha Rutgers and about as early as Home stead 24. The yield is usually better tha that of Rutgers, approaching that o Homestead 24 when unstaked, but prob ably superior when staked. Atkinso could be expected to produce superio yields in heavily nematode infested soi

Atkinson resembles the variety Marior It was reported among the best tomatoes in the 1966 STEP observational trial at Charleston, South Carolina, as STEP 500. It also rated high when grown for the fresh market and for green wraps in the Dothan area in both the spring of 1965 and 1966.

Disease Resistances

The new variety is resistant to the southern rootknot nematode and to the cotton rootknot nematode. The foliage is moderately resistant to early blight, and resistant to gray leafspot and to Septoria leafspot on the basis of field observations. Foliage retention of Atkinson in the field is better than on most varieties, including Rutgers and Homestead 24.

Weaknesses

Atkinson is moderately susceptible to fruit cracking and catfacing.

Seed Availability

Seed of the Atkinson variety can be purchased through Robert Loe, Alabama Crop Improvement Association, Duncan Hall, Auburn University, Auburn, Alabama 36830.

COMPARISON OF SEVEN FRUIT QUALITY FACTORS OF ATKINSON AND OF HOMESTEAD 24[1]

Variety	Total solids	Soluble solids	pH	Total acidity (citric)	Ascorbic acid mg./100g.	Flavor	Color
	%	%		%	mg.		
Homestead 24	6.8	5.9	4.3	.56	22.5	7.2	7.6
Atkinson	7.4	6.2	4.6	.51	21.0	8.0	8.3

[1] Flavor and color were rated on 1 (poorest) to 10 (best) scale. Each figure is an average of four ratings. Data were furnished by Hubert Harris, Kenneth S. Rymal and J. G. Kaffezakis, Department of Horticulture, Auburn University.