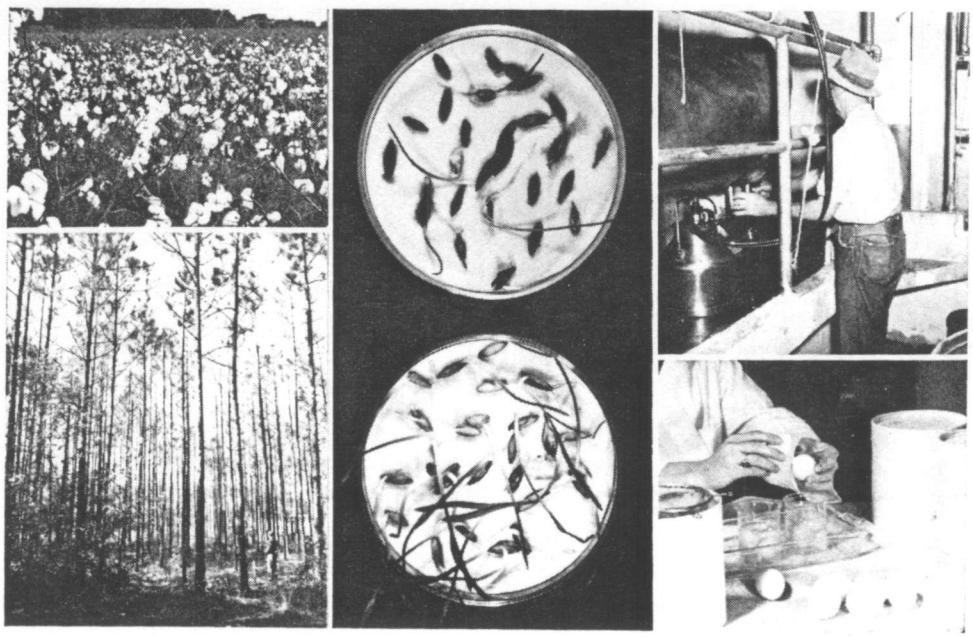
HIGHLIGHTS *of* AGRICULTURAL RESEARCH

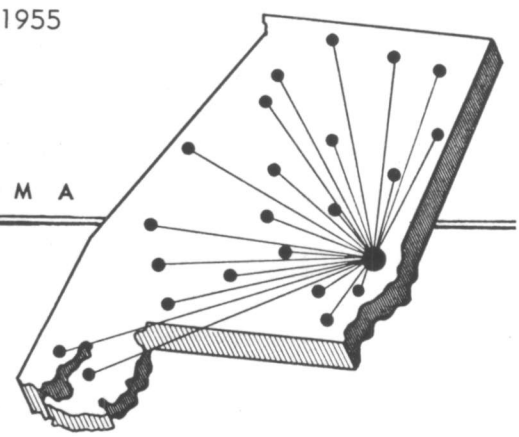


In this issue—Cotton Insects Can Cost Growers $50 Million a Year . . . Cotton Insecticides of Little Value If Not Properly Applied . . . Seed Treatment Protects Oat Seedlings Against Disease . . . V-Type Parlor Cuts Milking Time 25% . . . Research Provides Timber Owners Better Methods for Higher Returns . . . Freeze Surplus Eggs for Home Use and Market . . . Discolored Camellia Leaves Indicate Nutrient Deficiency.

VOL. 2, No. 2 — SUMMER 1955

SERVING ALL of ALABAMA

AGRICULTURAL EXPERIMENT STATION SYSTEM
of the
ALABAMA POLYTECHNIC INSTITUTE



Effects on seed cotton yields by timing applications: (A) untreated checks averaged 337 lb. per acre; (B) cotton treated with toxaphene at 4 weekly intervals beginning at 2- to 4-leaf stage with no further treatments averaged 390 lb.; (C) cotton treated same as (B) plus 13 applications during maximum fruiting averaged 1,507 lb.; (D) cotton treated 13 times during maximum fruiting, 1,426 lb.

COTTON INSECTS Can Cost State's Growers $50 Million in A Single Year

F. S. ARANT, *Head, Dept. of Zoology-Entomology*

FIFTY MILLION is a heap of money! Yet, if cotton insects are not controlled in a single year of abundance, that is what they will cost you and other farmers.

Just how this loss can be reduced or practically eliminated depends on the extent of use of recommended control measures backed by research of the API Agricultural Experiment Station.

Control and Soil Fertility

Control of cotton insects has proved highly profitable on land capable of yielding one-half bale or more per acre. On poor land, control doesn't pay. These conclusions are from an early experiment (1924-43) in which calcium arsenate was used as the insecticide. Summarized here are the results of that 20-year experiment conducted before the coming of organic insecticides: On 1/10-bale land, gain from dusting averaged only 50 pounds of seed cotton per acre; on ½-bale land, 240 pounds; on ¾-bale land, 335 pounds; and on 1-bale land, 456 pounds.

Control With Organics

Research results show that organic insecticides are more effective than calcium arsenate in controlling cotton insects in Alabama. Two of the new organics, toxaphene and BHC-DDT mixture, have been tested for 8 years in the State. Well-fertilized plots treated with these materials averaged over one-half bale more cotton per acre than untreated plots. Average yields from these treatments are given in the table.

Timing Applications

Results from time of application experiments conducted for many years in Alabama show that pre-square treatments failed to increase cotton yield much above that of untreated check plots. Furthermore, they did not reduce the number of applications needed later in the season. (See photos.)

Dusts Vs. Sprays

Research results show that dusts and sprays are about equally effective in controlling cotton insects in Alabama, provided the treatments are applied properly. A 2-year average yield of seed cotton from sprayed plots was 1,567 pounds per acre as compared with 1,444 pounds from dusted areas and 793 pounds from untreated plots. Sprays can be applied, however, with good results when air currents are too strong for effective dusting.

Effective Materials

A variety of insecticides has proved effective against certain cotton pests. In an 8-year test, toxaphene and a BHC-DDT mixture have given excellent control of the three most important insects—boll weevil, bollworm, and cotton aphids. Dieldrin-DDT and endrin also have given good results, although tested for a shorter period. Aldrin-DDT and heptachlor-DDT mixtures will control boll weevil and bollworm. However, use of these two mixtures may result in a build-up of cotton aphids. All of these compounds are recommended for use on cotton in Alabama; none will control spider mites.

New, Promising Insecticides

Several new compounds offer considerable promise as controls of cotton insects. Among these are Bayer 17147 (a benzo thiazine derivative of a dithio phosphoric acid methyl ester), methyl parathion, and chlorthion. Bayer 17147 was highly effective against boll weevil in preliminary experiments. It was a fast killer and remained toxic longer than toxaphene (residual). Although less residual, methyl parathion and chlorthion will control cotton aphids and spider mites in addition to boll weevil. Chlorthion is low in toxicity to warm-blooded animals.

AVERAGE YIELD OF SEED COTTON ON AREAS TREATED WITH TWO INSECTICIDES, 1947-54

Treatment	Trials	Yield per acre	Yield increase over check*	
	Number	*Pounds*	*Pounds*	*Per cent*
Untreated check	73	1,202	----	----
BHC-DDT	73	2,044	842	70.0
Untreated check	123	1,093	----	----
Toxaphene	123	1,925	832	76.1

* The average yield increase from use of calcium arsenate was 39.1%, 1924-43.

COTTON INSECTICIDES— Are of Little Value If Not Properly Applied

T. E. CORLEY, C. M. STOKES, F. A. KUMMER
Department of Agricultural Engineering

COTTON INSECTICIDES are of no value unless they are properly applied.

Entomologists have determined the proper rates, time, and frequency of application for most effective control for the many different insecticides. Selection, adjustment, and operation of equipment is important in order to apply the insecticides recommended by the entomologists.

Sprayers and dusters are the two general types of application equipment used. Tests have shown that spray and dust are about equally effective for cotton insect control. (See opposite page.) Each method of application has its advantages and disadvantages.

Advantages of Spray Method

Sprays can usually be applied throughout the day, but effective dust application is often restricted to early morning, late evening, or night hours when there is little or no wind. The longer working time with a sprayer permits poisoning of more acres per day and increases the chances of being able to poison on schedule.

Spraying equipment has possibilities of much wider use than dusting equipment. It can also be used for spraying livestock, chicken houses and other insect-infested areas and for applying pre- and post-emergence chemicals for weed control in cotton. The same equipment used for spraying cotton should not be used to apply 2,4-D, 2,4,5-T, and similar materials.

With increasing use of pre- and post-emergence chemicals for weed control in cotton, more sprayers will become available for insect control. A sprayer may not be economical for small acreages of cotton unless it can be used for other purposes.

Spray application is less objectionable to the operator than dust application. Dust applied during calm weather may remain suspended in the air and become objectionable to the tractor driver throughout the dusting operation, whereas spray will settle quickly on the plants.

Disadvantages of Spray Method

One disadvantage of spray application is that the farmer must mix his own spray in correct proportions. The amount of diluted spray for effective control may vary considerably (from 1 to 10 gallons per acre for cotton) as long as the correct amount of technical material is applied.

Mixing the concentrate with water in correct proportions is relatively simple if the strength of the concentrate and the amount of spray applied by the sprayer are known. Strength of the concentrate is marked on the container and is usually expressed in pounds of technical material per gallon.

The volume of spray applied per acre can be determined by catching and measuring the solution from a nozzle while the equipment is operated over a measured distance under conditions similar to those that will prevail during actual spraying.

Volume of spray applied depends on size of nozzle opening, speed of tractor, and pressure used. The tractor speed, pressure, or nozzle opening can be changed to get the desired volume. If a large change in volume is necessary, the size of nozzle opening rather than tractor speed or pressure should be changed. The pressure should be maintained between 30 and 60 pounds, and the tractor operated at the most satisfactory speed.

Spraying at low rates is most economical because less time, labor, and water are required, but as the nozzle opening is decreased for lower rates, the chances of clogging increase. Applying 5 gallons per acre has proved satisfactory with ground equipment.

Another disadvantage of sprayers compared with dusters is the larger number of troublesome parts. A sprayer has such parts as nozzles, strainers, hoses, a pressure gauge, and a pump that cause trouble by clogging, corroding, and rusting.

Tractor Wheel Shields

Damage to cotton by tractors and other equipment used in applying insecticides may be quite serious, especially during late season application in large plants. Because of this damage, many farmers stop poisoning before the crop is mature.

Tests have shown that the late applications are often the most important. Damage can be reduced by using tractor wheel shields, 6- to 8-row equipment, and sprayers and dusters with high clearance.

Control of insects is important because high yields are necessary for efficient and economical mechanical harvesting. Nearly as much time is required to mechanically harvest an acre of low-yielding cotton as an acre of high-yielding cotton. Also, insect-damaged bolls reduce harvester efficiency.

*Cooperative study with Farm Mach. Div., Agr. Engin. Res. Br., A.R.S. of U.S.D.A.

Tractor sprayer rig equipped with wheel shields to reduce injury to plants.

SEED TREATMENT Protects Seedling Oats Against Disease *and* Results *in* Better Stands

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

CHEMICAL seed treatment has become a standard practice in the production of many major crops. It should also become a standard practice for oat production.

Good seed germination of oats is only the first step toward getting a good stand. Many harmful organisms exist on the seed and in the soil, ready to attack the young plants as soon as the seed begin to sprout. These organisms cause seed rot, seedling blight, damping-off, and other diseases.

Oats, Important Crop

Winter oats is one of the most satisfactory pasture, and grain, hay, and winter cover crops for the entire State. This is especially true with the better adapted varieties now available. Since oats are generally considered to be one of the best crops that will give early fall and winter grazing, any economical practice that increases the productive efficiency of this crop should be followed. Seed treatment would be classified as such a management practice.

Seed Treatment Tests

Seed treatment tests with oats have been conducted during the past 2 years at substations of the API Agricultural Experiment Station throughout the State.

Five chemical seed protectants were used. These were Agrox, Ceresan M, Orthocide 75, Panogen, and Vancide 51. Each material was applied to oat seed at the rate recommended by the manufacturer. The oats were seeded at the rate of 2 bushels per acre.

In general, Ceresan M was the most effective seed protectant used. This material also was the most effective one used in greenhouse and laboratory tests. The difference in laboratory germination of untreated and Ceresan M-treated oat seed is illustrated in the accompanying photo.

Treatment of seed with chemical protectants results in increased field stands of oats in two ways: (1) the chemicals kill seed-borne diseases, and (2) they protect the seed during germination from soil-infesting disease organisms.

Ceresan M and other organic mercurials have proved to be more effective for oat seed treatment than other types of chemical seed protectants. These chemicals give off fumes that penetrate the hulls of oat seed and kill the organisms underneath. This was demonstrated in both greenhouse and laboratory tests, where Ceresan M was very effective for control of Victoria blight, the most serious seedling disease of oats in Alabama.

Many factors such as weak seed, unfavorable weather, and unfavorable soil conditions may affect the oat stand obtained from any seeding. Seed treatment provides protection against only seed-borne and soil-borne organisms. If these organisms are not present, or are not active, seed treatment will not increase the stand.

Laboratory tests have shown that seed treatment neither increases nor reduces the natural germinability, viability, or vigor of oat seed. Furthermore, stands from the same lot of seed may vary in different parts of the same field, regardless of treatment or no treatment.

Are Protectants

Seed-treating chemicals are not fertilizers or nutrients. They do not stimulate or speed up germination and growth. These materials merely protect the seed against certain disease organisms and substantially improve the chances for survival of each seedling. Very often the protection given weak seeds by chemical treatment will enable them to germinate and produce seedlings, which they could not do without seed treatment. As a result, fewer failures to get a good stand of oats occur and fewer irregular stands are obtained.

Oats on right germinated better than those on left because they were treated with Ceresan M, killing the seed-borne organisms.

Costs and Advantages

The cost of seed treatment varies with cost of material, rate of application per bushel, and amount of seed used per acre. It may range from 1½ to 20 cents per bushel.

Seed treatment is worth many times what it costs. Advantages of seed treatment are:

(1) It destroys seed-borne organisms that cause plant diseases.

(2) It checks organisms in the soil that rot the seed or kill the seedling.

(3) It results in better quality grain by eliminating seed-borne diseases that shrivel and otherwise damage the kernels.

NO STOOP - NO SQUAT!

V-Type Parlor Cuts Milking Time 25% per Cow

J. H. YEAGER, MORRIS WHITE, and B. F. ALVORD
Department of Agricultural Economics

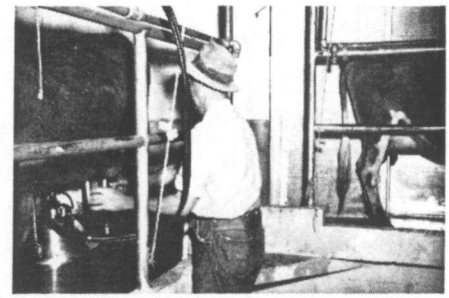


Fig. 2. Almost no stooping or squatting was necessary in the V-type milking parlor, which cut labor 25%.

How much of the disagreeable work usually required for milking cows can be eliminated?

The answer is found in the results of a study conducted in 1953 comparing dairy chores in a stanchion-type barn with those in a V-type milking parlor on the cotton-dairy management unit at the Sand Mountain Substation, Crossville.

These results show that stooping and squatting to wash udders and attach milkers is eliminated and walking distance normally required in a stanchion barn is reduced in the milking parlor.

Stanchion Barn

Prior to 1953, the herd of 12 cows was milked in a barn with eight stanchions, Figure 1. One man did all the chores and a single-unit milker was used. Milk was carried to the milk room, a distance of about 25 feet from the center of the milking area.

An average of 9½ minutes and nearly 200 feet of walking per cow (including 24 feet for calf feeding) were required for all dairy chores per milking. (See table.)

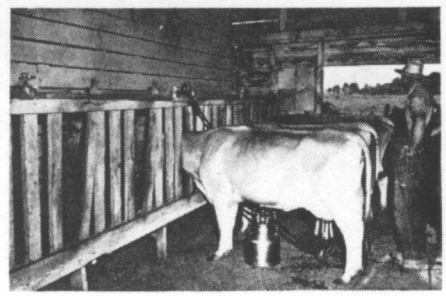


Fig. 1. Nearly a third of the time for milking in the stanchion-type barn was spent in stooping and squatting.

Milking Parlor

In the latter part of 1953, a two-stall, V-type milking parlor of concrete block construction was built at a total cost of $1,750. This building has a feed room, milk room, and milking area. The two stalls are 29 inches above the floor on which the worker stands, Figure 2. Cows enter the stalls by a single door from a covered holding pen. The door for entry and the two doors for exit are controlled by ropes.

Milking in the parlor is done by the same man who milked in the stanchion barn, and the single-unit milker is used.

An average of 7.1 minutes and 136 feet of walking per cow are required for all dairy chores per milking in the parlor. (See table.)

Comparison of Time and Walking Required for Milking Cows in a Stanchion Barn with that Required in a Two-Stall, V-Type Parlor

Item	Average per cow per milking			
	Stanchion barn		Two-stall, V-type parlor	
	Time	Distance walked	Time	Distance walked
	Minutes	*Feet*	*Minutes*	*Feet*
Preparation for milking	.8	2	.6	6
Turn cows in, feed concentrates, and turn cows out	.5	44	.9	27
Wash udder	.3	11	1.0	22
Wash and dry hands	----	----	.2	13
Forestrip	.4	8	----	----
Milker on cow	(3.2)	----	(3.9)	----
Machine strip	.7	----	.7	----
Carry milk to milk room, weigh, pour up, and record weight	1.4	68	.9	51
Idle time	.7	----	.7	----
Treat for mastitis	1.7	14	----	----
Wash utensils, milk room, and milking area	2.1	16	1.2	12
Miscellaneous jobs	.9	36	.9	5
Total	9.5	199	7.1	136

Comparisons

Elimination of stooping and squatting is one of the most important advantages of milking cows in elevated stalls. Milking in the stanchion barn required work in a squatting or stooping position nearly one-third of the total time, whereas almost no stooping or squatting is necessary in the parlor.

On an annual basis, 116 man hours and a walking distance of 27.5 miles per cow (including 3.3 miles for calf feeding) were required in the stanchion barn. In the parlor, 86 man hours and a walking distance of 18.8 miles are required per cow per year. This amounts to a saving of 25% in labor and 31% in walking distance.

Very little mastitis has occurred since milking was begun in the parlor. Possibly a better job of washing udders and cleaning up is being done. Time requirement for washing udders is greater than in the stanchion barn. However, less time per cow is used in washing utensils, the milk room, and the milking area.

Time between washing udders and attaching milker also is less in the parlor. In the stanchion barn, several cows were prepared for milking before the milker was attached to the first cow. Time for eating concentrates is ample in the parlor.

Although a number of improvements could have been made in the physical layout and the routine used in the stanchion barn, only elevated stalls would have eliminated the stooping and squatting.

THIRTY YEARS RESEARCH—

Has Provided Timber Owners Better Methods *for* Higher Returns

W. B. DeVALL, *Head, Department of Forestry*

At Auburn stands a pine plantation on an area that 28 years ago was eroded land. Impressive is the lesson taught thousands of visitors by this living example of land reclamation with planted pines.

During 30 years of forest research by the API Agricultural Experiment Station, tours of the experimental plots have played a major part in the spread of new forestry information.

In 1927, slash, loblolly, and shortleaf pines were planted on badly eroded, abandoned farm land at Auburn. Today—28 years later—the slash and loblolly plantations are ready for a third thinning. The shortleaf pines, however, have not yet reached pulpwood size.

Guide to Early Planting Programs

Early planting programs in Alabama were guided by results obtained at Auburn. Tree planting work on public lands, followed by reforestation on cutover and abandoned private lands, has been highly successful because only the best recommendations were followed.

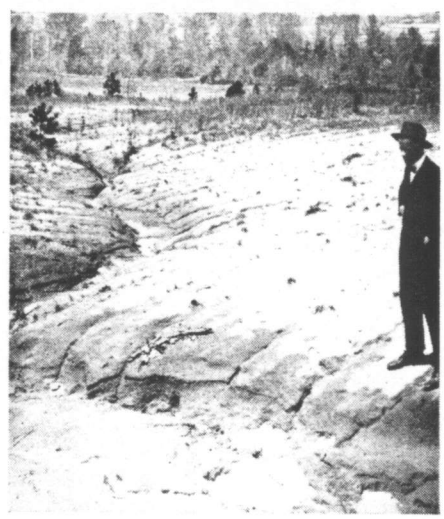
Studies at Auburn showed that black locust, a desirable erosion control species in some areas, was essentially a failure. Catalpa failed when underplanted in pine plantations.

Results from tests in which different pine species were planted in alternate rows showed that the most vigorous species survived competition; others died. Alternate rows of hardwood and pine likewise were unsuccessful. Differences in rate of height growth and in pine tolerance caused most combinations to be unsuited.

Since large areas of land in Alabama support low grade hardwoods, experiments were begun at Auburn to determine ways of converting such lands to pine by underplanting. Many visitors have seen and have been guided by the results of this successful work.

Fire is Worst Enemy

Fire, the No. 1 enemy of forest lands, has been studied since 1926. The contrast between an acre burned annually for 29 years and an unburned acre is very marked. Growth of pine stands, both natural and planted, has been studied in the Lower and Upper Coastal Plains and in the Piedmont Area. With the exception of young longleaf pine during its first 3 to 5 years, fire has limited the growth of pines. An excellent example on the Lower Coastal Plain Substation shows that establishment of young longleaf pine stands depends on proper use of fire as a management tool. Slash pine, on the other hand, cannot tolerate fire.



Above is the eroded, abandoned farm land near Auburn that was planted to pines in 1927. At right is the same area 22 years later before second thinning. Per acre thinnings totaled 17¼ cords of pulpwood, with 16¼ cords remaining as standing timber. At age 25 (1952) total growth was 33½ cords per acre, or about 1-1/3 cords per acre per year from worn out land.

Provides Know How

The first 20 years of research with planted pines by the Agricultural Experiment Station established much "know how" and several production goals for land devoted to growing trees. Growth in excess of 1 cord of pulpwood per acre per year can be obtained. Expressed in another way, more than 2,000 pounds of wood fiber per acre per year can be grown in planted loblolly pine stands, spaced 6 by 6 feet. In 20 years, an initial planting investment, carried at 4% compound interest, can earn between 6 and 12%, depending on the species and spacing.

When properly managed, pine trees have earning power that is comparable to the best financial investments. For example, a pine tree measuring 6 inches in diameter at 4½ feet above the ground and growing 2 inches in diameter every 6 years is earning 12% compound interest. This return from 300 to 500 trees per acre gives an idea of the value of properly managed trees.

Forest research must be at least 10 years ahead of application. With the plantations at Auburn 28 years old, the story of planted trees and progress of research is being told every year to visitors representing farm interests, banking and investment companies, and forest products industries.

FREEZE 'EM! Surplus Eggs Can Be Processed *for* Home Use *and for* Market

J. G. GOODMAN, *Associate Poultry Husbandman*

How to use or what to do with extra eggs eventually becomes a problem of every poultryman.

Obviously, all surplus, cracked, or odd-shaped, extremely large or small, or shell-less eggs, and eggs with meat or blood spots cannot be used immediately by the average poultryman. Neither can they be marketed profitably. However, such eggs can be frozen for future home use or for the market.

Since 1947 the Agricultural Experiment Station of the Alabama Polytechnic Institute has conducted research on freezing eggs. Two methods of preserving eggs by freezing have evolved from this research: (1) special treatment of whole eggs before freezing, and (2) emulsification of eggs before freezing.

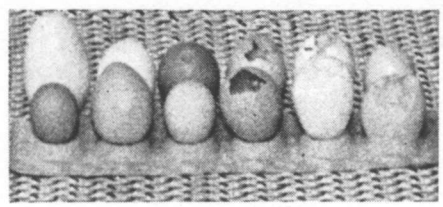
Eggs preserved in a home-freezer or freezer locker retain their flavor and edible quality much longer than those preserved at home in any other way. The method used most often on the farm is to emulsify the eggs and then freeze them. However, the housewife who wishes to preserve the whole egg – yolk and white intact – finds emulsifying undesirable.

The greatest problem in freezing whole eggs individually is maintaining the quality of the yolk after thawing. Egg yolks that have been frozen do not return to their original consistency after thawing but are gelatin-like and gummy.

Special Treatment Before Freezing

Results of research by the Agricultural Experiment Station show that much of the original quality of the yolk may be retained if whole eggs are given a special treatment before freezing. In most instances, the thawed eggs will be of satisfactory quality for cooking. Although the method is slow and tedious, it has merit for those who wish to preserve individual whole eggs. Briefly the procedure is as follows:

1. Break freshly laid eggs and remove from the shell.



Types of surplus eggs that can be easily frozen for home use and for market.

2. Soak each individual egg in a 20% saline (salt) solution for 20 minutes. Use small containers so that each egg is well covered with the solution. Gently twirl the containers several times to make sure the solution is around all the eggs.

3. Remove the eggs from the solution. Care should be taken to remove any excess salt solution. A fine-mesh small sieve is suitable for this purpose.

4. Package each egg in an individual container. Be sure the egg is tightly packaged.

5. Freeze the eggs at minus 10° F. or lower. Store at normal freezer temperature, 0° F.

Emulsified Frozen Eggs

A very satisfactory method of preserving eggs is to emulsify and freeze them. Procedure for this method is as follows:

1. Break fresh, clean, sound eggs into small dishes to make sure they have no off odors.

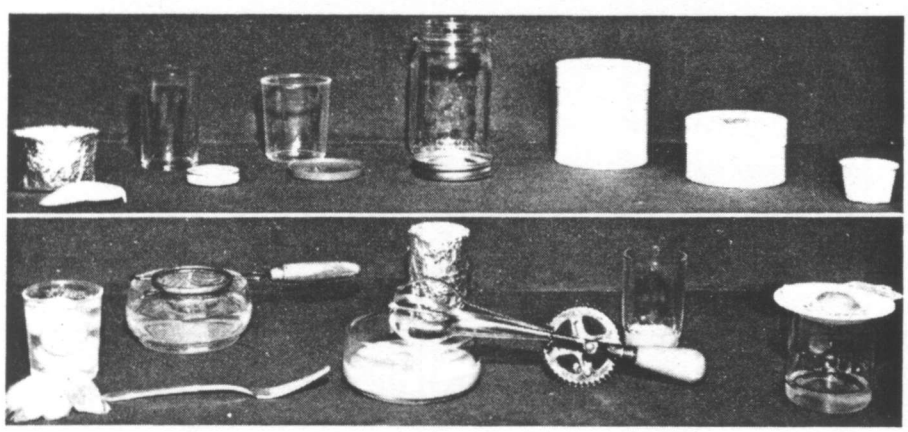
2. Pour the broken eggs into a bowl or other suitable container and emulsify with a fork, hand beater, or electric churn beater. Beat just enough to mix yolks and white without incorporation of air. Low-speed beating is best. (If the yolks and whites are separated, it is not necessary to beat the whites because the thawed whites will have as high quality as fresh ones. However, the yolks must receive the same treatment as whole eggs.)

3. Add a stabilizer to the eggs as they are beaten to prevent the gumminess in thawed yolks. Readily available stabilizers are sugar, corn sirup, honey, and salt. Add 3% sugar, corn sirup, or honey, or 1% salt, to the mixed eggs to improve yolk quality.

4. Store the emulsified whole eggs or separated yolks and whites in suitable containers of the desired sizes.

The frozen eggs should be used soon after thawing. Therefore, the size of containers for packaging will depend on quantity to be used.

Care in defrosting frozen eggs is necessary to retain the best qualities of the processed eggs. Frozen eggs have certain advantages over shell eggs, especially for large-scale use. They are a uniform product, and there is less loss in quality during storage than with shell eggs.



Above: Sizes and types of containers satisfactory for storing frozen eggs. Below: equipment for mixing small amounts of eggs for freezing; for larger quantities, an electric mixer can be used.

BELIEVE *in* SIGNS?

Discolored Camellia Leaves Indicate Deficiency of Plant Nutrients

H. P. ORR, *Associate Horticulturist*

WHAT ARE the characteristic symptoms of nutrient deficiency in camellia? Both commercial and amateur growers have long been puzzled by the variations in growth and appearance of the camellia plant.

Is a certain coloration or discoloration a sign of healthy or diseased condition? Is such condition the result of nutrient deficiency or excess of nutrients? Or, is the difficulty some physiological disorder?

A study of the nutrient deficiency symptoms of Camellia japonica was begun by the API Agricultural Experiment Station in 1949.

During the first year, few differences were apparent in rooted camellia cuttings growing in different nutrient-deficient media. Enough stored food may have been present in the cuttings to sustain desired growth characteristics for a short period. This may often be true when camellia plantings are established on infertile areas.

More of the "described deficiencies" began to appear in the second year. Leaves either dropped as chlorosis developed throughout the leaf or dropped after partial chlorosis and severe sunburning. At the end of the 2-year period, only the plants getting a complete nutrient solution and a solution deficient only in potassium were growing.

Deficiency symptoms most often observed on camellia plants in Alabama are those of nitrogen, iron, and magnesium. Nitrogen deficiency is common on plants growing in light, sandy, nonorganic soils where light, infrequent fertilization is practiced. Iron chlorosis is often observed on plants growing in slightly acid soils. Magnesium deficiency is common on plants in sandy, acid soils.

Fertilizer studies at Auburn indicate that camellia plants develop satisfactorily in a well-drained, organic-containing soil with a pH of 5.0 to 6.0. Best growth resulted when a fertilizer containing approximately 6% nitrogen, 10% phosphoric acid, and 8% potash was applied.

On a 100-square-foot basis, two applications of 2 lb. each of a 6-8-4 fertilizer should be made, the last applied in June. This rate amounts to ½ cupful of the fertilizer per 3-foot plant.

DEFICIENCY SYMPTOMS OF CAMELLIA JAPONICA

Deficient element	Symptoms	
	Growth	Foliage
Nitrogen	Weak, spindly	Uniform yellow coloration, foliage small
Phosphorus	Weak, spindly, short	Dark green
Calcium	Progressively smaller	Top leaves begin to break down
Magnesium		Orange-yellow chlorosis on older leaves
Zinc	Slow rate	Clear necrotic spots, some chlorosis
Iron		Pure white chlorosis on young foliage
Copper		Necrosis and white mottling of young foliage
Manganese		Yellow-orange chlorosis of young foliage
Boron		Orange-yellow chlorosis, sheaths of terminal buds die
Sulfur	Very short internodes	All foliage light yellow

New and Timely PUBLICATIONS

Listed here are new and timely publications reporting results by the Agricultural Experiment Station:

Bul. 293. Production Practices of Commercial Egg Producers in Alabama is a report of replacement, feeding, housing, and labor practices in Alabama.

Leaflet 46. Control of Leaf Spot and Strawberry Weevil on Trailing Blackberries.

Leaflet 47. A Comparison of Protein Supplements in the Wintering Ration of Beef Steers.

Progress Report 52. Three Years' Results from Creep Feeding Experiment, Black Belt Substation, 1952-54.

Progress Report 53. Results of Experiments with Crossbreeding of Beef Cattle, Black Belt Substation.

Progress Report 54. Cost Comparisons of Johnsongrass Silage and Hay, Black Belt Substation, 1953-54.

Progress Report 55. Summary of a One-Year Test on Cost of Producing, Harvesting, Storing, and Feeding Caley Pea Silage, Black Belt Substation, 1954.

HIGHLIGHTS *of* AGRICULTURAL RESEARCH

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E. V. Smith, Director
Auburn, Alabama
Permit No. 1132—5/55-8M