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In this issue . . .

On the cover. Seed processing is a necessary part of the overall job of the Foundation Seed Stocks Farm at Thorsby. This unit produces foundation seed for cotton, corn, and other grain and forage crops for planting by growers of certified seed in Alabama. Seed processing facilities shown are housed in the unit's new storage and processing building that was completed in 1960. For a brief history and description of work of the Seed Stocks Farm, a field unit of Auburn University Agricultural Experiment Station, see page 16.

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New and Timely PUBLICATIONS

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

Bul. 326. Corn Earworm Control.

Bul. 332. Management of Irrigated Cotton.

Bul. 337. Nitrogen and Moisture Requirements of Coastal Bermuda and Pensacola Bahia.

Bul. 350. Seasonal Variations in Prices of Selected Farm Commodities.

Bul. 351. Hog and Pork Movements in Alabama.

Cir. 126. Using Low-Volume Farm Sprayers.

Cir. 127. Mechanized Cotton Production in Alabama.

Cir. 146. Precision Irrigation with Solar Energy.

Cir. 147. Diseases of Small Grains in Alabama.

Prog. Rept. 86. Performance of Sorghum Silage Varieties.

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

Better SOIL SAMPLING for ROOT-KNOT NEMATODES

R. E. MOTSINGER and E. J. CAIRNS
Department of Botany and Plant Pathology

Nematologist is collecting a soil sample from a row of a previous crop. An auger and plastic bag are the only equipment needed.

WHERE, WHEN, AND HOW deep should soil samples be taken to best determine root-knot nematode population levels of an area? Do severe winters diminish or eliminate root-knot nematodes from Alabama soils? These are questions for which nematologists at Auburn Agricultural Experiment Station, have been seeking answers.

Since, in many cases, recommendations for control measures must be made in advance of planting on the basis of soil samples sent to the laboratory, taking more representative samples in the field is very important.

Where to Sample

The distribution of root-knot nematodes around individual okra plants was studied at the Station by taking 36 single-core samples to a depth of 9 in. at bi-monthly intervals. This was continued for 14 months with a different set of 4 plants being sampled at each bi-monthly period. It was necessary to sample a different set of plants each time because taking 36 cores per plant removed much of the soil and plant roots.

Results indicated that taking cores in the region of maximum root development is preferred. The samples obtained from within a 2-in. radius of the stem usually contained a higher number of larvae with less variability between cores than that found at greater distance from the plant.

At each sampling period the root-knot larval population varied greatly from plant to plant. The distribution of the larvae around individual plants was quite variable also. Frequently the larvae were concentrated in sectors about the plants, apparently coinciding with the pattern of root development. The variability between nematode numbers recovered from adjacent cores was often great. The variability in the root-knot nematode distribution pattern around individual plants and the difference in total numbers between plants necessitates that a large number of cores within a 2-in. radius of the stems be taken from numerous plants in the area and composited.

When to Sample

The multiple-core sampling results indicated that sampling may be done anytime from near maturity of plants until just prior to planting another crop. Probably the best time to sample, when long season summer crops are grown, is from early September to early December. The population level is highest at that time.

In the spring, when a crop is planted, root-knot larvae soon enter the root system of susceptible plants and begin to develop. Larvae cannot be detected by soil sampling at that time because they are within the roots. Under the cool conditions of soil in early spring the nematodes do not complete a life cycle very rapidly. Therefore, it may be mid- to late summer before the population builds up to a high level.

By taking soil samples in the fall when the population is highest, larvae are more easily detected in the soil. When necessary, root-knot species can be identified by examination of the females in the galled roots. Another advantage is that there is time to incorporate recommended nematode control practices into the management plans prior to spring planting.

How Deep to Sample

In a study of depth distribution of root-knot nematodes a concentric circular pattern was used for sampling around 10 okra plants so that 4 cores, equidistant from the plants, could be taken for a composite sample at each date from October through April. Samples were taken at 3-in. intervals down to a depth of 18 in.

It was found that samples taken to a depth of 9 in. in the root zone included the regions of largest infestation for all months of the test. The region of largest infestation and the depth distribution of root-knot nematodes may vary depending on the soil texture and the growth habit of the particular plant root system. However, for most annual crop plants, samples taken to a depth of 9 in. should include the areas of maximum root-knot nematode concentration.

Low Temperature Effects

Daily a.m. and p.m. soil temperatures were taken at 3-in. depth intervals down to 18 in. during the winter of 1962-63, when the lowest temperatures in Auburn since 1896 were recorded. The root-knot nematode population was eliminated in the top 3 in. and reduced to very low numbers in the 3- to 6-in. depth. Below 6 in. the low temperature appeared to have no effect on the root-knot nematode numbers. There was apparently no significant downward movement of the nematodes in response to colder temperatures nor any upward movement in response to warmer temperatures in the spring.

Recommendations for root-knot nematode control depend upon having samples that represent the area in question just as for soil fertility. Properly collecting samples and sending them to the Nematology Laboratory, Department of Botany and Plant Pathology, Auburn University Agricultural Experiment Station, Auburn, Ala., will assure growers more accurate analyses being made.

DEPRECIATION—
a hidden farm cost

J. H. YEAGER,
Department of Agricultural Economics

YOU DON'T PAY cash for depreciation each year. Yet, when a new machine wears out or is out of date and must be replaced, the cash cost of depreciation becomes real.

Depreciation is a decline in value of an item during its useful life. It is an expense just as feed, fertilizer, and seed. It must be deducted from receipts to get net income. Depreciation occurs because of deterioration associated with use, age, weather, extent of protection, and upkeep. Although an item is kept in good repair, it still depreciates.

Usually considered a part of depreciation is the process of becoming obsolete. The rapid advances in technology mean that new or improved machines are more efficient. They generally cost more than the old machines. The demand for new machines tends to lower the value of old machines. Often the cost of a new machine does not equal total depreciation allowed on the old one. This is a major argument for speed-up of depreciation.

Items That Depreciate

Not all items that farmers use in production of crops and livestock are depreciable. Land is not subject to depreciation. Tractors, machinery, barns, fences, orchards, and purchased breeding livestock are subject to depreciation. Under tax regulations, raised breeding stock are not depreciable since the cost of raising them is deducted each year.

Tenant houses can be depreciated. However, the farm operator's dwelling cannot be depreciated since this is a personal and not a farm business expense.

Useful Life

Items subject to depreciation must have a definite useful life and be used in production of income. Useful life of a given item will vary among farmers. A farmer with a large acreage of cash crops will use a tractor more hours each year than a farmer with a small acreage of cash crops. Thus the useful life of a tractor would be less in the former case.

Useful life of a used item purchased is normally shorter than that for a new item. New guidelines of service life for depreciable items have recently been prescribed by the Internal Revenue Service. Under certain circumstances farmers may use a new life, shorter or longer one, in computing a reasonable depreciation allowance.

Methods

The method used in computing depreciation affects the amount of depreciation in any year. The straight line method is a simple one that gives the same amount of depreciation each year during the useful life of the item. (See table.) By this method salvage value must be deducted from cost prior to dividing by the years of useful life to get annual depreciation.

A second method is the declining balance. In this case salvage value is not deducted prior to figuring depreciation. The percentage rate of depreciation is multiplied by the cost. This gives the first year's depreciation. To get the second year's depreciation, the amount of depreciation for the first year is subtracted from the cost to give a balance. This balance is multiplied by the percentage rate. A 5-year useful life means a 20% rate.

Any rate not in excess of twice the straight line rate may be used on property having a useful life of 3 years or more. The property must have been acquired new, constructed, reconstructed, or erected after December 31, 1953.

A third way of computing depreciation is by the sum of the years-digits method. Use of this method is limited to property that meets requirements for the declining balance method with twice the straight line rate.

With the digits method for a 5-year life, the sum 1 + 2 + 3 + 4 + 5 is 15. In the first year 5/15 or 1/3 of the cost less salvage value gives the depreciation. For the second year, 4/15 of the cost less salvage value gives the allowable depreciation. In 5 years all of the allowable depreciation will be recovered.

More Depreciation

The last two methods of depreciation allow a larger amount of depreciation in the first than in the later years. This is more nearly in line with actual depreciation based on market value of most items. Tax regulations also provide other ways for taking additional depreciation.

It may or may not be to a farmer's advantage to take more depreciation in one year compared with another. In years of high income, it is advantageous to have more depreciation in order to reduce tax. Probable changes in income should be considered in selecting depreciation methods and policies. Also, probable changes in tax rates are a factor.

Depreciation is an important hidden farm cost. As more machinery, equipment, livestock, and facilities are required, farmers will face an increasing number of depreciation decisions that affect their pocketbook.

COMPARISON OF ANNUAL DEPRECIATION FOR ITEM COSTING $2,100 WITH A SALVAGE VALUE OF $100 AND A USEFUL LIFE OF 5 YEARS

Year	Annual depreciation		
	Straight line (20%)	Declining balance (40%)	Sum of the years-digits
1	$ 400	$ 840.00	$ 666.67
2	400	504.00	533.33
3	400	302.40	400.00
4	400	181.44	266.67
5	400	108.86	133.33
Total	$2,000	$1,936.70	$2,000.00
Salvage value or unrecovered cost	$ 100	$ 163.30*	$ 100.00

* If item is not retired at end of 5th year, depreciation may still be computed at 40% of unrecovered cost until salvage value of $100 is reached.

TOKUJI FURUTA, BILL MARTIN,
and FRED PERRY
Department of Horticulture

Fertilizing and Irrigating at the same time

DOING TWO THINGS at once doesn't always lead to confusion.

Combining separate but essential operations is a way commercial growers reduce production costs, and homeowners reduce to a minimum the efforts necessary for attractive landscapes. Combining the tasks of water and fertilizer applications will meet these requirements.

In addition to reducing costs or effort, other advantages include: more even distribution of small amounts of fertilizer, quick and rapid change or manipulation of the amount or type of nutrient applied according to plant needs, and generally less likelihood of injury from overfertilization. Single or many elements may be applied together.

Procedures Developed

Several procedures have been developed and tested at the Auburn University Agricultural Experiment Station for effective and efficient use. The main procedures are: (1) periodic applications of fertilizers, often called "liquid fertilization"; and (2) application of fertilizer with each irrigation, usually called "constant fertilization." A relatively strong fertilizer solution is used for periodic or liquid fertilization with only water between, whereas an extremely dilute solution is used for constant fertilization. Usually more elaborate equipment will be necessary for the successful use of constant fertilization, but the advantages are that it is automatic, there is no danger of a temporary oversupply of fertilizer, and fertilizer supply is proportional to plant growth and nutrient use.

The gloxinia plants above were grown under constant fertilization practice.

Equipment Needed

Suitable equipment for fertilization and irrigation at the same time range from simple pumps to siphoning devices to metering pumps. Each has a use. Pumps may be used where fertilizer is dissolved in water at the proper concentration, and the solution is then pumped to the place of application. This procedure is used with periodic or liquid fertilization.

Siphoning devices are constructed to introduce a concentrated fertilizer solution into irrigation water. These devices may be small attachments that fit on garden hoses, or large devices to fit on the intake side of irrigation pumps. The concentration of fertilizer applied will depend on the dilution rate of the device and the pressure and flow of the irrigation water. For these reasons, siphoning devices are usually used for liquid fertilization. However, they may be used for constant fertilization provided this variation in concentration is not objectionable or deleterious.

In recent years, many inexpensive metering devices have been introduced for use in constant fertilization operations. All are designed to actively force the fertilizer solution into the irrigation system. This is accomplished by using electric motors to drive a pump; a water-driven pump where the flow of water through the meter drives a pump; water pressure on one side of a diaphram; or by devices that constantly introduce water into the fertilizer stock solution. Equipment using the first three methods will maintain a constant concentration of fertilizer in the irrigation water irrespective of water pressure or flow, but the device using the last method will not. It is important to maintain constant concentration when the amount of fertilizer applied must be accurately determined, or when the location where the fertilizer solution is applied is constantly changing. If the area is not changing, the variable concentration proportioners may be used.

This fatsia plant was grown under liquid fertilization.

Type Fertilizer Used

Any water soluble fertilizer may be used. The grower will generally find that it will be cheaper to use a dry, water soluble fertilizer than a liquid concentrate. Single element carriers such as ammonium sulfate, or complete analysis fertilizers may be used. The factors to consider in determining the safe concentration are: (1) fertilizer material; (2) method of application; and (3) plant requirements.

This method of fertilization is not foliar feeding. Here the fertilizer is applied to the soil; with foliar feeding, the fertilizer is placed on the foliage only, not the soil.

FEED COSTS are often the expense items in milk production over which the producer has considerable control!

With the present trend to high producing cows, feed costs often become the key to profit or loss. In 1962, 20% of all Alabama herds on Dairy Production Testing produced an average of 10,000 lb. or more of milk per cow. Many studies have shown that well fed, high producing cows usually are profitable.

For a cow of a given weight and production ability, a number of feeding systems can be used to produce a fixed quantity of milk, according to numerous studies. Obtaining the least cost feed combination per cwt. of milk becomes a budgeting problem.

Feeding for LOW COST MILK Production

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Feeding Systems Compared

During the past 4 years, the dairy herd of the Piedmont Substation, Auburn University Agricultural Experiment Station, has been studied under two feeding systems. The results of this 4 years' work has been standardized for a cow weighing 1,250 lb. and producing 10,000 lb. of 4% fat corrected milk (FCM). The quantities of feed used and costs per cow are given in Table 1.

Production under the two systems has not differed. Excess forage grown and fed to a large number of replacements was credited to pastures, which could be the reason for lower pasture costs for milk cows. Hay and silage yields were relatively low all years. Either system could profitably be used by dairymen depending upon their land resources.

Feeds used, especially roughages, in the two systems have been charged to milk production at prices that include costs of producing, harvesting, storing, and feeding. In some years all corn was purchased. Bought items have been charged at their cost f.o.b. farm. The 4-year average prices used were as follows: corn silage $8.60 per ton, alfalfa hay $41.40 per ton, concentrate ration $54.80 per ton, pasture for cows in milk 44¢ per day, and pasture for dry cows 38¢.

Grazing areas consisted of some permanent pasture; small grain and clover, or ryegrass and clover in winter; and Starr millet in summer. Total production costs, including a land charge, were used in deriving daily pasture costs. The ration mixture and ingredient cost as 4-year averages were as follows: 1,610 lb. shell corn @ $1.20 per bu., 940 lb. oats @ 84¢ per bu., 450 lb. 41% cottonseed meal @ $3.45 per cwt., 30 lb. salt @ $1.50 per cwt., and grinding and mixing corn and oats @ 30¢ per cwt.

Using the 4-year results from this herd, budgets have been used to determine feed costs per cwt. of milk for a 1,250-lb. cow producing 10,000 lb. of 4% FCM under several alternative systems. Given in Table 2 are several systems, all with stored roughages and drylot fed using high and low grain rations. The alternatives vary from 70% grain and 30% forage to the exact reverse. The two systems described provided approximately 30% grain and 70% roughages. Coastal bermuda hay, Table 2, was at an assumed price of $20 per ton. Some additional protein may be needed for periods of 90 to 180 days to supplement the bermuda hay. In practice, cows generally decrease in production when bermudagrass is the only roughage. Grain ration mixture, as explained, was used with each system.

In addition to the systems of feeding stored roughages in drylot, several pasture-stored roughage systems were budgeted. A combination of low grain ration plus corn silage, plus Starr millet for summer grazing showed a possible cost of $2.16 per cwt. of milk produced. The same system with bermuda hay and some extra protein substituted for silage showed a possible cost of $1.92 per cwt. of milk.

Conclusions from Compared Systems

Of the 12 feeding systems compared, only those using bermuda hay with a low grain ration showed possibility of a large reduction in costs. With Coastal, management problems of adjusting the ration, adding protein, and proper feeding to bring cows to peak production are critical problems that need further research. Corn silage can be competitive with Coastal hay in areas where high yields will provide a fed-out cost of no more than $6.50 to $7.00 per ton rather than the $8.60 cost at the Piedmont Station. Some management problems with feeding corn silage need further research. Also, additional research is needed on the problem of lowering silage costs at all stages — producing, harvesting, storing, and feeding.

TABLE 1. FEED USED AND COST TO PRODUCE 10,000 POUNDS OF MILK

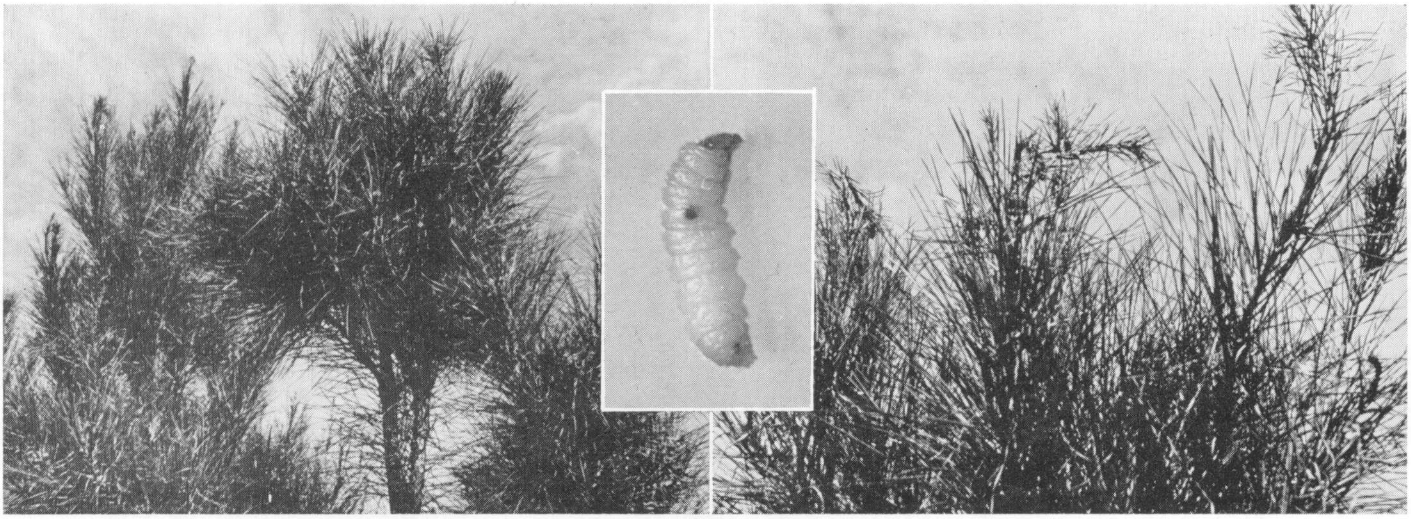
Kinds of feed used	Stored roughages		Conventional pastures	
	Amount	Value	Amount	Value
Corn silage, lb.[1]	20,300	$ 87.29	1,340	$ 5.76
Alfalfa hay, lb.	3,250	67.28	220	4.55
Grain concentrate, lb.	2,550	69.87	2,500	68.50
Pasture—				
Cows in milk, days	0	0	290	127.60
Dry cows, days	55	20.90	50	19.00
Total cost per cow	....	$245.34	....	$225.41
Cost per cwt. of milk	$2.45		$2.25	

[1] Silage is reported as harvested weight.

TABLE 2. AMOUNT OF FEED NEEDED PER COW AND COSTS PER CWT. OF MILK FOR VARIOUS FEEDING SYSTEMS

Ration number and kinds of roughages	High grain ration		Low grain ration	
	6,350 lb. grain + forage shown	Cost per cwt. of milk	2,720 lb. grain + forage shown	Cost per cwt. of milk
	Lb.	*Dol.*	*Lb.*	*Dol.*
1. Corn silage[1]	15,000	2.38	33,000	2.35
2. Alfalfa hay	3,900	2.55	9,300	2.65
3. Coastal bermuda hay	4,250	2.16	10,000	1.74
4. Added protein and No. 3	180	2.22	360	1.87

[1] Silage is shown as harvested weight; it is assumed that 85% of this amount will be consumed.



Typical damage to young pines from tip moth is shown here: At left is excessive branching (bushing) caused by repeated attacks; tree at right shows terminals that were killed. The inset shows a larva that has been parasitized by the small fly that is a natural enemy of the tip moth. The black spot on the larva is characteristic evidence of the parasite's presence.

PINE TIP MOTH – *Pest of Young Pines*

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PRODUCTION OF PINE TREES is a large and important program in Alabama. Each year the State tree nurseries produce millions of young pine seedlings for use in reforestation.

The resulting young plantations make a favorable home for *Rhyacionia frustrana* (Comst.), the Nantucket pine tip moth. This insect can be a serious pest of young pines in Alabama.

The adult insect is a small, brightly colored moth about ¼-in. long with a wing expanse of about ½ in. Its body is covered with silvery-gray scales and the forewings are marked with irregular red and copper-colored lines. The full-grown larva is yellowish to orange in color and about ⅜ in. long.

Larvae Cause Damage

Injury to young pines is the result of feeding habits of the larvae. Larvae tunnel in the new growth twigs and terminals causing them to die. Repeated and multiple attacks may kill terminals back as much as 10-12 in. Such damage results in a loss in growth and excessive branching and forking. In most instances, trees survive pine tip moth attack; however, repeated and heavy attacks may kill trees growing on poor sites.

In Alabama, tip moth infestations are generally heavier and more severe in pure pine plantations that were planted than those from natural regeneration. Loblolly and shortleaf species are favorite hosts and young trees under 15 ft. in height are the most susceptible. Slash is attacked only occasionally and longleaf seems resistant to attack.

Life History

The Nantucket pine tip moth overwinters in the pupal stage inside damaged twigs. Adult moths begin emerging on warm days in late winter and early spring. Eggs are laid on the stem and needle sheaths.

Newly hatched larvae may feed for a short time on the surface of the twig and bore into needle fascicles. Later they move to the tip of the twig, construct a resin-filled protective web, and bore into the bud and stem. Larval feeding continues for about 3 to 4 weeks and pupation occurs within the larval tunnels.

In Alabama, at least 3 complete generations of tip moth occur. Four generations are often found in central and southern Alabama. A fifth generation may develop in extreme southern Alabama.

Across the central area of the State, peak emergence of overwintering moths usually occurs in early March, followed by subsequent moth flights in mid-May and mid-July. A fourth flight may be observed in late August and early September where a fourth moth generation developed.

Natural Enemies Aid in Control

Results of studies during the past 3 years indicate that insect parasites may play an important role in natural regulation of tip moth populations. To date 17 species of parasites representing 2 orders and 9 families have been collected in Alabama.

Parasitism of tip moth larvae has generally averaged about 25% but has ranged as high as 50%. The major parasitic species encountered were *Lixophaga mediocris* Ald., a small fly, and two tiny wasps, *Hyssopus rhyacioniae* Gahan and *Eurytoma pini* Bugbee. All were parasitic on the larval stage of the moth.

In control studies, tip moth has been successfully controlled with insecticidal sprays timed to correspond with peak moth flight periods. However, control in large plantations has not proved economically feasible. For ornamental plantings or trees of high value, 1% emulsion of DDT provides effective control.

Effects of FIELD SEEDING and TRANSPLANTING on Cantaloupe Production

J. D. NORTON, *Department of Horticulture*

Transplanted and field seeded cantaloupes are shown here. Note increased size of vines from transplants at left over field-seeded area at right.

TRANSPLANTED CANTALOUPES produced higher yields than those field-seeded in tests at the Auburn University Agricultural Experiment Station.

Because of the difficulty in obtaining adequate stands for varietal comparisons from seed planted in the field, a comparison of transplanting with field seeding was incorporated into a trial of 10 varieties and breeding lines at the Station.

Three-week-old plants grown in 3-in. peat pots were transplanted to the field on April 15 each year for the 3-year period. Field-seeded plots were direct seeded the same days.

Yields Compared

When seeding methods were compared, the yield from transplants was significantly higher than from field-seeded plants, Table 1. The soluble solids content of fruit from varieties with satisfactory or higher solids averaged more than 2% higher from transplants than from field-seeded plants. Two factors were possibly responsible for the lower solids in the fruit from field-seeded plants. Because field-seeded plants matured later, foliar diseases were more severe. Field-seeded plants were also exposed to additional cloudiness and rainfall.

Varieties Compared

Fruit matured approximately 14 days earlier from transplants than from field-seeded plants.

TABLE 1. MEAN PER ACRE YIELD OF TRANSPLANTED AND FIELD-SEEDED CANTALOUPES, AUBURN, ALABAMA

Year	Treatment	
	Transplants	Field-seeded
	Lb.	*Lb.*
1961	10,312.9	2,827.5
1962	11,611.0	8,544.9
1963	23,419.1	4,454.2
Average	15,114.5	5,437.0

When comparing varieties, differences were recorded for yield, earliness, and soluble solids content of fruit. The plants that gave the highest yield were S.C. No. 180, Florisun, and Hales Best Jumbo. Plants with medium yield were Seminole, L-30-6-58, and Florida No. 1. Low yielding varieties were Rio Gold, PMR No. 45, 134 F_1, and Edisto.

The edible quality of fruit as indicated by soluble solids content was highest for Florida No. 1, Seminole, and Florisun. S.C. No. 180 and Edisto were satisfactory; however, the solids and edible quality of Hales Best Jumbo were unsatisfactory.

Success Factors

If a variety succeeds commercially, it must have a combination of desirable characteristics. In addition to high yield and desirable external and internal fruit characteristics, high soluble solids (primarily high sugars) are essential for sale of a U.S. No. 1 grade product and development of a stable commercial industry. Two varieties, S.C. No. 180 and Florida No. 1, have consistently produced high quality fruit. Florisun, a high yielding variety, has produced high quality fruit under most conditions. Although Seminole and Edisto have consistently produced high quality fruit, Seminole fruit size is too small. Yield of the Edisto variety has been low. Yield and external fruit characteristics of Hales Best Jumbo are excellent; however, the soluble solids have been too low to justify planting the variety.

Earliness also may be a factor in selecting a variety. Florisun matures about the same time as Hales Best Jumbo, an early variety. Florida No. 1 matures about 1 week after Florisun, while S.C. No. 180 maturity follows Florisun by about 2 weeks.

If a grower desires to take advantage of higher prices that are often paid for early melons, he may plant seed in peat pots in a protected area and transplant to the field when danger of frost is passed. This will place melons on the market 2 weeks earlier. By field seeding another planting, the marketing season may be extended.

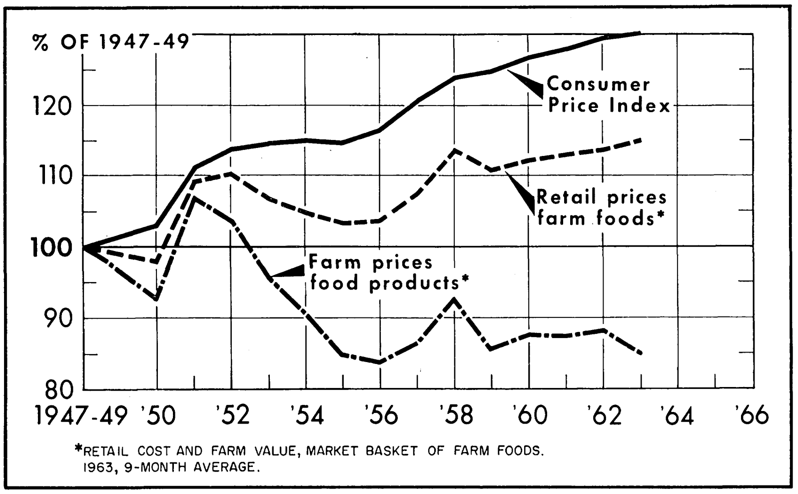
Extensive production is limited when hand operations are used in plant production and transplanting. However, equipment is currently available for mechanization.

TABLE 2. MEAN PER ACRE YIELDS FOR TRANSPLANTED AND FIELD-SEEDED CANTALOUPE VARIETIES, AUBURN, ALABAMA, 1961-1963

Variety	Yield per acre by years			Average 1961-63
	1961	1962	1963	
	Lb.	*Lb.*	*Lb.*	*Lb.*
PMR 45	6,142.3	8,338.1	3,551.9	6,008.8
Hales Best Jumbo	8,174.9	13,688.1	5,961.3	9,272.9
Seminole	5,799.6	9,364.8	10,691.2	8,617.0
L-30-C-58	5,548.9	10,744.6	9,783.2	8,691.2
Florida No. 1	4,038.9	13,103.6	4,815.9	7,317.4
Florisun	11,168.9	9,691.2	7,961.3	9,605.1
134F_1	4,516.2	9,685.3	3,344.1	5,868.5
S.C. No. 180	9,744.6	10,881.1	15,750.4	12,124.4
Edisto	3,988.0	6,581.5	940.6	3,836.7
Rio Gold	6,450.9	8,530.9	5,163.1	6,714.9

Farm and Market EFFICIENCY Make FOOD A BARGAIN

MORRIS WHITE
Dept. of Agricultural Economics



Major reason for low retail food prices is illustrated here. Farm prices of food products have gone down during the past 10 years, while consumer price index went up. (Source: Economic Research Service, USDA.)

EXCELLENT PERFORMANCE by both farmer and marketer helps make food the bargain it is today.

The average worker on United States farms is now producing food and fiber for 29 persons, as compared with 15 in 1950. Productivity of the marketing system has increased substantially, but not as great as on the farm. Food moved through the marketing system increased 32% between 1950 and 1963, but number of workers rose only 11%.

Per capita consumption of food products has tended to increase since the end of World War II. A fairly steady uptrend between 1947 and 1962 amounted to 3.5% total increase in food use.

Meats showed the greatest increase in consumption, with beef and poultry being the important commodities (see table). Use of nonfat milk solids remained about the same, but fluid milk and cream decreased by 16%. Decreases in per capita consumption of fresh fruits and vegetables were partially offset by increased use of processed fruits and vegetables. Large decreases in consumption were noted for eggs, potatoes, sweet potatoes, and certain cereal products.

Personal income of urban families has been rising since 1950. Although these families spent an average of $1,311 for food in 1960, as compared with $1,130 in 1950, the proportion of total family expenditures that went for food dropped from 30% to 24%.

Last year, only 19% of total disposable income was spent for food, as compared with the post-war high of 27%. Each hour of labor continues to be worth an increasing amount of high quality, convenient food.

Price of farm foods in retail stores averaged 15% higher in 1963 than in 1947-49. This was a modest increase, when compared with the average increase of 31% for all consumer goods and services in the same period.

An important factor in keeping retail food prices at bargain levels was a decline in prices received by farmers (see graph). In 1963, a farmer's return for foods was 15% below the 1947-49 average for a like quantity — this while the spread between farm and retail prices rose 44%.

Lower farm prices were largely the result of abundant supplies of farm products and the consequent poorer bargaining position of the farmer. Another contributing factor was the general price picture in the economy since World War II. Cost of "services" has gone up much faster than have prices of raw materials and manufactured goods.

The average of all food prices has increased, but some much more than others. Retail price of poultry has actually decreased since 1947-49, while bread has gone up 60%.

In general, prices have increased the most for foods having the greatest proportion of marketing services. In the case of bread, price of wheat has little effect on price of the finished product. If the price of wheat should suddenly increase by $1 per bu., the cost of wheat in a 1-lb. loaf of bread would not go up much more than 1¢; conversely, a large drop in wheat prices would cause only a small drop in consumer prices of bread. If the baking industry could reduce cost of baking and distributing bread by 3¢ to 4¢ per loaf, the impact on consumer price would be greater than if farmers gave wheat away.

Frying chickens present a striking contrast to the bread situation. Large decreases in farmers' prices of chickens have resulted in a 17¢ per lb. drop in retail prices since 1950. The spread between farm and retail price has been almost constant at 20¢ per lb. Thus, the entire decrease in farmers' prices could be passed on to consumers.

ESTIMATED CIVILIAN PER CAPITA CONSUMPTION OF MAJOR FOOD COMMODITIES, UNITED STATES, 1947-49 AVERAGE, 1954-63

Year	Red meat	Poultry	Dairy products	Eggs	Flour and cereal products	Vegetables: Fresh	Vegetables: Total
	Lb.	*Lb.*	*Lb.*	*No.*	*Lb.*	*Lb.*	*Lb.*
1947-49	148	22	732	385	171	120	200
1954	155	28	699	376	155	107	196
1955	163	26	706	371	152	105	199
1956	167	30	703	369	150	107	202
1957	159	31	685	362	148	106	202
1958	152	34	680	354	150	104	202
1959	160	35	666	352	148	103	201
1960	161	34	653	334	146	106	206
1961	161	38	640	326	146	105	205
1962	164	37	637	324	143	103	207
1963	166	39	632	316	143	102	207

Source. Agricultural Handbook No. 258 and National Food Situation, Economic Research Service, U.S. Department of Agriculture.

Long Lasting Effects from Perennial Legumes

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Department of Agronomy and Soils

PERENNIAL LEGUMES, such as alfalfa, sericea, and kudzu, add nitrogen and organic matter to the soil. This nitrogen can be utilized by non-leguminous crops like cotton, corn, or forage grasses, thus decreasing the need for applying fertilizer nitrogen.

Effects of legume residues on succeeding crops can be observed for several years. The magnitude of this effect is influenced by age of the legume stand, its growth and use, as well as soil type, fertility, and moisture relations. Amount of the residual effect on succeeding crops and how long it lasts determines when nitrogen applications should be resumed and rates to be applied.

Residual Value Measured

Experiments were begun in 1949 at the Monroeville and Prattville Experiment Fields following 6 years of kudzu for hay. These studies were continued for 12 years to learn amount and persistence of residual effects on following crops.

Treatments included rates of N, vetch for green manure, and rotation of cotton and corn. All plots were limed initially and were fertilized annually with 60 lb. each of P_2O_5 and K_2O. One corn treatment included magnesium and a minor element mixture containing zinc, boron, copper, and manganese.

Average yields at the two locations for continuous corn and continuous cotton are shown in the graph. Points plotted are 3-year averages. These include the years immediately before and after the year plotted. Two-year averages were used for the first and last years of the experiment.

Corn Yields Show Effects

The residue from kudzu was sufficient to produce good corn yields for 2 years. The plot that did not receive N began to yield less than the others in the third year. Kudzu plots that got 36 lb. of N were as productive as the 72-lb. N plots through the fourth year.

Corn yields were reduced by drought 3 of the first 6 years, thus limiting effects of the treatments. After the first 4 years, 72 lb. N yielded more corn than 36 lb. In the last 4 years this difference averaged 13 bu. of corn. Had higher rates been used, yields probably would have been greater; results of other experiments show responses to 90 lb. of N.

On vetch plots, corn yields were between those resulting from 36 lb. and 72 lb. of N. For the last 4 years, the average was 4 bu. less than from 72 lb. N. When 36 lb. of N was used following vetch, yields were increased about 7 bu. for the last 4 years.

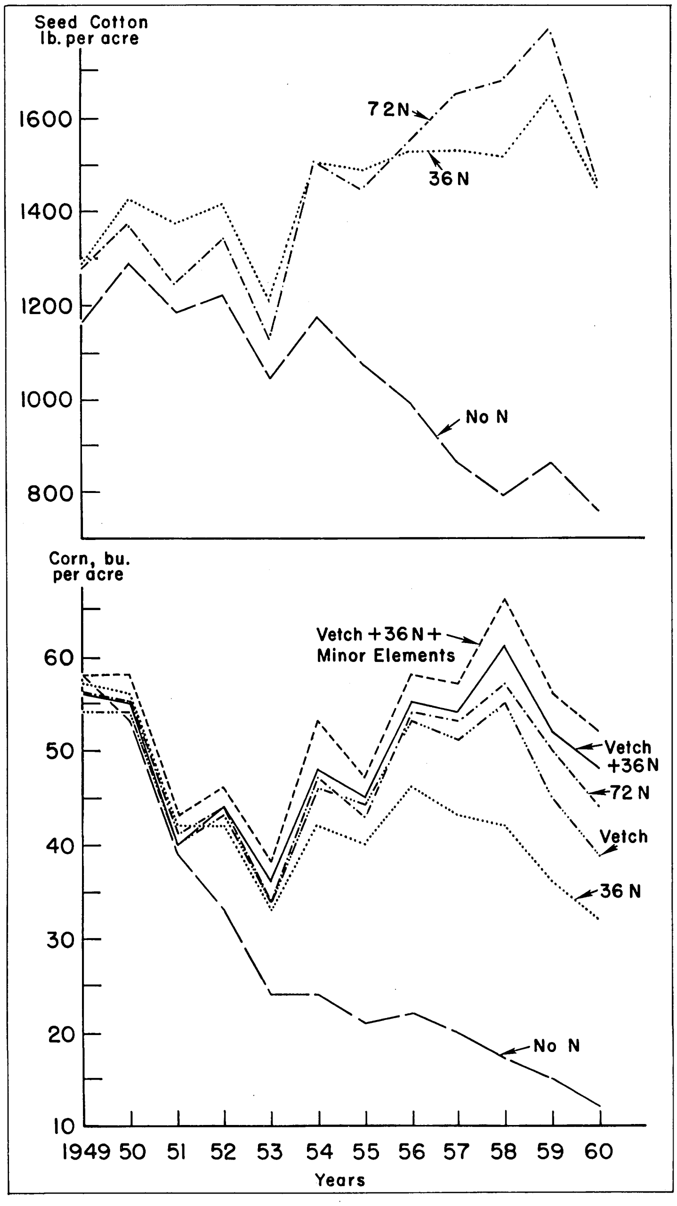
Using micronutrients increased yield an additional 5 bu., making the minor element plots the highest yielding in the experiment. These data do not reveal which element or elements were responsible for this increase, but zinc or magnesium probably caused the difference.

Cotton Needed Less N after Legumes

Residue from kudzu was good enough for 4 years to produce an average yield of 1,200 lb. of seed cotton without added N. For 8 years after kudzu, 36 lb. N produced as much cotton as did 72 lb.

Had weather conditions been favorable for high yields, response to 72 lb. N probably would have occurred earlier than the 8 years noted. The data indicate that cotton following a good crop of perennial legume should need no more than 36 lb. of N for several years.

The experiment included a 2-year rotation of cotton and corn, in which both crops received 72 lb. of N per acre. Rotating the two crops did not increase cotton yields, and corn yields were not increased until the eighth year. For the last 5 years, corn yields were increased 7 bu. per acre by rotation with cotton.



MILK—
Prices, margins and returns

LOWELL E. WILSON, *Dept. of Agricultural Economics*

CONSUMERS in the United States spent in 1962 about $12 billion for dairy products or 19% of the total expenditures for food. Purchases of dairy foods, in fact, were exceeded only by meats (25%) and fruits and vegetables (24%) in the food budgets.

In volume of product and sales value, milk sold to consumers as fresh fluid milk is the leading segment of the dairy industry. In 1962, 46% of the milk supply produced in this country was utilized in fluid consumption, 26% in creamery butter, 11% in cheese, and 17% in other dairy products.

The amount spent for fluid milk by consumers may be divided into two parts: (1) payments to farmers that represent returns for production of raw milk supplies, and (2) payments to handlers that assemble and process the milk and perform marketing services in getting the milk product to consumers in the form, and at the time and place they desire.

Share of Consumer's Dollar

Studies of the farm-retail spread for all types of dairy products show that the farmer currently receives an average of 43¢ of the consumer dollar spent for dairy foods. The remaining 57¢ pays for costs and profits for assembling, processing, and distributing the milk products (gross marketing margin).

During the first three quarters of 1963, the price of a quart of bottled milk averaged 25.9¢ in the United States. Of this amount the farmers' share was 11.3¢ and the marketing margin was 14.6¢. Thus the farmer got 44¢ of each dollar spent for bottled milk during that period. In recent years the farmers' share of the milk dollar has declined somewhat because of an increase in marketing costs and a decline in farm value of milk.

Alabama Prices and Margins

In Alabama the price of milk for fluid use to producers, distributors, and consumers is fixed by the State Milk Control Board. Through 1963 a quart of milk retailed for 28.5¢ in the Birmingham and Montgomery markets and 27.5¢ in Mobile, Table 1. Of the retail value of a quart of milk, Alabama producers received approximately 14¢ or 50% in each market. For the fluid milk sold through grocery stores, distributors received about 40% of the retail price, retailers 8%, and producers the remainder.

Retail prices for milk sold in half-gallons were 54¢ and 55¢ in the Alabama markets. For half-gallons, the farmers' share of the retail price was slightly larger. Savings to consumers for purchases in half-gallon containers resulted from a lower marketing margin for the larger size.

TABLE 1. FARMERS' SHARE AND GROSS MARGINS FOR MILK SOLD IN ALABAMA MARKETS, 1963

Market	Quart			Half gallon		
	Retail price	Farmers' share	Gross margin	Retail price	Farmers' share	Gross margin
Birmingham, ¢	28.5	14.0	14.5	55.0	28.1	26.9
Mobile, ¢	27.5	13.8	13.7	54.0	27.7	26.3
Montgomery, ¢	28.5	13.9	14.6	55.0	27.8	27.2
Birmingham, %	100.0	49.3	50.7	100.0	51.1	48.9
Mobile, %	100.0	50.3	49.7	100.0	51.2	48.8
Montgomery, %	100.0	48.7	51.3	100.0	50.5	49.5

Source: USDA, Fluid Milk and Cream Report.

Distributors' Costs

A study of selected milk distributors reported by the U.S. Department of Agriculture showed that distributors received $11.37 per 100 lb. of milk and cream processed in 1961, Table 2. This study was based on cost accounting data from 80 fluid milk firms throughout the United States. Of net sales receipts, $5.02 was paid for raw milk and cream plus 95¢ for other materials used in fluid milk products. The remaining $5.40 was the gross marketing margin, which must cover all operating costs and profits.

Cost of employing workers in processing and distributing milk accounted for more than half of the marketing margin and about a fourth of the consumer dollar for milk. Labor cost included salaries, wages, commissions, payroll taxes, pensions, and other benefits.

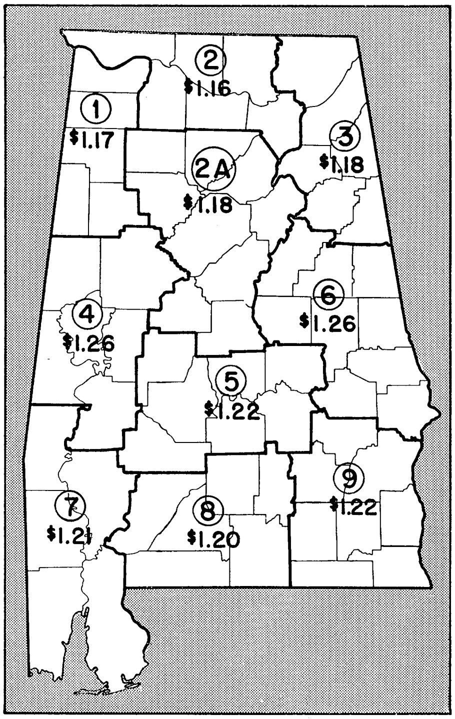
Container cost was a major item to milk distributors, averaging 5.89% of the net sales receipts. Combined repairs, rent, and depreciation amounted to 5.98%; operating supplies another 2.64%; and all other expenses 5.72%.

The net margin or returns to plant owners before payment of income taxes were 43¢ per 100 lb. of milk and cream processed or 3.78% of receipts.

TABLE 2. COSTS AND MARGINS PER 100 POUNDS OF MILK AND CREAM, PROCESSED BY SELECTED DAIRY FIRMS IN THE UNITED STATES, 1961

Item	Dollars		Per cent	
Net sales receipts		11.37		100.00
Cost of raw milk and cream	5.02		44.15	
Other materials	.95		8.36	
Gross margin	5.40		47.49	
Operating costs				
Salaries, wages, commissions		2.67		23.48
Containers		.67		5.89
Repairs, rent, depreciation		.68		5.98
Operating supplies		.30		2.64
Taxes		.06		.53
Insurance		.05		.44
Services		.19		1.67
Advertising		.19		1.67
General		.16		1.41
Total		4.97		43.71
Net margin[1]		.43		3.78
Gross margin		5.40		47.49

Source: Milk Distributors Operations, USDA, ERS, Nov. 1962.
[1] Net returns to dairy firm owners before income taxes.



Variation in prices received for corn by Alabama farmers during 1960-62 is illustrated by the map. Average mid-month prices are shown for each of the State's nine Crop Reporting Districts.

Corn Price Changes Affect Alabama Farmers

B. R. McMANUS, *Dept. of Agricultural Economics*

PRICE CHANGES influence production and use of corn. Both the general level of and fluctuations in prices have important effects on corn producers, handlers, and users. Prices are affected by such factors as levels of production, volumes used and stored, seasons of the year, and marketing practices.

Corn is grown over wide areas, is sold on a national as well as a local market and has many important uses. Thus, an individual farmer cannot produce enough corn to affect market price except in a few local situations. The major farm requirement is to produce the quality of corn desired by users at a price that will be profitable to both buyer and seller.

Transportation and Grade Affect Prices

Alabama is still a corn-deficit state, which imports one-fourth to one-half of the corn used. Prices have been affected by price levels in corn-surplus areas plus movement charges into Alabama. Differences between Alabama prices and prices at various origins of corn shipped into the State have been about equal to transportation plus handling costs. During harvest time, this differential has been reduced because local demand has been supplied primarily from local production.

Form, whether shelled or ear, and grade affect prices, as reflected by the practice of paying premiums or discounting based on a standard grade, usually No. 2 yellow. Grades are based on test weight per bushel, moisture, cracked corn and foreign material, and damaged kernels. Data from an economic study revealed that four-fifths of farmers who marketed corn in Alabama during 1960-61 sold ungraded ear corn. On the basis of total sales, 60% was ear and 40% shelled corn.

Prices Vary among Districts

Mid-month corn prices received by Alabama farmers during recent years varied among Crop Reporting Districts (see map). However, monthly prices varied more within districts than among districts. In general, areas with least production had highest prices. Districts 4 and 6 had highest prices and the Tennessee Valley had the lowest.

On the basis of three general areas of the State, central Alabama farmers received the highest 3-year average price and northern Alabama producers got lowest prices. (Districts 1-3 are northern Alabama, 4-6 make up central, and 7-9 are southern Alabama Districts.) Price differences amounted to 8¢ per bushel between central and northern and 4¢ between central and southern Alabama.

Season Affects Prices

Based on reports from 290 farmers, 91% of shelled corn marketed in 1960-61 was sold in the fall at an average price of $1.08 per bushel. The other 9% was sold the following spring for an average price of $1.30. The 22¢ per bushel difference was the return for storing 3 to 6 months. Budgets indicate that 22¢ per bushel normally will give a reasonable return for 6 months storage of shelled corn. However, Crop Reporting Service data for 1958-63 show a difference of 17¢ per bushel between the average high monthly price period of June and July and the average low price in November. This difference gave more than enough return to cover variable costs, but not enough to pay total costs.

Corn prices were lowest in October, November, and December and highest during late spring and summer (see table). Beginning in December, the price gradually rose to a peak in June and July, declined slightly in August, and then dropped to a low in 3 months.

Seasonal price variation has been influenced by the level of price supports of corn and by CCC selling activities. As long as such programs remain in effect, seasonal price variation should approximately equal storage costs.

Corn prices will continue to increase in importance in Alabama as more farmers produce corn as a cash crop and as livestock becomes increasingly important as a source of farm income. Under these circumstances, it will pay to become familiar with corn price movements.

AVERAGE SEASONAL MOVEMENTS OF ALABAMA FARM PRICES FOR CORN, 1958-63

Month	Seasonal average		Number of times[1]	
	Price per bushel	Pct. of average price	High	Low
Oct.	$1.12	92	0	3
Nov.	1.11	91	0	3
Dec.	1.13	93	0	0
Jan.	1.17	97	0	0
Feb.	1.22	100	0	0
Mar.	1.26	104	1	0
Apr.	1.26	104	1	0
May	1.27	105	2	0
June	1.28	106	2	0
July	1.28	106	2	0
Aug.	1.27	104	0	0
Sept.	1.19	98	0	0
Av.	1.21	100		

[1] When the high or low price occurred in more than one month, each month was reported as a high or low.

L. M. WARE and W. A. JOHNSON
Department of Horticulture

FERTILIZER APPLICATIONS vs. RAINFALL RECORDS

Both of the above plots received 2,500 pounds per acre of 4-10-7. The plot at left received this amount in three applications while the plot at right received the total amount in one application.

INCREASES FROM TWO TO SIX times may result from determining time and number of fertilizer applications to various vegetable crops by studying rainfall records of your area for a given year.

Results from many studies at the Auburn University Agricultural Experiment Station of different crops on both light (coarse) and heavy (fine) soils have shown that under certain conditions yields may be doubled, tripled, or even increased 5 or 6 times by adding the same amount of fertilizer in 2 or 3 applications rather than in one.

Analyses of results have led to these observations: (1) that there are great differences from year to year in response by crops to divided or "split" applications; (2) that greatest differences in yields from single and split applications occur during seasons of heavy rainfall; (3) that the amount, distribution, and duration of the rains determine the differences that occur; (4) that heavy rains falling slowly enough to percolate through the soil and within a short time after fertilizer application before crops have had time to make use of plant food result in greatest differences; (5) that the basic cause is loss by leaching of plant food especially nitrogen and to a less extent potash; and (6) that losses in plant food and subsequent loss in crop yield are much higher on light than on heavy soils.

Data in Table 1 show yields of No. 1 potatoes produced in 1952, 1953, and 1954 from single and triple applications of two rates of fertilizer. Table 2 gives yields for 1955, 1956, and 1957 when different ratios of the total fertilizer were added in one, two, and three applications. Rainfall patterns are indicated for each year. Table 3 gives nitrate content of the soil at stated periods in adjacent experiments with indicated rainfall between applications of the fertilizer and sampling dates. The rate of fertilizer in this experiment was 1,500 lb. per acre added in two applications.

TABLE 1. YIELD OF POTATOES FROM VARIOUS FERTILIZER RATES AND NUMBER OF APPLICATIONS, SERIES 1-3

Fertilizer rate	Applications	Yield of No. 1's		
		1952	1953	1954
Lb.	*No.*	*Bags*	*Bags*	*Bags*
1,500	1	55	10	96
2,500	1	72	12	113
1,500	3	113	49	88
2,500	3	140	76	157
Rainfall	Early	H	H	L
	Medium	L	L	L
	Late	M	H	L

H—heavy, M—medium, L—light

TABLE 2. YIELD OF POTATOES FROM VARIOUS FERTILIZER RATES AND METHODS OF APPLICATION, SERIES 1-3

Fertilizer rate under	Side		Yield of No. 1's		
	1st	2nd	1955	1956	1957
Lb.	*Lb.*	*Lb.*	*Bags*	*Bags*	*Bags*
1,000			64	10	12
1,500			64	7	10
2,000			75	17	21
1,500	500		72	66	26
1,000	1,000		64	125	57
1,000	500	500	110	57	101
667	667	667	105	67	107
Rainfall	Early		L	H	H
	Medium		M	L	H
	Late		M	L	L

H—heavy, M—medium, L—light

Yields in 1952 from single fertilizer applications were average and were doubled by split applications. Yields were extremely low in 1953 from single applications; although they were increased 5 to 6 times by splitting the application, they were still not high. In 1954, a very dry season, yields were good from a single application and not greatly increased from the split application. Rainfall patterns appeared similar in 1952 and 1953 for the early and medium periods, although leaching was greater in 1953; rainfall was lighter during the late period in 1952 than in 1953.

In 1955 with light rainfall during the early period, yields were fair from single applications and were increased only from the late application. Rainfall early in the season was high in 1956 and in 1957 and yields both years were extremely low for single application. It was the last application that gave highest yield increases in 1955 and 1957 but the second application that gave highest increase in 1956. Rainfall was very low during the last two periods of 1956.

The soil in the latter study was a sandy loam. In a related study with alternating plots of sandy loam and clay soils, yields during a 4-year period on plots receiving 1,500 lb. of fertilizer showed an increase from split application on light soil of 75%, and on the clay soil of 7%; the increase was 63% on the sandy loam soil, and 40% on the clay soil at the 2,000 lb. fertilizer rate.

TABLE 3. NITRATE LEVELS AND RAINFALL

Item	Years					
	1952			1953		
Date fertilizer application[1]	2/9	4/9	4/29	2/3	3/17	4/3
Date soil sampled	3/31	4/15	4/28	3/17	3/30	4/15
Leaching rains (in.)[2]	10.0	1.4	3.2	7.3	1.2	5.6
NO_3 p.p.m.	3	58	5	6	23	10
	1954			1955		
Date fertilizer application[1]	2/5	3/22	4/14	2/15	3/16	4/22
Date soil sampled	3/15	4/19	5/3	3/15	4/12	5/16
Leaching rains (in.)[2]	3.6	1.7	1.9	1.2	2.6	0
NO_3 p.p.m.	47	108	16	44	94	60

[1] Fertilizer rate was 1,500 lb. per acre—added in 2 applications.
[2] Leaching rains between date of fertilizer application and date soil samples were taken.

What are best ways of determining

WHEN to IRRIGATE?

W. A. JOHNSON and L. M. WARE
Department of Horticulture

MECHANIZATION MAY PAY in most farm operations but not in the case of determining when to irrigate potatoes and cabbage.

A study was made at the Auburn University Agricultural Experiment Station to determine the relative effectiveness and efficiency of irrigation when applications were determined by instrument and when applied according to certain rules of thumb.

Rates and Frequencies Used

The rates and frequencies of application are expressed as inches of water applied on either one or two days each week. The rates and frequencies were: 0-0, 0-1, 0-⅔, ½-½, ⅔-⅔, and a graduated rate with ⅓, ½, and ⅔ in. applied twice weekly during early, medium, and late parts of the growing season, respectively. Two instrument treatments were used. These consisted of tensiometers placed in the soil 4 and 8 in. deep.

Tables 1 and 2 give the weekly rates and frequencies of irrigation, the total number and amounts of irrigation added, yields and increases in yield from irrigation, and units increase in yield for units of irrigation added. Results in Table 1 are on potatoes and Table 2 on cabbages.

Yields Compared

Of the 8 comparisons on potatoes, the highest increase in yield from irrigation and the one returning the highest increase in yield for the amount of water added was the graduated method. The second largest increase was from the ⅔-⅔-in. rate and frequency. The third highest increase was from the instrument method with tensiometer placed 8 in. in the soil and the water applied at the rate of ⅔ in. when the instrument indicated the need. The instrument method required the largest number of irrigations of any method and returned fewer potatoes for the water added than any other method. The graduated rate returned 103 bags of No. 1 potatoes from 8.7 irrigations, amounting to 5.3 in. of water and requiring only 1,398 gal. for each 100-lb. bag increase in yield. The instrument method gave 87 bags increase, required 9.3 irrigations for a total of 6.2 in. of water and required 1,949 gal. of water for each bag increase.

In general, methods based on two applications per week gave larger increases of potatoes than those based on one application a week, and increases in yield followed increases in the amount of total water added. The important exception was found in the method based on the graduated rate.

With cabbages, the highest increase from irrigation came from the ⅔-⅔-in. rate. This was followed by the graduated ⅓-½-⅔-in. rate, the ⅔-in. instrument method, the 0-1-in. rate, the ⅓ instrument rate, the ½-½ rule including rainfall, the ½-½ in. rate, and the 0-⅔-in. rate.

An increase of 26,006 lb. per acre of marketable cabbages was obtained by the ⅔-⅔-in. rate. For this increase an average of 9.5 irrigations totaling 6.33 in. of water was required. By this method, an increase of 1 lb. of marketable cabbage was obtained for each 6.62 gal. of water added. The instrument method with tensiometer placed 8 in. deep required an average of 11.5 irrigations. An average of 9.46 gal. of water were added for each 1 lb. increase in cabbage produced.

In general, about twice as much water was required to give each pound of increase in potatoes as in cabbage. Irrigation methods and rates based on rule of thumb were as good or better than those based on instrument. One of the best methods is based on a graduated rate with increasing amounts of irrigation as the growing season progresses and as the demands of the crop increase.

TABLE 1. IRRIGATION SCHEDULE, IRRIGATION ADDED, INCREASED NO. 1 POTATOES AND GALLONS IRRIGATION WATER PER BAG INCREASED—3-YEAR AVERAGE

Irrigation schedule Tues.	Fri.	Irrigation		Yield No. 1 per acre	Increase No. 1 per acre	Gal. irrig. for each 100-pound increase
In.	*In.*	*No.*	*In.*	*Bags*	*Bags*	*Gal.*
0	0	0	0	59		
0	1	4.7	4.7	133	74	1,725
½	½	8.7	4.3	144	85	1,377
0	⅔	4.3	2.9	101	42	1,889
⅔	⅔	8.7	5.8	155	96	1,648
(⅓, ½, ⅔)[1]		8.7	5.3	162	103	1,398
⅓	⅓[2]	13.0	4.3	135	76	1,535
⅔	⅔[3]	9.3	6.2	146	87	1,949
½	½[4]	9.7	4.8	135	76	1,718

[1] Irrigation applied at rate of ⅓ inch twice weekly for first part of season, ½ twice weekly for middle, and ⅔ twice weekly for latter.
[2] Amount applied when tensiometer 4" deep indicates moisture level at 75% moisture holding capacity of the soil.
[3] Amount applied when tensiometer 8" deep indicates moisture level at 75% moisture holding capacity.
[4] Amount applied including rainfall.

TABLE 2. IRRIGATION SCHEDULE, IRRIGATION ADDED, INCREASED MARKETABLE CABBAGE AND GALLONS IRRIGATION WATER PER POUND INCREASED—2-YEAR AVERAGE

Irrigation schedule Tues.	Fri.	Irrigation		Yield marketable per acre	Increase marketable per acre	Gal. irrig. for each pound increase
In.	*In.*	*No.*	*In.*	*Lb.*	*Lb.*	*Gal.*
0	0			24,477		
0	1	5.0	5.00	46,423	21,946	6.19
½	½	9.5	4.75	42,156	17,679	7.30
0	⅔	4.5	3.00	33,875	9,379	8.70
⅔	⅔	9.5	6.33	50,483	26,006	6.62
(⅓, ½, ⅔)[1]		9.5	5.92	47,088	22,611	7.12
⅓	⅓[2]	16.0	5.33	46,268	21,791	6.65
⅔	⅔[3]	11.5	7.67	46,528	22,051	9.46
½	½[4]	11.0	5.50	42,493	18,016	8.30

[1] Irrigation applied at rate of ⅓ inch twice weekly for first part of season, ½ twice weekly for middle, and ⅔ twice weekly for latter.
[2] Amount applied when tensiometer 4" deep indicates moisture level at 75% moisture holding capacity.
[3] Amount applied when tensiometer 8" deep indicates moisture level at 75% moisture holding capacity.
[4] Amount applied including rainfall.

Index to Articles Published in

HIGHLIGHTS of Agricultural Research

1963

THE YEAR 1963 marked the first decade of publication of HIGHLIGHTS OF AGRICULTURAL RESEARCH. In this 10-year period, the quarterly was increased in number of pages and in circulation to meet the response of Alabama farmer readers and agricultural leaders.

The four Volume 10 issues featured 55 articles covering 15 major areas of research. For your convenience, articles published in 1963 are indexed here. Copies of Volume 10 issues are available. Write Editor, Auburn University Agricultural Experiment Station, Auburn, Ala., for replacement copies, specifying the issues you need.

Auburn 56 cotton is the major crop variety grown for foundation seed at the Seed Stocks Farm. At right is foundation seed field of Serala sericea, an improved variety developed by the Auburn Experiment Station.

FOUNDATION SEED STOCKS FARM – dedicated to producing pure seed

R. E. STEVENSON, *Associate Editor*
G. T. SHARMAN, JR., *Superintendent*

VALUE OF GOOD SEED has long been recognized by farmers. Regardless of production practices followed, a crop can be no better than the seed that are planted.

Importance of pure seed is the only reason for existence of the Foundation Seed Stocks Farm, Thorsby. This unit of Auburn University Agricultural Experiment Station has the responsibility of maintaining genetically pure foundation seed for use by producers of certified planting seed. Thus, Alabama farmers are assured of high quality planting seed.

Work of the Seed Stocks Farm is in close cooperation with the Alabama Crop Improvement Association. All seed distribution is handled through the Association. Seed of varieties developed by Experiment Station plant breeders are supplied to Association members who produce certified planting seed, and a small quantity goes to other state seed groups.

A former Soil Conservation Service nursery, the 182-acre farm was deeded to Auburn University by the U.S. Government. Operation was begun in 1954 under administration of the Department of Agronomy and Soils. An original grant of $7,500 per year by the Crop Improvement Association aided in getting work underway, and the organization has continued financial support.

Corn was the unit's major supporting crop during the first years of operation, with small grains also of importance. When Auburn plant breeders developed Auburn 56 cotton, this valuable wilt-resistant variety became the Farm's most important product. Annual production of Auburn 56 is usually about 50 tons of foundation seed on the unit, plus 20 to 25 tons that are contracted.

The unit has become too small as number and acreage of crops grown for seed have multiplied. Some 200 acres of open land is leased and some seed production is done under contract with other units of the Experiment Station System and individual farmers.

In addition to Auburn 56 cotton, the unit produces seed of corn, soybeans, wheat, rye, clovers, oats, and vetch, plus Coastal bermudagrass stolons. Serala, a new Station-developed sericea, is now being increased and will be maintained.

Physical facilities of the Farm got a big boost with completion of a seed processing and storage building in 1960. An appropriation of $28,000 by the 1959 Alabama Legislature financed construction of the 60 × 160-foot facility. The building houses seed processing equipment and provides adequate bulk storage space.

Additional dry storage facilities are needed for long-time seed storage. The Farm attempts to maintain a year's surplus of seed to ensure an adequate supply in case of seed failure.

A "bonus" advantage of the Seed Stocks Farm is its suitability for agricultural research, with much of the acreage equipped for irrigation. Numerous studies – mainly concerned with irrigation and water utilization – are being done by USDA Agricultural Research Service in cooperation with the Auburn Station. Stationed at the Thorsby unit are three ARS soil scientists and two aides.

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