The New John Deere Research and Engineering Center Keeps Tractor Quality at Its Highest

Quality is a particularly precious commodity in the farm equipment industry. From quality stems the faith and subscription that make one manufacturer's product more acceptable than another's. Tractors are a good example. At John Deere, tractor quality is guarded with a vengeance. The words of the blacksmith, spoken more than a century ago, still ring loud and clear—"I'll never put my name on an implement that hasn't in it the best that is in me."

To this end, a year-round program of research and testing is carried on in this modern John Deere Research and Engineering Center near Waterloo, Iowa. Here, through the media of the test tube and test track, with the aid of modern electronic and mechanical testing devices, the science of agricultural engineering and development pursues the goal of ever-higher tractor quality. The success of this program is evident by the growing number of John Deere Tractors that are a familiar part of every rural landscape. The important role played by the new Research and Engineering Center is another "built-in" feature that makes the John Deere dealer franchise the most valued in the farm equipment field.

This obstacle course subjects test tractors to punishment far in excess of that encountered in normal field operations. Any weakness can be quickly spotted and corrective steps taken.

This mud bath, in which can be mixed varying amounts of sand and clay, enables John Deere engineers to check the effect of water and abrasives on wheel and axle bearings and oil seals.
AGRICOLAN PHILSOPHY

For some time there has been a need for an organization that would unify the students of agriculture as a group. At last there is being formed such an organization—a council composed of representatives from all student agricultural clubs. Departments which have no departmental club will also have a representative.

There are eleven organizations within the School of Agriculture at the present—does the need exist for this additional organization? The answer is definitely yes—partly by virtue of the fact that there are so many at the present. A principal function of the council will be to coordinate the activities of the various clubs. This council may become very powerful, but it will never take the place of the other agricultural clubs. It may become very strong, but it will never lessen the strength of its constituent organizations. In fact, it should serve to strengthen them.

Many of the present organizations are very active, but the scope of their activities is limited by their size. However, by working together through a council, the resources of all these clubs could be pooled in the execution of a more comprehensive project. An important project of the council could be publicizing and promoting Clemson's School of Agriculture. Many prospective college students—and many students already enrolled in college—may not realize how rewarding a college education in agriculture is. Nor do they realize how many job opportunities are available to the agriculture graduate. The council could do much to inform these people of the true meaning of a college education in agriculture. Another important function would be to advise the Dean of the School of Agriculture in matters pertaining to student affairs.

The concept of an agriculture student council is not new—such councils are operating successfully in many colleges throughout the nation. Their activities aren't all work and no play, either, for many sponsor such social projects as dances, agricultural school days, and picnics. How strong the agricultural student council at Clemson will be depends entirely on student support. The students will determine the nature and success of its activities.

—G. E. S.
SERVING THE FARMERS IN NORTH AND SOUTH CAROLINA SINCE 1906

Planters Fertilizer & Phosphate Co.

CHARLESTON, S. C.    CHARLOTTE, N. C.
Did you ever consider how a glass of milk, which you just had for dinner in the dining hall, was processed? It is quite an interesting story that can best be started at its beginning, the cow.

The cows at Clemson are milked by mechanical milkers in a sanitary dairy barn. The milk from each cow is weighed after each milking, which occurs twice daily. Only milk from healthy cows is used for human consumption. All cows at Clemson have high production records, except those cows that may be held for experimental purpose in spite of their low production. The feeding of good quality concentrates and roughages is one of the factors responsible for a high quality milk.

Immediately after each cow is milked, the milk is pumped over a surface cooler which reduces the temperature of the milk approximately 35°F. After cooling, the milk flows into an insulated, stainless steel tank truck, where it is stored until all the cows have been milked. At this time it is transported to the modern dairy manufacturing plant located in the south wing of the Food Industries Building.

On arrival at the plant the milk is pumped out of the truck tanker through a clarifier and into a refrigerated stainless steel storage tank. After the milk is received in the plant it is ready to be pasteurized. Even though the raw milk is produced by healthy cows under sanitary conditions, pasteurization provides further assurance for the consumer that he is drinking a safe, wholesome product. The pasteurizer at Clemson is the second one of its kind to be installed in the United States and the first to be installed in a college. It is a Vacu-Therm pasteurizer which has the operating ability for standardizing the flavor of milk.

The Vacu-Therm pasteurizer consists of a series of heat transfer plates equipped with two vacuum chambers. The flow of milk through this high-temperature short-time machine is as follows: the raw milk is drawn by vacuum through a preheater into the first vacuum chamber. In this preheater the temperature of the milk is increased from 40°F to 138°F. The heating medium in the preheater is hot pasteurized milk. A stainless steel plate keeps these milks separated. While the milk is in the first vacuum chamber, the non-soluble gases are removed.

A positive displacement pump draws the milk from the first chamber and pumps it through the heating section of the heat exchanger. Steam under reduced pressure is the heating medium. The heat of the steam passes through a stainless steel plate and into the milk in this section. The milk on leaving the heating section flows through a stainless steel tube with a sensitive thermometer located in a flow diversion valve. If the temperature of the milk were not 161°F, which is the temperature of pasteurization, the valve will divert the heated milk and cause it to flow back to the raw milk side of the pasteurizer. The functioning of this valve assures proper pasteurization.

After the milk is properly pasteurized, it flows into the second vacuum chamber. This chamber is maintained at reduced pressure; therefore, the hot milk flashes immediately to the corresponding temperature of that vacuum. This change in temperature causes the volatile substances, such as off flavors, if present, to be removed from the milk. This improves the flavor and tends to produce a standardized flavor of the milk. The vacuum treated milk is pumped from the second vacuum chamber to a homogenizing machine. The homogenizer breaks up the particles of butterfat into smaller units. These small units of butterfat do not cream in milk; therefore, all portions of the milk contain equal amounts of the fat.

(Continued on page 14)
Etiwan Fertilizer Co.
CHARLESTON, SOUTH CAROLINA

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—Manufacturers Of—
DEPENDABLE FERTILIZERS SINCE 1868

Dan's
For the BEST in Hamburgers and all types of Sandwiches

CLEMSON
SOUTH CAROLINA

L. C. MARTIN DRUG COMPANY

Clemson,
South Carolina
Presenting . . .

At the mike is J. R. Mattison, director of the "Voice of Clemson" programs.

Mr. J. R. Mattison (better known as Bob) of the Clemson College Extension Service presents the daily radio program known throughout South Carolina and adjoining states as the VOICE OF CLEMSON. Thousands of farm people and others affiliated with agriculture await with much interest the familiar greeting—"Hi there everyone, this is THE VOICE OF CLEMSON coming to you from our Clemson House Hotel!" Bob's friendly and informal discussion has to do with things of interest in agriculture. The aim is to break down the technical aspects of today's agriculture in a simple everyday language so all can understand and thus reap the benefits of the research work. The program varies each day as specialists in the field of agriculture and home economics assist him in answering questions concerning the problems of the farm and home.

Mr. Mattison's childhood experiences on a Pickens County farm inspired him to serve the farm people of this state. He began his work with Clemson College as an assistant in the Botany Department while in high school. He later enrolled at Clemson to major in Entomology and Zoology. He received his B.S. Degree in 1935. After graduation he became Assistant Professor of Bacteriology. Most of his time, however, was spent in research study on cotton diseases. In 1937 he moved to the Pee Dee Experimental Station where he did research work in all agricultural crops with his main interest in tobacco. He had charge of laying out the plots for the first tobacco experimental station.

In 1946 Mr. Mattison returned to Clemson to continue research and developmental work with aromatic tobacco. He began his radio work with the Extension Service in 1952. Today the radio program demands most of his time but he is still affiliated with Clemson's tobacco developmental work. Besides the many farm programs he originates for radio, he also assists with athletic interviews for radio stations, and announces the high school, college freshmen, and the varsity athletic contests held at Clemson. The radio programs he presents are far reaching in the effort to be of service to South Carolina farm people as well as adjoining states. North Carolina and Georgia radio stations carry the Clemson program. There are 65 radio stations in South Carolina now carrying appropriately 22 programs each week. Mr. Mattison is looking forward to the time when Clemson College will telecast THE VOICE OF CLEMSON program directly from the new and modern Plant and Animal Science Building. Clemson's own television station may not be too far in the future. Modern radio and television studios have been built in the Agriculture Center.

Mr. Mattison does not limit his work to farm people and the numerous athletic events. Much of his time is spent assisting college students, the faculty, and the departments with special radio programs.

Mr. Mattison is a Methodist, but attends the Baptist Church with his family. All in all, he is a high type farm boy with an unusual interest in farm people and their problems. He is typical of the outstanding men and women working in the Extension Service. Bob Mattison's dedicated life for service to others in agriculture expresses his love and devotion for rural life.

Now being better acquainted with Bob Mattison, I am sure we will all lean closer to our radios for this up-to-the-minute report on agriculture progress as the air waves sound the familiar greeting — "HI THERE EVERYONE, THIS IS THE VOICE OF CLEMSON."
A New Threat To Corn - - -

WITCHWEED

By

Richard H. Holstein, III, Agron '59

Farmers of South and North Carolina have found a new menace to their corn, sugarcane, sorghums, many of their grasses, certain sedges, and some broadleafed plants. Witchweed (Striga asiatica) has established itself as quite a threat on the coarse textured and sandy soils in several of the counties of the Carolinas. The counties affected in South Carolina are Dillon, Horry, Marion, Marlboro, Darlington, and Florence.

Reports of a mysterious disease were first made in August 29, 1951. The diseased plants had symptoms similar to those inflicted by drought. In July 1956 some of the affected corn plants were sent to North Carolina State College for examination. It was there that a graduate student from India directed attention under stem roots of the genus Striga, which resembled stems that attack sugarcane, in the Eastern Hemisphere. After this discovery the plant was soon found to be the parasitic witchweed.

Due to the destructive potential of this parasite, Agronomists and botanists immediately initiated research programs to provide knowledge in an effort to bring about the control or eradication of the parasite.

However, there is a major difficulty involved in research. The genus Striga has heretofore been known only in Africa, Asia, and Australia. The first job for the scientist will be to determine whether or not the growth habits in this continent are the same as in the countries they have previously plagued. A method for control under U. S. conditions is the goal of the Agricultural Research Service.

The witchweed is a deceptively pretty plant, with bright green stems and leaves and showy red flowers having yellow centers. The blossoms are shaped somewhat like violets. The weed usually ranges in size from 6 to 12 inches, and occasionally it reaches a height of 18 inches. It has multiple branches, both near the ground and higher on the plant. The leaves are long, narrow, and fuzzy in appearance. They are in pairs oppo-

site each other on the stem, which also has a fuzzy appearance. As the stem grows and branches, more flowers come to bud, and the plant continues to bloom and produce seed pods throughout the season. A single plant in the span of one season can produce 50,000 to 500,000 tiny seeds, which can barely be seen by the naked eye. These seed can lie dormant for as long as 20 years awaiting a suitable host.

As a rule, the witchweed seed generally require a rest period of 15 to 18 months before germination; however, some begin to develop before this period is over. The host plant produces a chemical referred to as a "host extract" which initiates the germination of the witchweed seed. The fact that the seed have to be as close as three or four millimeters to the root before germination is no problem to the parasite because of the many seeds that are in the ground and the large network of roots and root hairs of the host. The "host extract" not only serves as a stimulant to witchweed germination, but also serves as a guide for the parasitic roots to the roots of the host.

When the witchweed seedling starts to grow, it must contact, attach to, and penetrate the roots of a host. Otherwise it dies.

Flowering begins about 20 days after the seedling emerges, the first flowers appearing at the base of the plant. Four weeks after flowering the seed pods burst, and thousands of tiny seed are released to continue the life cycle. The time from germination until the release of seed is about 90 to 120 days.

The first symptom of witchweed infestation is the wilting of the crop. Gradually the parasitic roots make more penetrations and the plant appears to be drought stricken. The plant first turns yellow, then brown, and sooner or later, depending upon intensity, dies.

The first years of infestation are so light that very little attention is given to it. But each year the damage is compounded, and the corn grower finds himself in quite a serious situation. In the Anglo-Egyptian Sudan losses have been reported as high as 66 per cent, and a loss of 25 to 33 per cent is very common. A scientist making a survey of insects and other pests of corn in Mozambique, southeast Africa, is quoted as saying, "Witchweed is the worst enemy of corn."

Witchweed prefers the coarse textured or sandy soils, but it is by no means confined to this type soil. It has been known to thrive in the heavy clay of the Anglo-Egyptian Sudan.

The soils of the county known to be infested lie within the Norfolk-Ruston soil group, which is comprised mostly of soils ranging from coarse sands to fine sandy loams.

(Continued on page 14)
First in the nation . . .

CLEMSON'S NEW GINNING ENGINEERING PROGRAM

By

J. K. Merck, Ag. En. '58

There are many “firsts” in the history of cotton. Ancient records unearthed in the ruins of the city of Mohenjo-dare in the Indus Valley of India indicate that these ancient Indians were the “first” to successfully gin cotton with a cotton gin. Now Clemson College can boast a “first” in the cotton industry. Clemson College is the first college in the United States to offer a graduate course in ginning engineering.

This brings to mind the question—“What is Ginning Engineering?” Briefly, ginning engineering is the application of engineering principles to the processing and ginning of seed cotton. Processing and ginning include all these operations which expedite the separation of the seed from the lint. Some of the more important operations in this process are drying, cleaning, bur extraction, and lint cleaning.

The need for instruction in ginning engineering has been seen for a number of years. The program was organized in the Agricultural Engineering Department and was made possible through the joint efforts of Clemson College and the National Cotton Council. Completion of the program leads to a master of science degree in Agricultural Engineering with concentration in ginning engineering.

Two new courses in Agricultural Engineering are being taught specifically for the student pursuing the engineering concentration. The basic course, entitled “Fundamentals of Ginning Engineering,” is available to both undergraduates and graduates. In this course an engineering analysis is made in all phases of ginning such as handling, storage, drying, separating lint, cleaning, pressing, disposing of foreign matter, quarantine treatment, power requirements, and safety precautions.

The advanced course, entitled “Advanced Ginning Engineering,” is organized at the graduate level. Since this course is for graduate students only, the problems studied are more specialized and complex. Emphasis is placed on design, development, analysis, and synthesis of gin machinery to meet the functional requirements necessary for processing and handling cotton in a modern gin establishment. Materials handling, air requirements, horsepower requirements and layout design are specific problems in cotton technology. Class problems are assigned for a term problem.

Presentation of a thesis is required by all candidates completing the ginning engineering program. The selection of the thesis problem is left to the student; however, the problem must be approved by the student’s advisory committee.

Facilities at Clemson for carrying out the ginning engineering program include: The Southeastern Cotton Ginning Research Laboratory, School of Engineering, School of Agriculture, School of Textiles, the Cotton Fiber and Spinning Laboratory, and the Division of Technical Services of the American Cotton Manufacturers’ Institute, Incorporated.

At present, there are seven students enrolled in the basic course. Four of these are graduate students, of which three are on fellowships provided by the Murray Gin Company, and the Clayton Fund. These three fellowships are provided each year to help interested students pursue the ginning engineering program. The undergraduates enrolled in this course are seniors majoring in Agricultural Engineering, who are interested in ginning engineering. The graduate students will continue in the advanced course next semester.

Dr. J. H. Anderson, Associate Professor of Agricultural Engineering, is in charge of the ginning program at Clemson. Laboratories are conducted at the Southeastern Cotton Ginning Research Laboratory. This laboratory is headed by Mr. James A. Luscombe, United States Department of Agriculture.

(Continued on page 14)
BRIGHT FUTURE IN AGRICULTURE

The future of students in agriculture looks bright. The total undergraduate enrollment in agriculture in U. S. has decreased by 8,000 since 1948. This decrease in the number of students taking agriculture in college is leaving unlimited jobs open for every man graduating in agriculture. At the present trend, the number of open jobs will increase.

DAIRY TEAM JUDGES

Clemson's Dairy Products Judging Team placed fourth in overall team scoring at the Southern Dairy Products Contest in Athens, Ga.

Al Soudan was high individual of the Clemson team, and was followed closely by Morris 'Buddy' Bond and Ken Locher. The team coach is Dr. D. M. Graham, Associate Professor of Dairying.

BLOCK AND BRIDLE DELEGATES

Delegates from the Clemson Block and Bridle Club to the National Convention in Chicago in December were H. Todd Arant, Bowman, South Carolina, and P. C. Cochran, Manning, South Carolina.

NEW COURSE TO BE OFFERED

Agriculture 302, Agricultural Extension, is a new course to be offered for the first time in the second semester of 1957-58. The 2-credit course consisting of two class hours per week, with no laboratory, will be offered as an elective for juniors and seniors. It will be taught by Mr. M. H. Sutherland, Assistant in Farm and Home Development, with the Extension Service.

The course description is as follows: "An introductory course designed to acquaint students with the Cooperative Extension Service; its place among other educational agencies; its purpose, philosophy and objectives; how it operates and the results obtained; its social and economic significance; and the use of research data in the development and conduct of the Extension Program."

FIRST ALL COLLEGE OPEN HOUSE

Clemson will hold its first open house in which the entire college will participate on March 29, 1958. All the schools will have a display or demonstration. Final plans have not been completed.

FACULTY SEMINAR

A faculty seminar on agricultural instruction, initiated in 1956-57, is being continued this year. On October 17, Professors J. B. Monroe, B. H. Stribling, and E. E. Waite conducted a panel discussion of “The Learning Process.” “Counseling with Students” was the subject of the seminar on November 21. The guest speaker was Mr. John B. Gentry, Director of Personnel at Clemson. On December 12, Professor R. E. Ware lead a discussion of “The Use of Audio-Visual Aids in Teaching.”

DAIRY CLUB FIRST

The Dairy Club won first place in campus display on Homecoming weekend. Fourteen organizations erected displays in an effort to contribute to the success of the Homecoming festivities. All displays received high praises from the judges, but the final decision was that the Dairy Club display was tops.

GROWTH CONDITIONS CONTROLLED

Plant growth conditions have been successfully isolated and controlled by a Clemson experimental team. A high frequency fluorescent lighting system has been installed that may produce several generations of plants per year and expedite breeding work significantly.

The research, began last fall, is conducted by E. B. Rogers, associate professor of agricultural engineering, and Carl J. Turner, assistant agricultural engineer, South Carolina Experiment Station.
GARDEN CLUB PRESENTED PLANTS
Clemson College has presented approximately 5,000 crepe myrtle plants to the Garden Club of South Carolina for beautification purposes.

Dr. M. D. Farrar, Dean of Agriculture, states that the plants were distributed in the state to respective garden clubs as part of a co-operative project between the college and the state garden club organization. Mrs. J. T. Rutledge, Conway, state garden club president, reports that almost 200 communities shared in the distribution.

DAIRY SCHOLARSHIPS
A total of $6,300 will be awarded next fall to students majoring in Dairying. Three new $1,000 scholarships will be awarded in 1958 by the Coburg Dairy, the South Carolina Dairy Association, and the Ladies Auxiliary of South Carolina.

At present, Eskel Miller of Columbia is the holder of the $1,000 South Carolina Dairy Association Scholarship. George W. Powell of Williston was awarded the $1,000 scholarship given by the Coburg Dairy in Charleston. Powell also won a $300 Borden Scholarship. William R. Roberts of Anderson holds the Pauline Hanchel Dairy Scholarship, which is given by the Ladies Auxiliary of the South Carolina Dairy Association.

James Trammell of Woodruff, was this year's recipient of the Ralston Purina $500 Scholarship.

LIVESTOCK JUDGING TEAM COMPETES
The Clemson livestock judging team recently competed in the International Livestock Inter-collegiate Judging Contest in Chicago, placing 26th in the nation.

The members of this year's team are: Hugh Ables, Westminster; Ted Hayes, Jr., Sellers; James B. Petty, Chesnee; Thomas N. Rogers, Fork; James Younce, Trenton; and William C. Weeks, Williston, Florida. Professor D. L. Handlin is the coach.

The livestock judging team is sponsored by the Animal Husbandry Department, the S. C. Livestock Producers, and the Block and Bridle Club.

ECONOMICS FACULTY
Dr. J. M. Stepp attended the Southern Economics Association in Memphis, Tennessee on November 7-9. He participated in a program on southern economic development.

EAT LIKE PIGS?
Can you imagine telling your children it's perfectly all right to eat like pigs after all?

Well, Professor Dale Handlin, who heads Clemson's swine program, says it might be a good idea if everyone ate like them. He thinks most people underrate the lowly pig's intelligence.

"Unlike most animals," he says, "the pig quits eating when he's had enough and goes off to lie in the shade. You often hear people refer to someone's eating like a pig, and generally they mean they're overeating. But it might be a good idea if everyone ate like a pig."

A.S.A.E. MEETS
The first annual meeting of the South Carolina section of the American Society of Agricultural Engineers was held in the Clemson House on November 22. The principal speaker was Jimmy L. Butt, St. Joseph, Michigan, national A.S.A.E. secretary.

IRRIGATION ENDOWMENT
W. B. Camp, born South Carolinian and Clemson graduate, is a firm believer in irrigation for this part of the country and has endowed Clemson for the advancement of irrigation methods here. Mr. Camp is one of the big farmers of the world in California and Vice President of the United States Chamber of Commerce.
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at the Red and Yellow Sign of . . .

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FEEDS
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Research Farm at WHITESTONE
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SPARTANBURG and NEWBERRY
James Aubrey Murphy, a recent graduate of Clemson College, is a prominent instructor in the Agricultural Engineering Department at Clemson. Mr. Murphy is a native of Anderson, South Carolina. He attended Clemson College and received his B.S. degree in June of 1955. He has been teaching five semesters, beginning in September of 1955. At the present time he is teaching Farm Machinery (Ag. En. 201) and Farm Equipment, a 202 course for Agricultural Engineers. While teaching, these two courses, he is working on his M.S. degree, which he plans to receive next summer.

During the past two summers he has worked with the Horticulture Department in research on Aromatic tobacco. His work included making reports on his findings in this research.

While in college at Clemson, he was active in school organizations. He was an active member of Phi Eta Sigma, the freshman honorary fraternity for the entire college. In the School of Agriculture he was a member of Alpha Zeta. In his junior and senior year he was a member of Phi Kappa Phi, the honorary fraternity for the entire college. Mr. Murphy was active in the American Society of Agricultural Engineers, and he is Faculty Advisor for this organization at the present time.

Mr. Murphy lives in Anderson. He is married and has one child.

Professor Dale Handlin is a prominent figure in the Animal Husbandry Department here at Clemson. Professor Handlin was born in Geneses, Kansas, and received his B.S. degree in Animal Husbandry from Kansas State College in 1951. While at Kansas, he was a member of two winning livestock judging teams at the National Livestock Exposition in Chicago. In 1950 he was high scoring individual at the National Livestock Exposition.

Professor Handlin did graduate work at Texas A and M College where he received his M.S. degree in Animal Breeding in 1954. During these three years he coached the livestock judging team at Texas A and M College.

In 1954 he joined the Animal Husbandry Staff at Clemson College. Besides teaching, he is coaching the judging team and is in charge of swine. In 1954 his team was high in swine at the National Livestock Exposition and placed 15th in the contest. In 1957 the Clemson team won first place in the Spring Southeastern Livestock Judging Contest.

Professor Handlin is well known for his publication, Livestock Judging Manual, which is in great demand.

Professor Handlin is a member of the American Society of Animal Production, a member of the Clemson Jaycees, a member of the Fort Hill Presbyterian Church, and Faculty Advisor for the Block and Bridle Club.

Professor Marlin H. Bruner is on the teaching staff in the Forestry Department for the first time this semester. Professor Bruner received his B.S. degree from Penn. State and his M.S. degree from the Yale School of Forestry.

Professor Bruner has had wide experience in his profession. He worked with the State of New Jersey Forestry Service. He did Extension Forestry work at the University of Arkansas in the years 1936-39 and was employed with Dupont in Public Relations for a number of years. In January of 1939, he came to Clemson to carry on the Extension Forestry work in the state of South Carolina. He was away from Clemson for a number of years on another job, but
FOR HUNTERS ONLY
Have you seen the new duck stamp? It is a black and white wash drawing of several Canada geese feeding in a picked cornfield. This drawing by Leslie C. Kouba of Minneapolis was chosen for the 1958-59 season. A new duck stamp is issued each year by the Post Office Department, which is in charge of its distribution and sale. Every person over the age of 16 who hunts migratory waterfowl is required to have this stamp on his person while hunting.

More than two million duck stamps are sold annually. The revenue from the two dollar stamps is used to supplement other funds appropriated to the Fish and Wildlife Service for the purchase, development, administration, and maintenance of waterfowl refuges throughout the country.

* * * * *
Bobwhite quail hunters in the South may flush strange birds in front of their dogs this year. If a small bird resembling a cross between a meadow lark and a bobwhite quail bursts out of cover, it may be the Japanese Coturnix quail. Thousands of these birds have been imported from Asia and released in southern and midwestern states this year. Coturnix released in Tennessee last year were shot by hunters as far south as Florida. So keep your eyes open this season for the new "face" in the fields.

—G. S. Adams

BRUNER
(Continued from page 11) he returned in January of 1954 at which time he began his new work in the management of the Clemson College land. Since the new course in Forestry has just started, he is teaching this semester to balance out the teaching load in the Forestry Department. At the present time he is teaching Farm Forestry (For. 205). His major interest at the present time is to find ways to bring about natural reproduction of Short Leaf Pine and Yellow Poplar.

As part of his service at Clemson, he has written several articles for leading farm and professional forestry magazines. He has written articles for the Forest Farm and Journal of Forestry. He is a member of several civic and professional organizations, including the Society of American Foresters Association, Forest Farmer, Friends of the Land, and the Fellowship Club of Clemson.

THE AGRARIAN
The development of numerous brown freckle spots on peaches is the result of earlier infection by the fungus Cladosporium carpophilum. This fungus, causing the peach disease called scab, attacks peaches everywhere they are grown except in arid regions. It is favored by moist weather and moderate temperature during the growing season. It is more likely to be serious in low orchards having moist situations than in those having good air drainage. It affects the fruit, twigs, and occasionally the leaves, but is of economic importance only on the fruit.

Scab first appears on the fruit as pale green circular spots about one-sixteenth to one-eighth inch across, generally most numerous at the stem ends, but frequently scattered over the peach. They slowly enlarge and the color changes from green to dark brown then to almost black. These spots first become visible sixty days after the blossom petals have dropped. The fruit is about one-half grown at this time.

Scattered infections mar the appearance of the fruit but otherwise do little damage. Numerous infections, however, frequently coalesce, forming a dark crust-like growth that interferes with the normal swelling of the peach, causing it to crack as it ripens. Badly infected fruit is small and is readily identified by the brown rot fungus.

During the portion of the season before the fruit is harvested, the new twig growth remains smooth, but since spraying operations stop with the harvesting of the fruit, the new shoots are left unprotected during the rest of the season. By the time the leaves drop in the fall, the scab fungus develops on the undersurface of the leaves, forming irregular patches of brown growth. This phase of the disease is of no commercial importance.

The scab fungus grows very slowly and infections take at least forty days before the spots become visible. Numerous experiments and many years of practical experience have been utilized in the control of scab. Bordeaux mixture was first used as a spray to control peach scab but caused too much injury to the tree and the fruit. In 1907 a self-boiled lime sulfur mixture was used safely and was practical. One spraying of wettable sulfur, six to eight pounds per one-hundred gallons of water, will give almost perfect control of the disease on the fruit. However, due to environmental conditions fluctuating from season to season, it is conceivable that in some years conditions might be so favorable for scab development that as much as twelve pounds of sulfur per one-hundred gallons of water is necessary to give satisfactory peach scab control. Sprays should be applied with at least an average pressure of 200 pounds per square inch and one-half to four gallons of spray should be applied to each tree, of course, depending on their size.

A demonstration in 1917 proved that forty to sixty days lapse from the time spores infect the peach until the spots become visible. The timing of fungicide applications is of major importance, and sprays must be applied during the period of thirty to sixty days after petal fall or the fruit will become infected and develop spots. By following the South Carolina peach spray schedule this would mean a spray application at thirty, forty-five, and sixty days after petal fall. On varieties maturing later than Elberta a fourth application should be made seventy-two days after petal fall.

**Peach Scab**

By F. B. Ashley, Hort. '58

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**SOUTHERN BLUEBERRIES FOR HOME GARDENS**

The southern highbush blueberry, commonly called "rabbiteye" blueberry, is highly recommended for the home garden. It is vigorous, drought and heat resistant, very productive and has a short rest-period which enables it to grow well anywhere in the state. Fifteen year old plants at Clemson are four to five times larger than northern highbush which are more exacting in cultural requirements.

This plant does well on an acid sandy or sandy loam soil of pH 4.5-5.5, rich in humus and of good fertility, well drained but retentive of moisture. Moisture appears to be the most limiting factor for success. The plant cannot stand waterlogged soils nor will it grow well in dry sandy soils of low humus content. The soils where it grows naturally are mostly of the Norfolk or related series, with much fine sand and a clay subsoil at one to four feet.

Better growth and yield will be obtained on relatively dry sites by mulching to a depth of 6-8 inches with straw, pine needles, or old sawdust. On the heavier upland soils of the Piedmont, the plants appear to withstand less acid conditions and grow much better when mulched. A frost-pocket site should be avoided when possible.

On good sites a 10 x 10 foot spacing is best, especially with a high water table. An 8 x 8 foot spacing will do on drier soils, such as highland sites in the Piedmont. To maintain the desired acidity, a complete fertilizer of acid reaction should be used. An ounce per plant should be applied the year after setting out, and the amount increased gradually until the plants get about one-half of a pound annually. When nitrogen seems necessary, apply ammonium sulphate rather than sodium nitrate. The blueberry is shallow rooted and cannot stand deep cultivation.

The southern highbush blueberry can mature tremendous crops without pruning. Small bushy wood and dead or diseased branches should be cut out. As the plant gets older, new stems can be obtained by pruning back large old stems to a new shoot or shoots near the base of the old stem. Tall, erect-growing varieties may need cutting back to facilitate harvesting. Pruning to reduce the number of fruit buds usually results in the production of larger fruit.

Until 1950, all available varieties were selections from the wild. Since then several varieties have been developed by controlled breeding. At least two varieties should be planted to insure pollination and greater production.

—H. J. Sefick

JANUARY 1958

THIRTEEN
CLEMSON MILK
(Continued from page 3)

After the hot milk is homogenized it passes through the heat exchanger for pre-cooling with the cold raw milk and final cooling with ice water. Stainless steel plates keep the two liquids separated during this heat transfer. Upon the completion of pasteurization, homogenization, and cooling, the cold pasteurized milk is piped to sanitized ten gallon milk cans. These cans of milk are then delivered to the dining hall. The milk is poured into pitchers which the student waiters place on the tables. The next time you drink that glass of milk and call to the waiter for seconds, remember that this good milk does not just happen to be there.

GINNING
(Continued from page 7)

The opportunities for a person completing this program are very broad. At the present time there is a great shortage of qualified engineers in the cotton industry and there is no doubt that this shortage will continue to exist for some time. It is felt that this program will help to alleviate this shortage and that a person completing this program will be in a position to make a real contribution to the cotton industry.

ABOUT THE COVER

In the last decade a strong movement toward the restoration and the firing of muzzle loading rifles, shotguns, and pistols has taken place. Thousands of Americans hunt with these ancient weapons annually, and national matches are held annually at such places as Renfro Valley, Kentucky, and Waynesville, North Carolina. One of the most prominent of these is the North-South match, which pits the Rebel representatives against the Yankees. During this match many days are devoted to pistol and rifle matches, and even cannons get into the competition.

Black Powder and percussion caps have returned to the market again, and antique firearms firms have been flooded with orders for rifles in working condition. The demand has exceeded the supply to such an extent that many gunsmiths make new muzzle loaders on special orders.

Hunting with these old “bacon gitters” is a real challenge. Because of their low velocity, the shots have to be well placed in the most vulnerable spots. Nevertheless, these old pieces are much more accurate than one would imagine, but the knowledge that he has only one shot makes the hunter more careful.

There are several muzzle loading enthusiasts on the campus. Probably the most enthusiastic is Professor Robert Ware of the Zoology Department, who attends matches all over the south.

The next time you see a hunter with a long rifle, don’t look at him as if he were crazy. He’s just bringing back and almost forgotten art while he spends many pleasurable hours enjoying this increasingly popular sport. —G. S. Adams

WITCHWEED
(Continued from page 6)

However, about two-fifths of the infested area is found in peat-mucks.

Control

It is very important that all farmers be watchful for this plant parasite. Early detection is the most important step in control. If witchweed is suspected, the farmer should call his county agent or other agricultural agencies concerned to check his field. It is very necessary that the agent come to the plant; the plants should not be taken to him because unintentionally, seed will be spread in the course of plant identification.

To help control the weed, the Crops Research Division of the Agricultural Research Service published a pamphlet (PA-331, USDA). This publication suggests the following control measures:

1. Notify your county agricultural agent if you find witchweed or suspect that a plant may be witchweed.
2. Do not move plants suspected of being witchweed. Request an on-the-farm identification from your county agent.
3. Do not plant corn, sugarcane, or sorghum on infested lands.
4. Adopt these crop rotation practices.
   a. Plant wheat, oats, barley, or rye in the fall; follow then the practices recommended for your locality.
   b. Follow these small grains the next year with either catch, or trap crops.

Use a true witchweed host such as Sudan grass as a catch crop. It secretes the chemical that causes the witchweed seeds to germinate and will support the parasite’s growth. Planting and plowing under the host crop before the witchweed produces seed will reduce the weed seeds in infested fields.

Continue this practice as long as is necessary to deplete the soil of witchweed seeds.

Use for trap crops plants that will cause witchweed seeds to germinate but are not true hosts. Cowpeas or soybeans, for example, will cause witchweed seeds to germinate, but they will not support the parasite’s growth.

Trap crops should not be harvested on farms where witchweed is a severe problem unless the harvested crop is to be used in the infested area.

5. Kill crabgrass because it is a host of witchweed, as are some other grasses.

6. Treat non-cultivated lands infested with witchweeds and infestations found in cornfields with an herbicide, such as 2,4-D, to prevent flowering and seed production.

If crops susceptible to 2,4-D are nearby, the witchweed can be killed by spraying it with an herbicide such as DNBP in diesel oil.

7. Treat cultivated land where witchweed is noted for the first time, by either cultural or chemical means to destroy the pest.

8. Keep cotton, tobacco, peanuts, and sweet potatoes free of witchweed host plants such as crabgrass. These crop plants can be grown on witchweed infested lands so far as known now.

Only through the cooperation of the farmers, research workers, and all persons concerned, can this dread parasite be eradicated from American agriculture.
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For nearly sixty years, New Idea spreaders have been first choice of experienced farmers because they last longer, do the best job.

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One way New Idea adds years of spreading. At left, water stands on surface of water repellent Penta treated board. At right, untreated board absorbs moisture. This New Idea treatment assures longer, rot-free life.
TALL CORN

A group of prohibitionists looking for evidence of the advantages of total abstinence were told of an old man of 102 who had never touched a drop of liquor. They rushed to his home to get a statement. After propping him up in bed and guiding his feeble hand along the dotted line, they heard a violent disturbance from the next room—furniture being broken, dishes being smashed, and the shuffling of feet. “Good heavens, what’s that?” asked the visitors. “Oh,” whispered the old man as he sank exhaustedly into his pillow. ‘That’s Pa drunk again.”

He only drinks to calm himself His steadiness to improve Last night he got so steady He couldn’t even move.

Hall Counselor: ‘Why didn’t you scrape the mud off your shoes when you came in?’
Animal Husbandry Student: ‘What shoes?’

Favorite joke around the Civil Defense Department about the three sizes of hydrogen bombs: big, bigger, and “where is everybody?”

His companion bent over the dying man, to catch the last faintly whispered words. The utterance came with pitiful feebleness, yet with sufficient clearness: “I am dying—yes. Go to Fannie—Tell her—I died—with her name—on my lips—that I loved her—her alone—always . . . and Jennie—tell Jennie—the same thing.”

Mary was complaining to Jim across the dinner table. “What a day,” she said. “Baby got his first tooth, took his first step, fell, and knocked out his first tooth and then said his first word.”

Then there was the time they crossed a rooster with a rooster, and you know what they got? A very cross rooster.

An ashtray is the place where you put your butts when the room you’re in doesn’t have a floor.”

Father to small boy dragging top half of Bikini suit along beach: “Now show Daddy exactly where you found it . . .”

Mr. Finsnipper took his secretary, Miss DeMeanor, on a business trip involving an overnight train ride. She was in the upper berth he in the lower. He was almost asleep when she called down: “Mr. Finsnipper, do you have something to read? I’m having a hard time getting to sleep.” He passed a magazine up to her.

Ten minutes later: “I’m sorry to disturb you, Mr. Finsnipper, but would you mind getting me a drink of water?”

“Miss DeMeanor,” he replied softly suggestive, “would you like, just for this one night, to pretend you were Mrs. Finsnipper?”

“Yes, very much, Mr. Finsnipper.”

“Fine,” he bellowed. “Now get up and get your own damned drink of water.”

A United Press dispatch from Milwaukee revealed this:

George Hauff, 69, boarded a streetcar on Tuesday morning without his pants.
Police who arrested him asked why he was riding around “on a streetcar on Tuesday morning without any pants on?”

“TUESDAY?” Hauff marveled. I thought it was Monday.”

Pilot to tower, pilot to tower: plane out of gas; am one thousand feet and thirty miles over the ocean, what shall I do?”

Tower to pilot, pilot to tower: repeat after me . . . Our Father Who Art in Heaven . . .

Nightcap: Something that went on Grandma’s head instead of to it.

Lawyer: Why did you shoot your husband with a bow and arrow?
Defendant: I didn’t want to wake the children.

SIXTEEN

THE AGRARIAN
And new 70-bushel McCormick No. 21 spreads this big load in a hurry, too! It rips hard-packed manure to pieces and spreads it uniformly. Treated wood box with steel flares and rugged frame for long life.

Quick drive-in mounting...

**BIG LIFT at LOW COST**

with the New McCormick No. 33 Loader!

Ram-in loading—even with a 50 hp tractor—doesn't strain this new low-cost McCormick No. 33 loader. And all-welded frame, sturdy bracing, and closer-coupled, single-unit design also give the No. 33 loader strength to lift a ton nearly 10 feet high. Split-second control, 3,000-lb breakaway lift, and big 9-cubic-foot fork help you load 70 bushels in only 9 or 10 passes to cut manure moving time.

And you just drive in to mount the No. 33 loader in about 12 minutes. Parking legs, which hold the loader at proper height for fast mounting, become front braces. The rugged No. 33 loader mounts on International® 350 and 330 Utility tractors: Farmall 450, 350 and earlier models.

Save trips with new McCormick 95-bushel spreader. 108 self-cleaning beater teeth help new McCormick No. 30 spreader shred manure more thoroughly. Your choice of ground or pta drive.
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Wherever you meet people, you meet Winston! This rich blend of bright, clear tobacco gives you mellow flavor you can enjoy. And you'll enjoy America's favorite filter, too! The pure, snow-white filter in the smart, cork-smooth tip is exclusive with Winston. Now is the time for you to switch to America's favorite filter cigarette—Winston!

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