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COVER—A farmer in Anderson county looks over his fields of grain.

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THOMAS T. TRAYWICK COPE, S. C.
Dear Sammy:

Plans for your high school graduation sound fine. They certainly make me realize that my "little brother" is about grown. And I'm mighty glad that you'll be entering Clemson next fall.

I know just what you mean about not knowing what course to sign up for here. It worried me the same way, and I had to find out the hard way. Remember what a big shot I thought I was leaving the farm to become a Clemson "rat"? I was going to become an engineer or chemist or something, and never have to look at a farm again. No more milking cows on cold winter mornings or breaking my back making hay! Look at me now -- a senior in Agriculture at Clemson, and happy as a lark.

I don't suppose I should write the rest of this letter, for I can hear you say now, "There goes that brother telling me what to do again. I wonder what he thinks I am, a dumbell?" No, Sammy, I don't. That is why I want you to think seriously before deciding what to study here.

Don't be fooled into thinking that everything that glitters is gold. I was going to be an engineer. Why? Mainly because it sounded good. It was the thing to do. So many freshmen get into something they know very little about, figuring that they will make a lot of money in a few years. My freshman year was a big disappointment. The "D's" and "F's" on my report card showed that I didn't have the aptitude in mathematics and some other things to make a successful engineer. Of course, some fellows who were looking for greener pastures did all right. For all I know, you might. But it's a big chance to take.

It now seems so strange to me that anyone who was raised on a farm could overlook the opportunities which are his. I don't suppose any occupation offers greater pleasures and satisfactions than agriculture. You and I are farm boys. We like hunting, fishing, or just generally taking a day off now and then if we want to. We like to watch and help things grow. We like nature and have lived with it.

With my training, I'm going to return to the farm. I know I'll make good and be very happy as well. However, the Clemson graduate in Agriculture will find many openings with state and federal agencies, industries related to agriculture, and others. Engineering and textiles offer very good job openings too, but why throw away your valuable farm background?

Well, I've said enough. Just don't wait until you get up here to decide what to take. You'll be confused enough at best. So give it serious thought now.

Give my love to "Mom". Write when you have a chance.

Your brother,

DICK.
HERE'S HOW YOU CAN

MAKE HOME TANNING A HOBBY

Naturalists Can Tan Skins and Make Leather With Simple Equipment and These Directions

TANNING IS sometimes referred to as an art, and those who have just attempted their first tanning job without proper instructions or knowledge of procedure will surely agree to that name.

Actually it is not an art, though some phases of the work do require a certain amount of skill. Almost anyone, however, who has the time, patience, desire to learn and a few suitable skins to practice on can generally achieve quite satisfying results after a few attempts.

Tanning is a process for loosening up the fibers of a skin, making it soft and pliable, and so treating it that it will remain in that condition. There are a number of ways to accomplish this and all methods seem to have their good and bad points depending upon what the finished skin is to be used for.

I shall describe here a few of the more simple methods for tanning furs and making leather. All of these methods are good and if directions are followed closely little difficulty should be experienced in turning out nice work.

To begin with select a skin that is prime, in other words one that was taken in cold weather and that is light colored on the pelt or flesh side. Summer skins are usually a dark bluish color on the inside and the roots of the hair may be seen protruding through the skin when all flesh and fat has been removed. Such a skin is unfit for tanning or any other purpose. I would also advise starting on a skin that is not too large or heavy. The common house cat has an excellent skin to experiment with.

The first and one of the most important steps in tanning any pelt is to prepare the skin for tanning. Failure to do this properly will result in disappointment regardless of how carefully you follow all the other steps in tanning. Nearly all skins have a very thin, tough membrane resembling strong tissue paper attached to the flesh side. This membrane must be completely removed along with all flesh and fat that may remain attached to the pelt after skinning.

If you wish to tan an old skin which has been dried out it will first have to be soaked up in plain water or water to which a little salt has been added before it can be properly fleshed. Leave it in the water until it is thoroughly relaxed but no longer than is necessary else the hair might start slipping. After it is relaxed salt it down and treat it just the same as a fresh skin.

When fleshing a skin always scrape from the tail end towards the head, otherwise there is a great deal more danger of cutting or tearing through the hide. If a skin is in good condition it is often possible to peel the membrane off with the fingers after getting it started with a scraper. If this can be done it will save a lot of time and will usually result in a neat job.

After the skin is thoroughly fleshed wash it in plain water to remove the remaining salt and dirt. If the skin is slightly greasy use soapy water to cut the grease and then rinse thoroughly in plain water. Or if the skin is very greasy it is well to wash it first in gasoline, using several changes of gasoline if necessary, then wash it in soapy water to remove the gasoline, finally rinsing in plain water to remove the soap.

Now you are ready to proceed with the actual tanning. Below are three methods suitable for small or medium size skins up to the size of a deer. The first method is a salt-alum process and is especially recommended for skins with a fine, soft fur. It may be used with equally good results on any small skin however.

Dissolve one pound of alum in one gallon of water. In another contain-

(Continued on page 27)
GUEST EDITORIAL

A Challenge -- Stay South

New Openings Pointed Out By A Leading South Carolina Citizen

By THE HONORABLE R. M. COOPER
Board of Trustees, Clemson College

The need to blend industry and agriculture into a prosperous economy is an old story to the South and, at times, the goal has seemed far too distant.

Today, there is real progress to report. New industries—579 of them in South Carolina alone—are coming into the South. The established industries are expanding, those

processing plants, dairies, more cash crops and, with them, a more stable financial status for the farmer are being built up.

The movement is so broad that few of us are able to study and analyze every phase. One, in particular, is most gratifying.

That is the leadership, especially among bankers, in helping to develop the South. As a group, the bankers have helped for years, but today there is an all-out effort evident. They are doing everything possible to extend credit to veterans, to young men and to all farmers.

Their new methods of measuring loans in productivity of the land what can be done to increase it are in keeping with the new attitude of the South.

It is just as important in results as the preparation of farm lands for mechanization, the finding of new means of processing cotton, the progress of scientists in discovering the way to fashion fabric from peanut hulls . . . perhaps, more important. For the farmer has been encouraged for years to save and improve the soil.

Today, there is more incentive—a long-range plan to make his fields more productive and, in turn, to lend impetus to the progress and development of agricultural industry and the prosperity which is certain to grow with it.

There is no question in my mind that the balance between industry and agriculture can be achieved with the material and equipment at hand. It is, however, a matter of hard work.

That is up to you—a challenge that young southerners should be proud to accept.

MAY 1947
OPPORTUNITIES IN LIVESTOCK

Animal Husbandry Department Expands with Changing Agriculture; Adds New Barns, More Pastures, Improved Sires, Research Work

By D. M. Camp
Animal Husbandry, 1947

Springs is certainly here in South Carolina. The countryside is greener than ever before due to increased acreages in pasture land. Numbers of livestock are increasing, meat prices are high, the demand is heavy, and interest is being shown all over the state in pure bred animals. The enrollment at Clemson College has increased greatly and the percentage of students majoring in Animal Husbandry has also increased. With all of these facts in mind, a clear picture of the work being done by the Animal Husbandry Department will be presented in this article.

With the changing system of farming in the South, Clemson is changing also. To meet the requirements of the students and the state, the entire system of buildings, pastures, herds, and flocks are being revamped.

The number and value of livestock in South Carolina has increased tremendously since 1930. The cash receipts from livestock and livestock products was $16,440,000 in 1930. In the years following this figure has grown and reached a height of $39,382,000 in 1945. The number of cattle on South Carolina farms has increased from 350,000 in the 1935-44 period to 400,000 during 1945. Hogs showed a similar increase from 615,000 to 704,000 during the same period. The value of livestock per head has made an increase from $32.60 for cattle during the 1935-44 period to $59.90 in 1945. In the case of hogs this increase has been from $8.94 to $19.10 for the same period. It is easily seen that it is vital that Clemson College carry on its work of educating students in the field of Animal Husbandry to an even larger degree.

The Clemson Animal Husbandry Department has been assigned 2000 acres of college property to develop into pasture and hay land. A large part of this land has been woods, steep hillsides subject to erosion, and generally land of sub-marginal types. So far the seeded pastures have aided in controlling gullies and other types of erosion. These pastures when properly fertilized, yielded a large amount of palatable and nutritious feed for all various types of livestock.

Some clearing of woodland has been done in order to increase the acreage suitable for grazing purposes. On average pasture at Clemson, it has been found that two acres of permanent type pasture for spring, summer, and fall grazing and two acres of temporary pasture for winter grazing will adequately support one animal unit per year with some additional feed being afforded during winter months. The permanent pasture usually consists of a mixture of Bermuda grass, annual Lespedeza, Dallis grass, and White Clover. Temporary pastures that afford winter grazing for a period of three or four months are usually seeded with one of several mixtures. Two of these are: small grains (oats, barley, rye) and Crimson Clover, or Crimson Clover and Italian Rye Grass. Both of these mixtures have proven very satisfactory.

A large amount of the land being developed was formerly part of an old plantation and was in badly run down conditions due to poor cropping systems. It is now the job of the department to build this land up to a degree of fertility that will support a reasonable number of animal units economically. With new and correct fertilizing practices and pasture management, this is being done.

In the past the problems of barn and other facilities for the various herds and flocks has been a serious problem. At this time, however, a new hog barn is being completed with facilities for sows with litters, and for carrying out feeding tests and other experiments. There are sixteen individual pens for sows with litters and fifty experimental pens. A new beef barn is now in the blue print stage. Plans call for all the modern conveniences and equipment for fitting show animals. The plans also call for individual pens, wash ramps, stocks, and a combined show ring and judging arena.

An appropriation has been set aside for a sheep barn. If plans materialize, it will be the first time in the department’s history that a barn was started with the idea in mind of housing sheep exclusively.

The herds and flocks now at Clemson are being improved by the use (Continued on page twenty-seven)
Attitudes About Agriculture
Causes of Misunderstanding Between "Ag" Students and Other Students Pointed Out

Students of agriculture are often still regarded as a sort of poor country cousin by the students in other schools of this college. In spite of the obvious benefits to everyone of our scientific system of agriculture, it remains customary for certain persons in other fields to refer to agriculture as an easy course. While the farmers are amused by some of the so-called humor directed toward them, other expressions arising from ignorance or tradition are disgustingly below the level expected of college students.

Blame for personifying the agricultural student as some sort of quaint rural character does not necessarily rest with individuals now at Clemson. Indeed, the attitude is prevalent within other colleges and universities over the country. It is time to recognize that those pursuing undergraduate study in the agricultural sciences are at least on equal footing with students in other technical fields.

South Carolina is predominately an agricultural state, as are other states of the Southeast. Prosperity in agriculture is then necessary for industrial and social progress. The application of scientific knowledge to agriculture offers the greatest hope of a better way of life for all Southern people, urban and rural alike.

To prepare themselves for responsible positions in the new system of agriculture, students must obtain a basic knowledge of mathematics, chemistry, physics, and especially of the biological sciences. None of these basic studies can be slighted, since all are present in the infinitely complex mechanisms of living plants and animals.

Besides having a general scientific background, the successful agriculturist is a practical man, who can apply his knowledge to producing greater yields, improving the quality of his product, controlling diseases, and establishing marketing systems. Since he must be practical as well as trained in science, the student of agriculture spends many hours in various laboratory exercises, ranging from actual farm operations to demonstrations of biological phenomena of which but a few years ago little or nothing was known.

The wise student of a true science thinks little in terms of comparing his chosen field with others. It is futile to discuss whether a mechanical or a biological science is the more difficult to understand. Each is based upon a great body of facts; so great that a single trained man can keep up with developments in only a limited field of specialization.

Much of the misunderstanding between schools is due to students who have unfortunately attempted the wrong courses because their individual desires and aptitudes are not discovered until after they have completed part of their college course. The fact that a student decides to transfer from engineering to agriculture is no reflection upon his mental powers; it is simply that his personality makes him better suited for work in agriculture. The reverse situation, in which a student is not suited to agriculture, may be equally true.

Tolerance and understanding toward all fellow students should be developed, especially at Clemson where all students have the common bond of studying some part of the vast body of true science.
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ARTIFICIAL INSEMINATION PROGRAM

Improvement of Dairy Herds in South Carolina Resulting From Clemson Research and Work with County Associations

By H. M. HANCKEL
Dairy, 1948

Realizing the advantages that artificial insemination would provide in improving dairy cattle in South Carolina, Professor LaMaster has carried on an active campaign to initiate a state wide program. To carry on this program in an adequate way, a large outlay of buildings and equipment is necessary. Some progress has been made recently for obtaining these facilities. A dairy laboratory and three bull barns were completed at Clemson in May, 1946. The laboratory is fully equipped for collecting, processing, storing, and shipping of semen; also it has facilities for conducting a research program on the various properties of semen to determine the best grades to be used for the artificial insemination program. The bull barns are designed for conducting research work on feeding and management of the bulls to obtain the best results.

An extensive research program designed to improve the quality and increase the quantity of semen thru good nutrition and management of bulls used for artificial insemination was started in December, 1946, under the supervision of Dr. S. P. Marshall. Bulls of the Jersey, Guernsey, and Holstein breeds are being used to compare the value of different diets and to study benefits of including high quality protein supplements, soil crops, a root crop, and a complex mineral mixture in the bull ration. Each month the bulls are weighed and their physical condition checked. The volume and quality of semen produced by these bulls are checked in the laboratory and a record of conception rate from its use in the Clemson Dairy herd is kept.

Dr. Harold Kinard reported at Clemson on February 14, 1947, to do research work on this program of artificial insemination. A South Carolinian from Colleton county, he attended Clemson for three years then went to Kansas State College where he got a doctor's degree in Veterinary Science.

Mr. Y. G. Lewis, a graduate of Clemson in Animal Husbandry in 1943, is the technician for handling this program in the Clemson Dairy herd and assists Dr. Kinard in operating the laboratory.

The first artificial insemination association was started May 9, 1945, in Spartanburg county in cooperation with the Spartanburg Cooperative (Continued on page twenty-nine)
Agriculture Moves Ahead

Clemson’s President Points To Bright New Day in South Carolina Agriculture

FOR A LONG TIME the South Carolina farmer lived the hard way. What he achieved was with brawny muscle and by the sweat of the brow. He followed from one year to the next the conventional practices of his time. He lived by faith and at the mercy of price fluctuations but he did no more than take these as natural functions. Of all mankind he deserved opportunities which would provide better living standards.

About 1890 land-grant colleges like Clemson, established in every state of the union, began to educate farmers in the sciences of plant and animal production. This inspired thinking and planning in such magnitude that the great agricultural research and farmer-teaching agencies developed in a phenomenal manner the like of which no other country has achieved. Fact finding, problem solving, result demonstrations, and an understanding of soils, fertilizers, adaptable methods of culture, varieties of plants, control of diseases and insects, advantageous marketing, and other values too numerous to mention were so well perfected that they gave the American farmer the knowledge that has made him the smartest, most enlightened, and most efficient farmer in all the world. His successful record of production during the two world wars stands as a monument to this achievement and loyalty.

American agriculture has become a progressive and highly competitive business making it necessary for the farmer of tomorrow more than the farmer of today to seek greater knowledge and use it for progressive guidance. He dares not do otherwise if he wishes to live well and prosper.

The ability of the farmer to produce abundantly has benefited the industrial and city people far more than they realize. A variety of good quality plant and animal products reach their tables at a cost low enough to afford most American families a desirable diet.

Under a highly productive system the South Carolina farmer runs into many treacherous problems of marketing his products advantageously. Neglect of the home market on the part of the farmer and use of imported food products on the part of the consumer has been detrimental to both farmer and consumer and to the well being of South Carolina.

This ought to be a thought-provoking matter of interest to every South Carolinian. In stress and prosperous period alike it is sound business to market the products of the farm in home markets as far as it is feasible to do so and finish home products for others. Selling raw products is a major reason for South Carolina’s slow income and efforts should ever be toward discarding any system that fails to give maximum returns. How else can the state, now and for years in the future, an agricultural state reach a prosperous stability when its people are fed by the farmers of other states? Our present conditions in this respect do not make sense to me.

The freezer locker system, which a large number of homes will own in a few years, will help the farmer market his home grown products and greatly improve the diet of all of our people.

The mechanization of the farms in South Carolina will not only reduce the drudgery of farming, but will increase efficiency of production and afford more satisfactory earnings for labor and management. These changes will be of great significance.

There are two deficiencies in South Carolina agriculture of which are of extraordinary importance. I believe correcting the first one would help improve the second one. The first one concerns finishing products of farm and forest for ready use by consumers and for sale at opportune marketing periods. For example, large quantities of canned peaches from California are consumed in

(Continued on page 32)
Economists in Agriculture

He Has Contributed Much to Agriculture In the Social Aspects of The Science

By H. G. Barnwell
Agricultural Economics, 1947

Over a period of many years, agriculture has evolved from the stage of a purely hit or miss proposition to its present position as a very highly technical science. Interest has gone beyond the stage of "Is the soil 'sweet' enough?" and is probing such scientific depths as "How can kaolinite be made more like montmorillonite?" Along with the strides in the physical aspects of the science of agriculture have been the strides made in the social aspects of the science. The agricultural economist has made a major contribution to this progress.

One of the greatest endeavors of the agricultural economist is the study of methods of improving our marketing system. "Marketing is the transfer of goods from the producer to the consumer. Every essential activity for the accomplishment of this objective comes within this concept." It was not until the Twentieth Century that the study of marketing received any attention, and in 1913, Congress appropriated funds for a marketing study. We study marketing so that merchants and producers may become more efficient in selling goods. It will also give us a fair understanding of one of the most important units of our economic system, and will help discover the reasons for the high costs of marketing, and might suggest some means of remediing the situation.

Clemson College has been working on marketing projects for a number of years. Much of this work has been done by the Agricultural Economics Department in cooperation with the Horticulture Department, and the results have been very gratifying. Cooperation with other branches of agriculture is essential to the success of the agricultural economist, and cooperation on the part of the other branches of agriculture is also essential if we are to have a workable system of agriculture.

In marketing studies, the workers must visit the scenes of the various operations all the way from the harvesting to the delivery of the product into the hands of the consumer. Experiments with different types of containers and packs all along the line to determine their functional and economic efficiency must be run. The costs of the various means of transportation must be analyzed, and the comparative economic advantage of each means of transportation determined. Frequently, storage of the goods is necessary. In such a case, the methods of storage must be studied. When the goods reach the retailers’ shelves, the style of display most effective for a particular product is sought after, and the grade or type of product that commands the greatest demand on a particular market must be found. The effects of price changes on demand are also studied.

These and other studies must be made in marketing if the producer is to get a fair return for his effort. He must be rewarded, yes, but, more than that, he must be satisfied with his reward; otherwise, producers will be forced to seek other means of obtaining what they consider their just reward. We must keep the producer happy, we must keep the so-called "middle man" happy, and we must not make the consumer mad.

Another branch of the work of the agricultural economist, and one in which there is much room, is farm management. Farm management is that branch of agricultural economics which seeks to coordinate the various enterprises of the farm to the best economic interest of the farmer. This requires a study of each individual enterprise with respect to its requirements in land, labor, fertilizer, and all the other essentials in the case of crops, and land, labor, feed, and processing in the case of livestock and poultry. In this case, as in others, the farm management man does not seek to give technical advice, but he does see to give the best economic advice in line with the latest technical recommendations.

One of the first things to be studied is the labor supply. This must be done to determine just how much labor can be counted on, so that the time of greatest demand for labor by one enterprise will not coincide with the time of greatest labor demand by another enterprise. Past production records, if available, are studied and analyzed to try to discover just what crop did best on a particular field. The farm management man must always keep abreast of the latest market predictions so as to be able to give the best advice as to what type of cash crop the farmer should plant, and he must be able to give advice on the comparative advantages of the different sections in producing crops. Agricultural cost accounting is also used in trying to determine which are necessary and which unnecessary expenses; this requires an up-to-date knowledge of the costs of various items of farm equipment and their relative values.

(Continued on page 29)
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THE AGRARIAN PRESENTS---

William Barre Aull

Teacher -- Advisor -- Scientist -- Dean

William Barre Aull, Vice-Dean of the School of Agriculture and Professor of Bacteriology, is a man to whom all can look as a source of constant inspiration; for Dean Aull’s life is one of loyal service to Clemson and of constantly overcoming physical handicaps.

Dean Aull was born in Newberry on March 24, 1887. His first schooling was received in the Newberry schools and later in the Pendleton Graded School.

Proof of his determination to work and make good can be seen in the fact that he entered Clemson in 1903 from the eighth grade of school. He had to stand an entrance examination which covered everything in order to be allowed to enter Clemson at the age of sixteen. After passing this examination with flying colors, he began his life as a Clemson rat.

Dean Aull says he had quite a time making up his mind regarding what subject in which to study. He first considered mathematics, then later Agriculture and Chemistry, which were then combined into one. However, he finally decided, with the aid of his brother, a member of the first class, to choose Agriculture and Chemistry.

There were about 700 students enrolled in Clemson then; and as he put it, “Things were really rough.” To back this up, he recalled how reveille was held at 5:45 a.m. and taps and lights out at 11:00 p.m. For a country boy these hours were pretty long.

Then there were inspections, only five per day. There were also such things as demerits. Dean Aull says demerits never worried him, but for those who did have demerits, tours were always arranged. Men with demerits who were not officers could walk off one demerit per hour, and officers with demerits were required to sit in chapel, usually on Saturday afternoon.

Dean Aull was graduated from Clemson in 1907 and returned here that fall to do graduate work as Assistant to the Botanist. After some graduate work, he decided to teach; so began as principal of the Pendleton High School. However, still possessing a thirst for further learning, he borrowed money enough to attend the University of Virginia to continue his graduate work (1909-1910.)

After leaving the University of Virginia, he accepted a position with the South Carolina Seed Department at Clemson. Shortly afterwards, however, this department was moved to Columbia; and as the old saying goes, “Once a Clemson man, always a Clemson man,” he elected to give up this position and remain at Clemson as Assistant to the Botanist (1911-1912.)

In 1915, Dean Aull became Assistant Professor of Bacteriology, and in 1917 he was named Associate Professor. He became Professor of Bacteriology in 1941.

Dean Aull further advanced his education when he spent the summers of 1925, 1927, 1928 at Iowa State College. In 1936, he received another “feather in his cap” when he was named to the high position of Vice-Dean of the School of Agriculture.

Since being at Clemson, Dean Aull has been very active, serving on numerous college and community committees. He is Chairman of the College Schedule Committee, Chairman of the Sears Roebuck Scholarship Committee, and Chairman of the Agricultural Curriculum Committee. In addition, he is the Agricultural Representative on the College Curriculum Committee, Secretary to the Agricultural Faculty, and Class Advisor for the junior and senior agricultural students.

As Class Advisor, he has given all students who seek him out invaluable advice. In this position he has guided and encouraged many students to greater achievements and success in their scholastic careers.

Among the fraternities and clubs of which Dean Aull is a member are the society of American Bacteriologists, the South Carolina Academy of Science, and the American Association for Advancement of Science, in which he is a fellow. He is also a member of Phi Kappa Phi, national honor fraternity, and Alpha Zeta.

Dean Aull is another of the Clemson “Old Timers,” who by his kindly manner and considerate deeds has endeared himself to thousands of Clemson students.
CERTIFIED SEEDS and plants, dependable because they were produced and handled under supervision of state inspectors, may soon become generally available to South Carolina farmers.

Action of the General Assembly was based upon realization of the fact that farmers of the state have, in the past, experienced difficulty in producing or otherwise procuring an ample supply of dependable seed and plants adaptable to their soils and climatic conditions. Much inferior production and increased cost can be prevented by seed certification.

Objectives of seed certification make the merit of such a program evident:

(a) Developing reliable sources of high quality seed or plants.
(b) Safeguarding the purity and quality of purebred seed and plants as developed by agricultural experiment stations and recognized plant breeders.
(c) Protecting purchasers of seed by maintaining an inspection service for certifying only seed and plants of high quality and known origin.
(d) Emphasizing the importance and value to farmers of certified seed and plants; and fostering the production, distribution and general use of the same.

Plans of the South Carolina Seed Certification Service contemplate the certification of small grains, cotton, corn, and such other crops as demands may require. Only the varieties of a crop which are approved by the South Carolina Experiment Station or recommended by the Extension Service will be eligible for certification.

Tags of three colors will be used to designate different classes of seed:
(a) Stock seed furnished by breeders shall, if otherwise qualified, bear the official purple certification tag.
(b) The first year progeny from seed tagged with purple certification tags shall, if otherwise qualified, bear official blue certification tags.
(c) The second year progeny from seed tagged with purple certification tags shall, if otherwise qualified, bear official red certification tags. The progeny from seed bearing red certification tags will not be eligible for certification.

If a farmer desires to have a crop or crops certified, he must file an application for inspection with the South Carolina Seed Certification Service, Clemson, S. C. Application blanks may be obtained from the agency or from the local county agent.

Applications for certification of all small grains must have been made by April 20, those for tobacco and hybrid corn by May 1, and those for all fall-harvested crops by July 1. Farmers desiring to have seed certified must submit with their applications for field inspection, copies of the purchase orders or other acceptable evidences as to the SOURCE, QUALITY, and QUANTITY of the seed which they purchased. They must pay the inspection fees prior to the time of the field inspection.

Farmers must rogue their fields prior to inspection in order to remove off-type plants and noxious weeds. Representatives of the South Carolina Seed Certification Service will make field inspections of crops to be certified at times designated by the certifying agency; however, the majority of such field inspections will be made between the date of maturity of the crop and harvest.

An inspection will be made of the seed in the bin after it has been cleaned and made ready for sale. It is absolutely necessary that each lot of seed be kept separate and distinct from all other lots of seed. At the time of the bin inspection, a representative sample of the seed will be taken and sent to the seed laboratory of the State Department of Agriculture for an official laboratory analysis. If the results of the field inspection and the official laboratory seed analysis show that the seed meet certification standards, the farmer will be notified by the South Carolina Seed Certification Service and becomes eligible to receive the official certification tags, which will be furnished at nominal cost. The tags will show the varietal name, percent by weight of purity, percent by weight of inert matter, percentage germination, full name and address of the grower, full names and address of the person or firm selling the seed, name and number of noxious weeds seeds per ounce, results of the field inspection, and any other information necessary to conform to the seed laws of South Carolina.
NOT MUCH change from last year is the prospect for 1947 regarding the supply of complete fertilizers.

The continued shortage of nitrogen materials is the principal factor restricting the fertilizer industry. Through April 1, 1947, the amount of nitrogen material for direct application was very limited, agricultural agencies report.

It seems inevitable that many farmers may have to plant their crops without fertilizer this year. In addition, much mixed fertilizer will be prepared with as low an analysis as is legally permissible.

While all the fertilizer needed this year is not on hand, the situation is scarcely a true shortage. Actually, the use of commercial fertilizers in both South Carolina and the United States as a whole has shown a steady and decided increase during the past several years. For instance, the total United States' consumption increased nearly two and one-half times from the 1930-34 average to the year 1945.

Although the year-by-year rate of fertilizer consumption in South Carolina has not increased as uniformly as the national total, the definite trend toward the use of more commercial fertilizer is indicated by the high of 834,985 tons for the 1944-45 period, compared to 672,753 tons for the 1938-39 period.

Nitrogen materials, being the limiting and critical factor in fertilizer production, bear close consideration—the situation of nitrogen alone; then its effect on the supply of complete fertilizer are important. Of the total 128,000 tons of nitrogen material available in South Carolina through April 1, 1947, the tonnage of soda was 99,000. Therefore, so far this year there has been relatively little nitrate of soda available in this state.

Some Chilean nitrate has started moving, but it is still rather indefinite how much nitrate of soda can be supplied to South Carolina farmers this year. It is hoped that the situation will improve by the time general crops are ready for side dressing.

Nitrogen in solution form, which is used to ammoniate superphosphate, is relatively plentiful. However, this form of nitrogen can be used in mixtures only, since it contains anhydrous ammonia. Then too, many manufacturers are not equipped to use solutions. There is also a limit from a chemical standpoint to the amount of solution which can be used in mixtures. There was hope for more nitrogen from ordnance plants which are now being operated privately. Such plants are located at Sterlington and at Lake Charles in Louisiana. Granular ammonium nitrate is the product which the former ordnance plants plan to produce. Unfortunately, the difficulties involved in putting these plants into production will probably keep them from being of much assistance before the 1948 fertilizer season.

The shortage of nitrogen materials is due to the three factors of strikes in the United States in coal and transportation, labor troubles in Chile, and much nitrogen being sent to foreign countries for rehabilitation purposes.

Complete fertilizers are in abnormally high demand this year. The supply is then insufficient, although it will be approximately the same as the comparatively high figure of last year. This is about 80 percent above the 1935-39 average. Because of the nitrogen situation, a considerable amount of mixed fertilizer will be used as top dressing. In addition, the demand in the middle west will be heavy. There will be a marked tendency by manufacturers to compound low analysis mixed goods so far as is legally permissible. Even this, however, will probably not spread the supply sufficiently to meet the needs of all farmers.

Farmers should be especially careful this year about proper placement of fertilizer; so that they may obtain maximum results from their perhaps limited supplies. A good job of side placement of fertilizers will sometimes double or more the yields over that of applications in the furrow. Some farmers are not as well equipped as others to practice such placement, but in many cases added effort may be justified this year.
GRADUATE SCHOOL IN OPERATION
The Clemson Graduate School was re-established last September with the offering of Graduate work in the Department of Agricultural Economics and Rural Sociology with an enrollment of five students who are working toward a Master of Science Degree. Under the direction of the Board of Trustees and Dr. R. F. Poole, a Graduate Committee was set up with Dr. F. H. H. Calhoun, Dean of School of Chemistry, as Chairman.

In general, the policies governing the Graduate School here will be the same as those governing graduate schools in similar land-grant colleges. All applicants to the Graduate School must be passed on by the Graduate Committee and those accepted must maintain a "B" average their first semester work.

INTERESTING SUMMER SCHOOL COURSE
Something unusual is in store this summer for those who may be interested in Government Policies and Programs Affecting Agriculture. A one hour per day, six days a week course by that name will be offered under the direction of the Department of Agricultural Economics and Rural Sociology and word has come down to "Between The Furrows" that some of the outstanding economists of the country will serve as "guest professors" for short periods during the session. Among those who have already accepted invitations for engagement of about one week are Dr. O. B. Jesness of the University of Minnesota, Dr. W. S. Murray of Iowa State College, and Mr. A. G. Brown of the American Bankers Association.

This course will certainly provide an unusual opportunity for Smith-Hughes Teachers, County Agents, and other agricultural leaders as well as interested students to get the views of some of the nation's best minds on matters of utmost importance to all of use.

SOUTHEASTERN COLLEGE JUDGING MEET
"Between The Furrows" hears that the recent Southeastern Collegiate Livestock Exposition held at Clemson under the sponsorship of the Clemson Animal Husbandry Department was one of the best seen in many years. Prof. E. R. Hauser was director and the Animal Husbandry Club served as assistants. This was the first such exposition since 1942.

Teams from the University of Georgia, University of Florida, University of Tennessee, University of West Virginia, Virginia Polytechnic Institute, and Mississippi State were entered. Clemson being host, did not enter one. The classes were placed in the morning, reasons given in the afternoon and awards made that night.

The winners were announced by Professor Hauser at a Barbecue held at the "Y" Cabin on the Seneca River that night. The University of West Virginia team came first with 3693 points followed by the V.P.I team with 3644 points. Third place went to the University of Florida. First place in individual score went to Beard of the University of West Virginia, second to Williamson of V.P.I. and third to Hill of the University of Florida. Prof. L. V. Starkey made a brief and entertaining talk in which he expressed the delight of the college in being host to the Exposition.

BUILDING PROGRAM FUNDS VOTED
An appropriation of $1,300,000 by the South Carolina General Assembly for building purposes at Clemson is expected to go into a new central heating plant, a chemistry building, and a hospital. Due to high building costs and lack of building materials, it is not known when work will start. However, an enlargement of the College YMCA building to take care of the need of more club rooms, lounging space, and additional moving picture facilities, is expected to begin in the near future.
FURROWS

ALPHA ZETA NEWS

Ten new members were recently initiated into Alpha Zeta, national honorary agricultural fraternity.


H. L. Parr has been Chancellor of Alpha Zeta during the past year.

POULTRY AND BOTANY MAJORS ADDED

In a revision of the Agricultural Curricula in September 1946, majors in Poultry and Botany were established along with a two-year Pre-Forestry course. These new majors bring a total of eight majors offered in the School of Agriculture.

Both of the new majors have a curricula which will offer broad and excellent training in these particular fields. Each department is well staffed and equipped to give students an excellent course. With the large demand for men trained in these fields, it is expected that these two new majors will attract many students.

A study of the Clemson Agricultural Curricula and the curricula of other similar schools reveals that a Clemson graduate can rest assured that he will be among the best trained Agricultural gradates in the United States. Under the new curricula, he receives a broad knowledge of all major fields his freshman and sophomore years and a specialized knowledge his junior and senior years.

SHARP HEADS KAPPA ALPHA SIGMA

D. C. Sharp of Allendale was recently elected President of Kappa Alpha Sigma, Clemson Student Chapter of The American Society of Agronomy.

Others elected were R. C. DuBose of Lamar, Vice-President; D. B. Rosenkrans, Jr., of Clemson, Secretary-Treasurer; and B. N. Kelly of Union, Historian.

BOZARD HEADS AG. ECONOMICS SOCIETY

At a recent meeting of the Agricultural Economics Society, James D. Bozard of Orangeburg was elected President for the coming year. Lamar Judy was elected Vice President and Gilbert Hardee was re-elected Secretary-Treasurer.

MAY 1947
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Starting Again

It was with much pleasure that the present staff began the task of re-establishing The AGRARIAN once more as the official student publication of the School of Agriculture. Although we were lacking in experience, we have tried to make up for this short coming with enthusiasm.

The AGRARIAN'S purpose is to offer to the students, faculty, and other interested persons, a journal through which they might be able to offer articles of interest about Agriculture and the work being done at Clemson College. The publication is one primarily for students, operated uncensored by the students for the benefits of the students and Clemson College.

To the students of the School of Agriculture, the staff asks that you remember that this magazine is yours. Only through your active support and help will it be able to continue. The staff at all times stands open to receive constructive criticism and help from anyone who is sincerely interested in the magazine.

The staff is aware of the fact that had it not been for the cooperation of the faculty and administration plus the patronage of our advertisers, this issue or the issues to follow would not have been possible. To them we offer our sincere appreciation for all of their many efforts.

To the staff which will follow us we ask that you not forget in your policies that every side has two questions and that nothing is gained but defeat in compromise with principles. We leave to you the question of setting up a specific editorial policy for The AGRARIAN. Surely success will follow you as did our predecessors who won high honors and recognition if you will follow that guiding principle, "Seek the truth and the truth shall make you free".

Student Unity

Much has been said recently about the lack of unity among the students of Agriculture on the Clemson campus. It is true, however, that practically all of the departments in the School of Agriculture have departmental clubs or societies organized and working as they should. There is still lacking an organization which unifies the students of agriculture as a group.

The AGRARIAN offers the following proposal with the hope that some interested group of students or some organizations will attempt to put them into reality. The AGRARIAN proposes the establishment of an Inter-Departmental Student Committee or something similar to foster a more unified feeling of spirit and of purpose among the students of agriculture. This might be accomplished by the following plan of action:

1. Monthly chapel meetings of all agricultural students at which time outstanding leaders in the field of agriculture would be presented in interesting and constructively designed programs.

2. Bi-monthly student-faculty social functions which would enable both students and faculty to become better acquainted with each other.

3. Exchange programs between various departmental clubs which would give students a broader view of the work carried on by each department.

The AGRARIAN extends its full backing and support to any group who will work for these things.

Agriculture is a specialized field, yet the fact remains that cooperation between all groups is a must if a successful and prosperous agriculture is to result from the work of the specialist.
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METAMORPHOSIS—A WONDER OF NATURE

Professor Franklin Sherman Writes About What He Considers to Be Greatest Wonder in Animal World

IT HAS ALWAYS seemed to me that metamorphosis is one of the wonders of the Animal Kingdom: How an animal may hatch from an egg an entirely different-appearing creature from what it is when it gets grown, adult.

A common butterfly will lay eggs and those eggs hatch not into young butterflies, but into some sort of caterpillar of an entirely different appearance. This caterpillar will feed on some sort of vegetation and grow larger and larger but still bearing no resemblance to the adult butterfly that laid the eggs. Finally of this pupa is ruptured and out crawls an adult butterfly exactly like the one that laid the eggs in the first place. At first the young butterfly is limp and wet, but by fanning the wings gently they become fully expanded, and the butterfly may fly into the world and live its normal adult life.

I suppose it is all tied in with the way insects have developed during the long course of the earth’s history in ancient times I suppose the changes were more simple and direct, but as time dragged on, it became necessary for them to change from stage to stage until now we have it as we see, the four stages of egg, larva, pupa and adult;—but it has always been a marvel to me. I wonder whether butterflies will always develop like that, or whether Mother Nature will in the course of time introduce some new and as yet unknown twist or turn in the metamorphosis of insects.

There must be some advantage in this complete metamorphosis because about sixty to eighty per cent of all insects develop in this way while only about twenty to forty per cent stick to the simpler form of development of the grasshopper where the egg hatches into a young insect that we can recognize as a young grasshopper. That is more like the higher animals and more like what we might expect. Yet it is only the minority of insects which develop in this way.

Complete metamorphosis seems to have won the day—at least for the present age in world history; perhaps ten million years hence it will be some different story.
HISTORICAL NOTES

EARLY SWEET POTATO HISTORY

The New World’s Major Contribution to Man’s Food Supply Has Spread Over Entire World

By J. C. HERLONG
Horticulture, 1947

THE SWEET POTATO, originally of South and Central America, had developed many varieties at the time of its discovery by Columbus. Historical mention may be found of Batatas being cultivated in Honduras in 1514, at which time there were nine named varieties. One writer in the year 1526 mentioned sweet potatoes in the West Indies and stated that they had often been carried to Spain. He himself had carried sweet potatoes to Avila, in Castile.

The potato is referred to as Apichu of four or five different colors in Peru. Colors mentioned were red, yellow, white and brown. The Camote of Yucatan, called in the islands Axi and Batatas, was mentioned in accounts of the fourth voyage of Columbus. Chanca, physician of the fleet of Columbus, in a letter dated 1494, referred to Agaces as among the products of Hispaniola.

Red, purple, and white sweet potatoes are mentioned as having been cultivated in Spain. Notes refer to their attempted culture in Belgium. These beginnings and attempts to grow sweet potatoes in Europe took place between 1556 and 1576. After 1576, mention of sweet potatoes in the early botanies was frequent. Sweet potato culture in Virginia was noted before 1650. In 1750 there were at least 13 sorts known in the Barbados.

The sweet potato is mentioned as growing in the garden of a writer in England in 1597. The same year it was reported growing in India, Barbary, Spain and other comparatively hot regions. Sweet potato culture was attempted in Italy at that time, but with little success. The root reached St. Thomas, off the African Coast, before 1563. A Portuguese pilot stated that the root, which was called Batata by the Indians of Hispaniola, was named Igname at St. Thomas, where it was one of the most essential articles of food. Spaniards carried the sweet potato to Manila and the Moluccas, and from there the Portuguese distributed it through the Indian Archipelago. It was cultivated in Hindustan and also in Batavia by 1665. The root was one of the native vegetables in common cultivation in all parts of India, the plants producing pink flowers with a purple eye.

Seed was never produced by the plant in China, according to an early reference. This is the first mention of the possible means of propagation used in the early days. Whether it was common practice in tropical countries to collect the seed and reproduce plants by planting is not known. However, most references as to the places the plant was first found were in the tropical countries, where the plant may have set seed.

Thirty-three varieties were mentioned as growing in the Hawaiian Islands in early days. There is also reference to potatoes growing in New Zealand, Tahiti and the Fiji Islands. In New Zealand there is a tradition among the natives that the sweet potato was first brought to the island in canoes made of pieces of wood sewed together.

In Virginia, sweet potatoes were one of the early cultivated crops, growing there in 1648 and perhaps earlier. Jefferson in 1781 mentioned the cultivation of this crop. The sweet potato was introduced generally through New England in 1764, and is said to have come into general use. Early writers stated that sweet potatoes of excellent quality could be grown around Boston, but there have never been planting of much agricultural importance in that region. Plantations of sweet potatoes were observed about Indian villages in the South in the late 1700’s.

It is well to note the distinction between the sweet potato and other plants with edible roots. Many plants grown today have an enlarged and edible root, but are not sweet potatoes.

Yam is the general name given a group of plants found in widely separated parts of the world. Such yams sometimes reach the enormous size of 50 to 80 pounds. Dioscorea Alata, or the white yam, is cultivated in the tropics throughout the world. This yam originated in Southern India, and spread to Africa and America, where the name, “yam” was derived by the Negroes. In the Negro dialect of Guinea, the word “yam” means “to eat”. While the name “yam” is often given to the sweet potato, this is an error according to Sturtetvant, whose writings are regarded as authoritative.

TWENTY-TWO
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Gasoline vs. Kerosene

Gasoline Is Favored As Tractor Fuel With New Tax Refund Law in Operation

A QUESTION frequently asked by farmers since the end of the war is whether a tractor or other power equipment can be operated as cheaply with gasoline as with kerosene or tractor distillate. Many things must be considered before this question can be answered correctly.

The difference between the two fuels is first considered. Both are the products of fractional distillation of crude oil, further processed to remove gum and other impurities harmful to the engine.

Gasoline differs from kerosene or tractor distillate, however, by being further refined. Treatment of gasoline with chemicals which give it a high anti-knock quality is of particular importance. This quality enables the fuel to be more highly compressed without knocking, and is usually referred to as the "Octane Rating." Thus, gasoline has a comparatively high octane rating, while this rating is low for kerosene and distillates.

What actually happens to the fuel inside the engine should be understood. From the tank, fuel is drawn through the carbureter, where it is vaporized and mixed with air in the proper proportion to give a highly combustible mixture. It is then drawn into the cylinder of the engine. Movement of the mixture is due to the decrease in pressure inside the cylinder when the piston goes down on the intake stroke.

Inside the cylinder, the combustible mixture is compressed on the upward or compression stroke until the piston reaches the top of the stroke. Ignition then occurs, burning the mixture, and expansion, due to heat, forces the piston down on the power stroke.

It is on the power stroke that useful power is obtained from the fuel. The compression and power strokes are of particular interest. If maximum power is to be obtained from an engine, the fuel-air mixture should be compressed to the highest possible pressure. This pressure is determined by the compression ratio which is the ratio of the cubical size of the combustion chamber when the piston is at the bottom of its stroke, to the cubical size when the piston is at the top.

Gasoline must be used in a high compression engine. Kerosene and distillates, because of their low octane rating, will break down and ignite prematurely under high compression, with knocking and loss of power as the result.

TAX REFUND

Much prejudice against the use of gasoline has developed because of its higher price. A law is now in effect in South Carolina, however, which refunds to farmers most of the state tax on gasoline used for farm production. The law states in part that five cents of the six cents state tax will be refunded to any person who shall purchase and use gasoline in operating farm tractors and other power machinery used exclusively for farm operations.

Any person desiring to purchase gasoline for farm use should establish a basis for refund of tax by filing with the South Carolina Tax Commission an information blank, which may be obtained from the Commission, containing a detailed description of the machinery in which the tax refund gasoline is to be used. The blank should also show an estimate of the amount of tax refund fuel to be used during the succeeding year.

High maintenance and repair bills are the only solution to many problems in the use of kerosene and distillates. The necessarily low compression engine produces less power for a given size. These fuels necessitate running the engine at a high temperature to completely burn the fuel-air mixture. Complete burning of the mixture when kerosene or distillates is used is not assured; not even by operating the engine at a maximum safe temperature. Unburned parts of the mixture go to three places, at all of which loss in power results.

Part of the unburned fuel mixture passes out the exhaust.

Advantages of the extra power obtained by the use of a high compression engine and gasoline are many. Work can be done in less time, than helping to maintain the sometimes critical farm schedules, and economic savings made. These points will not be overlooked by the wise farmer.
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DEAN COOPER WRITES

AGRICULTURE IS one of the largest industries in the country. When the efforts of other enterprises related to the production and distribution of agricultural commodities are added to the agricultural program, the combined forces represent the efforts of a majority of our people. The utilization of scientific information in the production, processing, and distribution of agricultural commodities creates a heavy demand for scientifically trained leadership in agriculture.

The production of agricultural commodities is largely an individual or family enterprise. The large number of producer units involved and the relatively low production per unit makes it impossible to utilize scientific information and develop technical skills to the same extent as is true in many of the large centralized industrial plants.

Realizing the diversity of enterprises and the significance of a prosperous and permanent agricultural program in any stable social, economic and political system, our national government has attempted to provide research and educational services for the diverse agricultural enterprises somewhat comparable to the services which determine the production efficiency in many of the large centralized industrial organizations.

The national government created the Land-Grant Colleges and Universities in each state to promote education in agricultural and mechanical arts. In order to develop a body of scientific information pertaining to agriculture, the Agricultural Experiment Stations were established in 1887. During the last 60 years the Agricultural Station research program has been enlarged and expanded to cover practically all phases of agriculture.

The Agricultural Extension Service was created to take the results of the research activities to the farmers through the County Agricultural Agents and the Home Demonstration Agents. Vocational Agricultural Education in the public school makes the scientific information pertaining to agriculture available to the public school student. The Soil Conservation Service has been organized to conserve our soil resources, and is employing a large number of men trained in soil science.

The present demand for scientifically trained personnel in the field of college teaching, experiment station research and for service as county agents, vocational agricultural teachers, soil conservation service specialists and in related agricultural activities has created a serious shortage in agricultural scientists. All of the agricultural colleges are enlarging their agricultural, educational and research facilities, but it will require a number of years to train all the agricultural scientists needed in our agricultural programs.

CLEMSON STUDIES OPPORTUNITIES IN LIVESTOCK

(Continued from page six) of proved sires and strict selection. Very recently a Hereford bull, Battle Domino 11th, sire of the reserve champion female of the 1944 National Polled Hereford Show in Atlanta was purchased from the Welsh Brothers in Kansas. There are now 83 Hereford cows and calves in the department herd. The majority of these animals are related to Mossy Ploto 26th.

An Angus herd has recently been started at Clemson with a bull and five heifers purchased at the Brays Island Plantation of Yemassee for a foundation. Two other females have been added which were purchased at the 1947 South Carolina Angus Sale held in Columbia. The Shorthorn herd is small but progress is being made to increase the number of animals and also the quality of the herd.

The sheep flock consists of Hampshires, Dorsets, and Southdowns. Work is being carried on to determine the breed most suited for this state. Clemson has much work on internal parasites of sheep and this has been carried on with much success.

Due to the construction of the G.I. houses at Clemson in and around the area formerly occupied by the hog lots of Goodman Field, the swine herd has been cut down to an all time low. As soon as the hog plant on the Ravenel Place west of the Seneca River is completed, the project will be again enlarged to include Berkshires, Hampshires, Poland Chinas, and Duroc Jerseys.

All of the previous projects, new buildings, and pasture improvement work is being done to give students in agriculture and farmers of South Carolina a wider and more up to date knowledge of livestock production in the state. With the new herds and flocks, the practical application of text book theories may be more easily demonstrated. The pasture improvement work can be seen and the students have a chance to draw their own conclusions from the work.

Among the practical courses offered for the student interested in Animal Husbandry are the courses in Feeds and Feeding, Types and Breeds of Livestock, Pork Production, Beef Production, Horse and Sheep Production, Animal Breeding, Livestock Judging, Farm Meats, and many other courses. Most of the courses offer both theoretical study along with laboratory work so that the student may learn the fundamentals of the various courses and then actually see the projects on the model farm. The courses offered at Clemson are not limited in scope to South Carolina but give information from other state experiment stations and colleges. This is correlated with data from the Clemson Agricultural Experiment Station.

Anyone who has traveled through the southeastern section of the United States has seen the red streams and rivers so common to our area. We know that this red color is being washed from the southern farms due in part to the poor cropping systems practiced. Every farmer that establishes a permanent pasture is making southern agriculture more permanent.
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ARTIFICIAL INSEMINATION
(Continued from page nine)

Breeders' Association. Mr. J. W. Kelly, a Clemson graduate in dairying, is the technician in charge. Another association was started in Greenville county in June, 1945, in cooperation with the Greenville Cooperative Breeders' Association. Mr. H. H. Hanna, a Clemson graduate in dairying, is the technician in charge. This year, Anderson, Chester, and York counties have adopted this program and will start operation in the early summer. Eventually all the county organizations will be organized into a state federated cooperative.

The semen is collected at Clemson on Monday and Thursday of each week and shipped to the association. The semen is shipped in thermos bottles which are carried in cork-insulated packers fitted with pre-cooled brine pads. Using this shipping method, the temperature of 35 to 40 degrees Fahrenheit is maintained in the thermos bottles during the trip from Clemson to the county association headquarters.

Approximately 2,000 South Carolina cows are now being inseminated annually by this program. After the other three counties get started, there should be approximately 5,000 cows bred by this method in South Carolina each year.

One should not think of artificial insemination as an emergency measure for "getting cows in calf". It is not a cure-all for breeding ills; in fact, there may be some failures, as in natural breeding, but the advantages of the use of superior germ plasm are sufficient to offset many failures.

Cooperative artificial breeding units make it possible for the small owner to use a much better sire than he could hope to buy because his herd is not large enough to justify the purchase of an outstanding bull. Artificial insemination is driving from the scene the scrub bull which has been responsible largely for the low production record of the average American cow.

ECONOMISTS IN AGRICULTURE
(Continued from page 11)

The agricultural economist must be able to help the farmer answer this question: "Will tomorrow's income be sufficient to pay off what I borrow on my farm today?" This is quite an important question and one which must not be skipped over lightly. As an example of just how important a question this is, it is pointed out that in 1919, to pay off $1000 of debt, it took only 2033 pounds of flue-cured tobacco or six bales of cotton, whereas in 1932 to pay off a similar debt it took 8,621 pounds of flue-cured tobacco or 31 bales of cotton. We can see from these figures just how important it is to the farmer to have qualified counsel before he takes on such a financial burden as farm ownership if he must borrow money to assume this burden. For a person who has the money to pay for a farm outright, it is important to him to know the answer to this important question, too, so that he may not find a large investment shrunk to a mere fraction of its purchase value.

The banking interests have recently been giving much thought to the idea of employing agricultural economists to assist them in making and servicing farm loans. They are of the opinion that a man trained in agricultural economics is better qualified to give advice as to the worth of the farm and the likelihood of loss through backing a farm enterprise than is a man with a background in banking or accounting. We are, indeed, proud of this new recognition of the efforts of the agricultural economist.

A third branch of agricultural economics that is quite important in some section of the country is work with farmers' cooperatives. That there is a definite need for a cooperative is the first thing that must be determined before even the preliminary steps in organizing a cooperative are taken. It has been found that unless there is a definite economic need, a cooperative is almost always doomed to failure. When there is a need for a cooperative, the agricultural economist is in a position to render valuable assistance in its organization and operation.

A phase of agricultural economics in which Clemson has been doing a great deal of research is that of economic surveys. There have been a great many agricultural-industrial surveys made of various sections of South Carolina. These surveys have revealed quite a few startling facts about the economic possibilities and limitations of the communities surveyed, and have helped point the way toward a more prosperous economy for these communities. Research on land values has been very helpful as have other studies in land ownership and tenancy, farm taxation, and the economic and social impact of farm mechanization.

The compilation of agricultural statistics is another duty that agricultural economists perform. Besides a knowledge of agriculture and economics, the agricultural statistician must also have a thorough knowledge of statistical methods.

The Agricultural Economics Department at Clemson also assists other departments and agencies with surveys and tabulations of data in their departments. There is available in the department a complete punch-card tabulation outfit and the services of skilled operators.

There has been, and still is, in some quarters, concern only about how much can be gouged from the soil with no concern as to its future productivity. A study of the social and economic effects of this and countless other agricultural policies and methods of production, and counsel on economic matters pertaining to agriculture are the fields of the agricultural economist. His means of obtaining and analyzing his data are undergoing constant change and improvement, and become more and more efficient as time passes.
Dr. Wade Stackhouse and Borden Company Present College With Student Aid Funds

The Announcement of a new scholarship and of a new loan fund established for the benefit of students in the School of Agriculture was announced recently by Dean H. P. Cooper. The scholarship is for undergraduate work at Clemson and the loan fund serves as an aid to ambitious Clemson graduates who give promise of becoming leaders in research.

The Borden Company Foundation, Inc., has included Clemson with twenty-three other colleges and universities as suitable institutions in which to establish Borden Agricultural Scholarship Awards. Their purpose is to stimulate and recognize scholastic achievement by undergraduate students in agriculture. The award is to be in the amount of three hundred dollars annually for a five-year period. A Borden Scholarship Committee composed of Professors J. P. LaMaster and B. E. Goodale has been appointed to make the awards under the following rules:

1. All senior students in the School of Agriculture of Clemson Agricultural College who have included in their curricula two or more dairy subjects shall be eligible for the Borden Agricultural Scholarship Award. The award shall be presented to that eligible student who has achieved the highest average grade of all similarly eligible students in all college work preceding their senior year. The amount of the award shall be paid to the recipient during the first semester of his senior year.

2. In the event that the committee finds it inappropriate to make the award in any one year, the award may be deferred to a further year. Only one award, however, will be made during any one year.

3. Transfer students with two semesters work at Clemson will be considered. All transferred credits will be evaluated in combination with Clemson credits.

The first one of these awards was made on December 2, 1946, to J. W. Dantzler, a senior student, majoring in Dairying, with an accumulated grade point ratio of 4.83. The students that were eligible for consideration for this first scholarship were: A. E. Bobrow, T. S. Bowers, J. W. Dantzler, M. B. Edens, J. C. Hiers, W. F. Irwin and B. J. Stanek.

Stackhouse Loan Fund

The Dr. Wade Stackhouse Loan Fund is an endowment in the form of a gift from Dr. Wade Stackhouse, of Dillon. His father, the late Mr. Hugh Milton Stackhouse who was at one time a trustee of Clemson, served as Head of the Fertilizer Inspection and Analysis Department at Clemson for 26 years. Dr. Wade Stackhouse is a prominent retired physician, and a noted cattle breeder and farmer. He is greatly interested in more and better research for South Carolina. "It is my desire," Dr. Stackhouse said, "to see more Clemson men win national recognition, and I hope my donation may induce people of wealth to give Clemson College more money for specialized training."

The fund is designed to furnish assistance through loans to outstanding Clemson graduates who give promise of becoming leaders in research. Loans from this fund shall be available to students who desire to undertake graduate work in Agriculture, Chemistry, Engineering, and other similar fields that the Trustees of the Fund may authorize. It is hoped that upon completion of their training the beneficiaries will spend at least five years in South Carolina, if possible.

The Trustees of the Fund are: The President of Clemson College, Dr. R. F. Poole; The Director of the Clemson Dairy Department, Professor J. P. LaMaster; or their successors in office. Each year the Trustees of the Fund shall select one or more outstanding graduates who may be eligible to receive a loan from this fund. The beneficiaries shall have a period of five years after completion of their graduate work in which to repay the loan at an interest rate of 4 per cent.

Under the terms of this fund there has been one loan which was made to Gordon Goodale, a Chemistry 1945 Clemson graduate. He took his graduate work at the University of North Carolina and received his M.S. degree in Chemistry in December, 1946. He is now teaching at Salem College in Winston Salem, N. C.
MAKE HOME TANNING YOUR HOBBY

(Continued from page four)

er dissolve four ounces of washing soda (crystallized sodium carbonate) and eight ounces of common salt in one-half gallon of water. Now pour the salt-soda solution slowly into the alum solution while stirring vigorously. This makes your tanning solution. This combined solution should then be mixed with enough corn meal, rye meal or wheat flour to make a fairly thick paste.

Now tack the cleaned, damp skin on a board or any flat horizontal surface, flesh side up, and coat it about one eighth inch thick with the tanning paste. Cover the coated skin lightly with papers or cloth to retard evaporation and let stand for twenty-four hours.

The next day scrape off the first coat of paste and apply another one in the same manner, and at intervals of a day repeat the process until three or four applications have been applied, depending upon the thickness of the skin. Leave the last coat of paste on the skin for three or four days then scrape off and wash the skin in a solution made by dissolving about one ounce of borax in a gallon of water. Follow this by rinsing in plain water and then squeeze out the excess water with your hands.

Now lay the skin out flat and apply a coat of neat'sfoot oil to the flesh side. When it becomes nearly dry but is still slightly damp and flexible take it down and work it thoroughly. There are several ways to do this: (1) Pull and stretch the skin between your hands; (2) Pull it back and forth across the back of a chair in a shoe shining motion; (3) Roll it up, flesh side out and pull it back and forth through a looped rope. This is one of the most important steps in tanning and much of the success in obtaining a soft, pliable pelt depends upon this repeated working. In fact, anything you can do to keep the skin in motion while it is drying will make it just that much softer. It must be worked while drying, however, not after it has dried.

You should now have a nice, soft, well-tanned skin, but if it should still be a little hard in spots the hard places may be dampened again and reworked while drying the same as before. If the flesh side is a little rough or soiled after drying it should be sanded with medium or coarse sand paper.

Another Salt-Alum Method

This is one of the oldest and simplest methods of tanning. It is suitable for both light and heavy hides and produces a strong and durable leather.

The skin should be cleaned and fleshed as already described, then put the entire skin into a solution made by dissolving one pound of alum and one pound of salt in four gallons of water, being sure that all parts are covered. Stir the solution at least twice a day and churn the skin up and down a few times to enable all parts of the pelt to come in contact with the liquid. Examine the hide after a day or two to see if there are any hard, flinty spots. If there are any such spots place the hide over the beam and shave the hard places down with a sharp knife until they are soft as the surrounding areas.

Small skins will tan in about two days in this solution and it will of course take longer for heavy hides. It usually requires about a week for a medium size deer hide. Be sure to leave the skins in long enough though. It will not hurt to leave them in several days longer than is actually necessary. The skins can be tested from time to time by cutting a small slit in the thickest part of the skin. If the leather is white all the way through it is tanned, but if it still appears raw on the inside it should be put back in the liquid a day or two longer.

When the skin is tanned wash it thoroughly in plain water, then in the borax water and finish it exactly as described in the previous method. If it should be a heavier hide, however, apply a more liberal coat of oil.

The Salt-Acid Method

The salt-acid method of tanning is exactly the same as the one just described except the tanning solution is made by dissolving two pounds of salt and one ounce of concentrated sulfuric acid (by weight) in two gallons of water. This solution should be kept in stone jars or wooden barrels, never in a metal container since the acid would attack the metal. Always be extremely careful when using such strong chemicals as sulfuric acid. Avoid getting the acid on the hands or clothing, and when mixing the solution always pour the acid slowly into the water. Never pour the water over the acid.

This method of tanning produces nice, soft leather but it is not so durable as that obtained by the previous methods.

Making Buckskin

Real buckskin is made from the skins of deer, though some other hides are sometimes called buckskin. To make this product the skin should be fleshed as already described and then thoroughly relaxed in plain water. While it is still wet and soft put it in a lime water solution to loosen the hair. This solution is made by adding about a pint of ordinary builders lime (slaked lime) to each gallon of water used. If you can secure hard wood ashes a pint of this to each pint of lime will hasten the loosening of the hair, or a very small amount of lye may be added in place of the ashes. Leave the skin in this solution for a few days or until the hair becomes very loose. The skin should be stirred around at least twice a day so the lime can reach all parts of the skin. When the hair is very loose lay the skin over the beam and scrape the hair off with a dull knife or block of wood.

It is now necessary to "kill" the lime so that it does not continue to work and weaken the hide. To do this soak the skin in plain water for an hour or two, squeezing it out from time to time. Then soak the skin in a mixture of one and a half ounces of lactic acid to four gallons of water. The hide should be soaked and rinsed in this for an hour or more and then rinsed in plain water. If you are unable to get the lactic acid the lime can be removed by several thorough washings in soapy water followed by rinsings in plain water, but this is a more laborious process and must be done very thoroughly in order to remove every trace of the lime.

After this the hide may be tanned by one of the processes already given.
Review of Current Agricultural Publications

Given below are short reviews of a few of the many South Carolina Experiment Station and Clemson College bulletins and circulars. Copies of these bulletins and circulars may be obtained free of charge by writing to the Bulletin Room, Clemson College Library, Clemson College, S.C.

Extension Service Circulatns

291—Tobacco Plant Production in South Carolina. A discussion of tobacco plant production suitable for South Carolina. Would be of interest to all tobacco farmers and those connected with tobacco production in the state.

292—Small Grains in South Carolina. This publication gives recommendations for varieties of seed to use, soil preparation, rates of seeding, etc., for all small grains planted in South Carolina. It lists favorable rotations, insects and diseases control along with weed control for each small grain individually. It deals also with the various uses of the grains, as the winter cover, grazing crops, and gives a variety of feed mixtures for livestock and poultry. Would be of interest to all farmers, particularly those who grow their own feed for poultry and livestock feed.

294—the Agricultural Outlook for South Carolina 1947. Outlook reports for transportation, farm machinery, fertilizers, lumber, and land prices. Principal agricultural crops are discussed as to such facts as to production, prices, and estimated demand. Would be of interest to all who are in any way connected with agriculture. Co-op organizations along with bankers, newspaper editors, and all agricultural workers should have a copy of this publication.

295—the 1946 Cotton Contest. Information given concerning the Cotton Contest to be held in the year 1947. Results of the 1946 contest such as varieties used, yields, winners, and etc. are given. All farmers who entered the contest last year and all who plan to enter this year should have a copy.

296—Using “Triple-A” Tools for Better Farming. A discussion of soil building practices authorized by the AAA. Also specifications, payments by the government, and advantages and disadvantages of each practice. Every farmer should have a copy plus other who guide and aid farmers.

Experiment Station Bulletins

71—Freezing Preservation of Food Products. A discussion of the freezing of fruits, vegetables, and poultry. Recommended varieties, adaptability for freezing, and types of containers to use for each of the various vegetables and fruits. A must for all who own home freezing units. Freezer-locker plants should have a supply to give to customers. Also of interest to those considering using this method of food preservation.

72—Postwar Employment Opportunities in an Agricultural Community. Results of a survey of the Hollywood community in Saluda County by the State Department of Education and the Department of Agricultural Economics and Rural Sociology at Clemson. Deals with opportunities for employment during the post work period and the number of persons in temporary work and military service who will return to farm. Of interest to County Labor Assistants, returning soldiers, and high school and college youth who plan to return to the farm.

73—Cotton Ginning Equipment and its Utilization in South Carolina. A discussion of the processing of agricultural products. Data on cotton production, the number and size of cotton gins and the use of certain types of ginning equipment. The change which has occurred in South Carolina is also discussed. An excellent analysis of the physical plants of South Carolina's ginning industry as to kind, age, amount of ginning equipment plus the relationships between these factors and the volume of ginning done by individual gins. Of interest to all ginners, cotton farmers, cotton buyers, and others connected with cotton production.

364—Sweet Potato Production Possibilities in South Carolina. A discussion of the relative productivity of sweet potatoes on different soils commonly found in South Carolina. Labor requirements for sweet potato production plus relative returns on the crops in comparison with other money crops in South Carolina. Useful to County Agents and those interested in Sweet Potato production.

366—Inspection and Analysis of Commercial Fertilizers. A report by the head of the Fertilizer Inspection and Analysis Department. Gives comparisons of different fertilizers that were analyzed as to nutrients plus other information. Useful to all fertilizer dealers and to ALL who must buy commercial fertilizer.

South Carolina despite the fact that peaches of greater quality can be canned and frozen from home grown varieties. Also, milk and dairy products are imported when highest quality butter, cheese, and milk could be produced in this state. The branch, creek, and river bottom lands can be transformed from briar and scrub growth into grass and pasture lands as a means of abundantly supplying these products.

The second problem is finding means of convincing poor farmers of the advantages of applying approved practices. There is much evidence and demonstration of poor practices throughout the state that any farmer, regardless of his financial status, could correct. Improving the soil, use of good seed, and proper fertilizer, diversification values, good and well fed animals are matters that must be understood and practiced by the farmer of both large and small acreage alike if the state is to maintain progress and the farmer is to obtain a more satisfactory livelihood. Great improvement has been shown by the small farmer class in recent years and it may be that further education will finally be the solution.

We must visualize the picture of South Carolina as a continuous and progressive state. We understand and comprehend the values essential to obtaining and maintaining progressiveness. Therefore, we must solve the problems not only of the farmer but those of industries that absorb the products of the farms to the end that production and marketing of the products of the forest and farm may return to South Carolina their full worth.

—R. F. POOLE, President

THE AGRARIAN
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