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Terracing for Soil and Water Conservation

By A. F. BURGESS, '41

It is estimated that erosion removes not less than 126,000,000,000 pounds of plant-food material from the fields and pastures of the United States every year. This is more than 21 times the amount removed by crops. The annual financial loss amounts to about $200,000,000.

Since Colonial days American farmers have built various hillside ditches to conserve the soil on cultivated fields. Terraces are almost as old as agriculture itself. In the United States hillside ditches and furrows were the fore-runners of the present-day terraces. Later farmers in the South began to use ditches and furrows across the slopes of their fields to intercept run-off and erosion. Before the introduction of the wide-base terrace the narrow-ridge terrace had been used. These narrow-ridge terraces could not be cultivated and were allowed to grow to grasses and briars. Although the old-type hillside ditches or terraces failed frequently they were sufficiently successful to induce farmers to continue their use year after year.

Later, a wide-base terrace was introduced so that tillage operations could be conducted over the entire terrace. A modification of this type of terrace is widely used today.

Early in the twentieth century, investigations of the use of terraces to combat soil erosion were begun. In 1929 Congress appropriated an initial sum for the establishment of Federal experimental erosion farms in cooperation with the States. They are located in regions representing wide differences in soil, climate, and farming practices. An important phase of the work on these farms is the experimental study of the capacity of terraces, their effectiveness, design, spacing, construction, and maintenance, and their relation to soils and cropping practices and to the operation of machinery.

Erosion injures fertile lands in a number of ways. The upper and most fertile parts of the soil are washed away until the land becomes barren and unproductive. Deep gullies are formed which means an actual loss of cultivated land.

Erosion is chiefly caused by the direct action of heavy rains beating upon the ground; by the rapid movement of the rain water down the slopes of the land surface, and by the combined action of the freezing and thawing of saturated soil, followed by heavy rains. The steeper the slope the greater is the erosive action of running water.

Often the upper soil is washed away over wide areas when the water is fairly uniformly distributed over the surface; this form of erosion is known as sheet erosion. Where channels are washed down the slopes and by the concentration of large volumes of water gullying occurs. This

continued on page 29
The Entomologist and the Live-at-Home Program

By F. K. HINNANT, '41

"Important is the work of the entomologist—research, education, experimentation"

Everyday, more and more farmers throughout South Carolina are realizing the need for less specialization; are turning to the "live at home" farm program, a policy which calls for a wider diversification of farm crops and practices is rapidly being pushed into the background. Changed conditions due to factors such as foreign situations, increase in efficiency in manufacturing and distribution have lowered the purchasing power of the South’s cash crops and brought on this need of a live at home policy. A pound of cotton right now will buy less than 2/3 as much of the things farmers buy as a pound bought in 1913, yet the cost of production is the same on the average.

Farmers, through experience and the educational facilities provided by the extension service of the State Department of Agriculture in conjunction with the U. S. Department of Agriculture, are fast realizing that the diversification of crops and farm practices provide a cheaper and higher standard of living than the specialization policy; that the major necessities can be produced at home and the cash crop raised can be utilized in other ways with a greater saving.

The entomologist plays a vital part in this picture. He is needed more in the "live at home" program than ever before. Crop failures due to insects would be just as disastrous to the "live at home" farmer as they would to the specialist. The farmer practicing diversification also has more problems to combat as he has more different crops to attract many more different insect pests. Then by the old geometric axiom the entomologist has not just one or two problems but many. He can no longer sit at a desk and send out information on the control of the comparatively few insect problems the specialist farmer presented. He is needed here, there, and everywhere at once with one single insect presenting different control problems in different parts of the state.

Contrary to thought, a control for a single insect may not be the same in every area inhabited by that insect. There are many factors which influence this and these factors are not the same everywhere. Presence of other insects, other host plants, type of soil, seasonal variations as applied to planting and harvesting dates as well as insect's life cycle all play a major role in the elucidation of the control problem. After all of this is taken into consideration and the control found, it must be practical, economical, and effective.

To expound further on this situation let us use the cotton boll weevil for example. Dusting with calcium arsenate is not advocated as a control on the sandy soils of the coastal plain where as this is perfectly permissible in the piedmont region.

Then suppose the cotton farmer wanted to change to the "live at home" program; planting alfalfa, or other forage crops; having a small orchard, a garden, poultry, and livestock besides his usual cash crops. Making a conservative estimate, there may be as many as four insect pests on the alfalfa, as many as three insect pests on an average for each garden crop, four pests in the orchard and several on each type of livestock and poultry. This would add up to approximately twenty-five or more insect pests that the "live at home" farmer would have to match wits with if the entomologist were not near at hand.

With the "live at home" program the entomologist is also confronted with the problem of increased costs of insecticides. Whereas the specialist with large acreage and few pests buys continued on page 30
Southern Plantations Today

By E. P. HUGUENIN, '41

“Capital versus labor, tenant versus planter. Today’s plantations are striking examples of 1940’s economic war.”

Cotton is still King in the South, and the cotton plantation remains one of the dominant farm organizations. Although the typical plantations that flourished before the Civil War have changed, this change was more outward than inward. The same characteristics exist: large-scale ownership of the land and the tools of production; concentration upon cash crops; supervision by the landowner; and cultivation by an all too plentiful source of cheap labor.

Cotton is raised today on a large scale in the same areas of the South that produced the larger part of this nation’s cotton before the Civil War. A large part of this old plantation land is now operated by tenant farmers and sharecroppers. The astounding increase in tenancy, especially white tenancy, is one of the most striking trends in the agricultural field in the last half-century. In 1860 the vast majority of white agricultural workers were owners, in 1930 more than three-quarters of a million white families in the old Southeast had become members of the tenant and laborer class, a group that is heavily populated without this added hardship.

The plantation is an important factor in the social and community life in the South. Just as the more wealthy urban inhabitants set the pace, so do the large plantation owners. It is only natural that they should be very influential in the community life through the prestige of large-scale ownership. In true plantation areas, land ownership is highly concentrated, and the proportion of tenants among operators is high. Income in such areas is greater than in other Southern agricultural communities, but much lower than in other sections of the nation that don’t concentrate on cotton so extensively.

A common argument against attempting to improve conditions among tenants and sharecroppers is that these people are incapable of bettering themselves or of taking advantage of outside aid. Careful observation indicates that much of their backwardness is due to lack of opportunity. The families are usually large and schools are relatively poor, especially the schools for Negroes. Health services are inadequate to a marked degree. Diet among these families is far below standards accepted as adequate, even for emergency subsistence. The three M’s—molasses, meal, meat—constitute the major portion of the diet. An astoundingly large number don’t even have a garden, or a cow.

This pattern, this almost complete reliance upon a single cash crop for the years’ income, has made the plantations abject subjects of King Cotton. When their Lord and Master is in good health, they attain the pinnacle of prosperity, but when he suffers a slump the depths of despair are reached. With all this, cotton will remain the principal crop in these areas for years and years to come, simply because it is best suited by reason of climate, and location to its production. The old days of controlling labor, under a one-crop economy, are gone, but the system of tenancy perpetuates many of the evils of the old system and none of its virtues. It is true that it works for the plantation operators but it’s at the expense of the poor tenant and laborer. The operator must accept great responsibility if the labor of these groups is to be made profitable. With all this he must have skill, energy, and a knowledge of cotton farming; he must be able to plan and assign the crop acreage to the best advantage, handle financial matters, manage his labor force and stock, and supervise advances for subsistence. Usually the operator is expected to look after the social and community affairs of his tenants. On the large plantations he is assisted by managers, overseers, and gang bosses, but on the smaller plantation he does all this himself.

Operators, bankers, merchants, tenants, croppers, and laborers alike are affected by the plantation system. Because they are all dependent upon a cash crop which has a fluctuating market, their incomes are bound to be highly unstable.
Some Reflections on the Present Crisis

GUEST EDITORIAL

By Dr. B. O. WILLIAMS
Former Professor of Agricultural Education and Rural Sociology at Clemson College, now head of the Department of Rural Sociology at the University of Georgia

When one observes the things going on in the world today, he can only wonder what will come out of the debacle. We are passing through a major world catastrophe. The American people are girding themselves for whatever part they will have to play. The least the country may be expected to do is to stand firm and be ready and prepared to repel invasion and to defend its way of life.

It would hardly be possible to sit down to write or to think at the present time without first weighing the possibilities that lie ahead. In a crisis, people inevitably think of their own survival. Recognizing this, the people of America are making themselves ready, not for aggressive combat or assault, but for protection; as when a mother bird protects her young against the storm, or against intruders that threaten the home nest.

During the World War there appeared several editorials in The Chronicle, a literary magazine formerly published at Clemson, dealing with the war situation and with the participation of Clemson men who were leaving by the scores for the army. One of these editorials, entitled "Answering the Call", closed with the following: "Our greatest desire is that they may help win this war and return to their fatherland where they may live in peace and happiness and enjoy the fruits thereof, for 'peace hath her victories, no less renowned than war.'"

We felt that that war was a war to end war. Not so, however, for the monster has reared its ugly head again. The world is effervescing with the same toxins that poisoned the good will of the world and set off the embers of hate a quarter of a century ago. We must now, as then, turn to future hopes for world peace and serenity.

But that war came to its end, if only for a time; and this one, too, will as surely, at some time and in some way, reach its Armistice Day. The setting now has many implications. As a people we must re-kindle our patriotism and recognize the dangers confronting us. To that end we must do whatever is necessary to put our National house in first-class order. But, in addition to this, we must have greater vision than we had in the last war; for then we did not anticipate the problems that would come with peace. The crisis must command the major effort of the people for the present. Nothing must be left undone. However, there should be a parallel objective of the preparation for peace running concurrently with defense preparation and national protection.

Following in the wake of the existing emergency there probably will come a series of conditions that may be, to some extent, anticipated in advance. Price inflation is bound to develop, for nothing breeds inflation like inflation. After the crisis there will follow a drop in prices. This will have many and varied effects. Productive capacity that has been geared for war output will be curtailed, and many necessary readjustments in industry will have to be made. Land and property values, which will have risen in the crisis, must inevitably fall to lower levels. Demand for goods utilized in military and naval activities will drop off with the return of soldiers and sailors to private life. Farm lands, brought into use to speed up the growth of food and feed for the army, will not be needed. The debt structure, which will have increased to high proportions, will have to be gradually whittled down. Taxes of necessity will rise, countless problems of a similar nature will be faced.

In the meantime, other problems are developing in this country. The nation is maturing, the birth rate is declining, and the population is growing older. Mechanization and technological methods are infiltrating into agricul-
ture. This is creating great shifts in population and freeing large numbers of farm people for other pursuits, or for unemployment. The old frontiers of free lands and of industrial advancement have been either exhausted or are slowing down in their demand for labor. The net effect of all this is to create new problems that will have to be faced after the present crisis is over. For South Carolina, if we are to act with intelligence and efficiency, the preparations must take two main courses.

The first of these has to do with the state’s youth problem. Since approximately one-half of the total population of the state is under twenty years of age, and consequently within the broad range of school age, the people have a tremendous responsibility to provide a sound, efficient, and utilitarian program of education.

Of every 100 white children entering the first grade in the state’s public schools, it has been estimated that 60 drop out by the end of the seventh grade; 80 drop out by the end of high school; 93 stop between high school and the time for entering college; and 97 have dropped out before the end of a four-year college term.

Perhaps 90 percent of the total time lived by the pupils after finishing school will be spent in two ways—as a member of a family, or as a member of some occupational group. Also it is probably true that three-fourths of the children of South Carolina will spend their lives within a radius of 25 miles of where they now live. This means that they will live, broadly speaking, in their present communities.

Under these circumstances, the masses of children must be reached down in the grades. Their training must acquaint them with the essential elements that will be needed in their future lives; namely, with the problems of their communities, with the place, importance and problems of family life, and with the nature of the occupations that are available to them.

In the second place, about two-thirds of the farmers of South Carolina are tenants, and a large proportion of these farmers do not grow their living on the home farm. Approximately 46 percent of the tenant farmers in 1935 had been living on the farm they were then living on for less than one year. This means a high rate of shifting from farm to farm by the tenant farmers. Perhaps from one-fourth to one-third of them change farms every year.

The soils of the state need lime. A livestock program cannot be achieved until the acidity of the soils is corrected and until the excessive mobility of farm tenants is checked. Fortunately liming of the soils to correct the acidity may be done cheaply and it is a pre-requisite to growing the grasses, hays, legumes and grains that are essential for livestock production and for the prevention of soil erosion.

Not only for the long pull, but for the sake of national defense during the emergency as well, it is both essential and urgently necessary that our farmers get on a live at home basis. They should grow their chickens and eggs, their milk and butter, pork, vegetables and fruits on the home farm. If all our farmers could be persuaded actually to do this, it would mean a great contribution to national defense and to state defense. But, above all, it would mean the defense of our farm families against the vicissitudes that will come when the crisis is over and our people are called upon to make the re-adjustments to the factors mentioned above. A people who are educating their children for life’s problems, and who are producing their living at home, will be a toughened people and they will be prepared to meet the demands of the most difficult situations. A state in which this kind of people live will be a strong state, a durable state, and a great state.

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SOUTH CAROLINA PEACH GROWERS ASSOCIATION
Electric Fences

By J. C. P. AGNEW, '41

Of all the new electrical farm equipment that has come on the market during the last few years, nothing has been received by dairymen and farmers with as much enthusiasm as the electric fence. The actual construction cost of electric fences compared to various types of other fences indicates a saving of approximately 80 percent. Until the present, construction has not been an easy job. The time often required for building temporary fences when following improved farm practices has not been available during the summer days when other farm work required attention. Very little time is required to build an electric fence, so this type of fence is used mostly where one wishes to build a temporary enclosure.

An electric fence is a barrier to animals or fowls, consisting of an electrified conductor and an energizing and controlling device. An electrified conductor may be wire, ribbon, tape, rod, tube, plate, mesh, or any other form suitable for its purpose, but may be referred to simply as the fence wire. The energizing and controlling device is the device by which the fence is electrified and may be referred to as simply the controller. A battery controller is one for which the power source is a battery or batteries limited to less than fifteen volts. An alternating current controller is one for which the power source is alternating current at voltages normally supplied by electricity distributing agencies. A converter is any device used to allow a battery type controller to be supplied from an alternating current source or from a direct current source of fifteen volts or more.

The general sources from which controllers may receive their energy are 110-volt power lines, either dry or wet cell 6-volt batteries, or 32-volt farm plants. The 6-volt type has the advantage of being easily portable and may be located wherever convenient or where other electricity is unavailable. It is also safer because of the low voltage source of current. No data is available as to the life of dry or wet cell batteries when used as a source of current for the electric fence. The electric current consumed by fence controllers averages from five to ten watts per hour, or around four to eight kilowatt-hours per month. The cost ranges from ten to twenty-five cents per month.

There are approximately forty thousand electric fence units in operation. The electric fence as ordinarily used consists of a single wire supported on posts or stakes which are about fifty feet apart. Barbed wire is preferred and its use is recommended over that of other kinds of wire. The barbs penetrate the hair and thick hides of animals that contact the wire. When the animal contacts the barbed wire, greater shocking effect is felt by the animal. There are many different kinds of posts that can be used. Probably the best kind to use is a small wooden post that can be driven into and taken out of the soil quickly and conveniently. The wire is fastened to the posts by porcelain insulators, and in some cases rubber insulators are used when properly fixed.

The areas in which most use has been made of the electric fence are in Wisconsin and Oklahoma, because of the activity of the manufacturing and electric companies in those states. However, use has been found for this equipment in most parts of the country. The most important use of this kind of fence is as a temporary fence. In many cases farmers wish to hog down their crops. This type of fence readily finds its place when used for this and similar purposes. Several electric companies have shied away from it because the state safety commissions are at a variance as to the safety of using it. Some commissions approve no electric fence controllers, some approve the battery units, and others have approved certain controllers of all types after exhaustive testing. Some states require the posting of signs where there is an electric fence.

A few home-made units have been used with success which operate only from storage batteries or dry cells. The home-made fences are usually unsafe and are costly in the long run, because they are not dependable.

It is important that the animals be properly trained. It is not the wire that holds the animals; it is the respect that the animals have for the electrical shock which keeps them where they belong. The training should be done in a
Field Selection of Seed Corn

By T. E. GARRISON, '42

Field selection of seed corn is profitable because the seed having a higher germination percentage will make a larger and better yield. It insures reliable, adapted, and disease-free seed. By experiment it has been known to improve the yield of corn four or five bushels per acre. Field selection is a practical and simple method of increasing yield and improving the quality of corn.

The best time to select seed corn is as soon as the majority of the ears are matured and before the first killing frost. Seed should be selected from plants that have green stalks and yellow husks. In early selection we can avoid the diseased ears, and many of the injuries caused by mold which develop on the ears in the field after maturity. If seed are selected after husking time we do not know whether the ears matured early or late.

The strain of corn that has shown uniformity of growth and maturity of plants in the field is the type of corn that we want for seed. Under normal field and weather conditions the stalks should be about the same height, ears should be at a fairly uniform height on the stalks and there should be few broken or prematurely ripened stalks. If the corn is badly broken down, it is an indication that the strain of the corn is unadapted, diseased, or that the soil lacks fertility. The parent plant represents about half of the percentage of all the kernels; therefore, it is habit of growth, health, and vigor that are vitally important. The parent plant should be an erect, strong stalk, and have a healthy root system. It should be free from diseases, vigorous and healthy. Ears selected should be borne at a convenient height for husking. There is a close correlation between height and time of maturity. Ears high on the stalk mature later than those low on the stalk.

The physical appearance of the ear is the final test of determining whether the ear is to be used for seed. The stalk may seem to be the best in the field but the ear may have certain physical defects rendering it useless for seed. The following factors should be considered when selecting ears: (1) condition of the shank (2) the size of the ear (3) maturity of the ear. The shank should hang down when mature but it should not be broken down next to the stalk. The shank should not be shredded or discolored by infection.

The size of the ear will depend upon the fertility of the soil, the length of season, and the normal size of the variety. The ears should be sound and well filled out, and all the kernels should be uniform in color, bright, shining, and dense.

Two or three times as many seed should be selected as will be used because we must follow for further selection during the germination test, final selection, and grading before planting. The seed should be stored where air can circulate freely among the ears. It is necessary that the corn be thoroughly dry to prevent injury from mold and freezing.

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Edisto Farms Program

By J. B. GUESS, '41

Edisto Farms was originally a cotton producing farm located at Denmark, S. C. When the boll weevil came in 1919, Mr. Guess started looking for a new income from his farm. He could not decide the best way to market his farm products so he tried raising Hampshire hogs, Hereford cattle, and Guernsey cattle. After a few years he dropped the raising of hogs and beef cattle and continued with his Guernseys.

His first registered females were ten pure bred heifers purchased from Mr. M. M. Hollinsworth, of Landeburg, Penn. Mr. Guess's next job was to purchase a bull which would give him production since he was selling milk. Naturally he wanted his cattle to have both type and production but he was more interested in the latter. The bull he decided on was Rose Vista Cyclops who was a son of Glen Gable Girl and a grandson of Langwater Dairy maid. Dairy maid was one of the highest producers with good type of the Guernsey breed at this time. Cyclops started the herd off on the "right" foot by sireing daughters with plenty of size, high production and good type. In a few years Mr. Guess was up against the same problem again. He knew he wanted a bull to follow Cyclops. After writing to some Guernsey breeding friends and studying pedigrees, he decided to get another grandson of Langwater Dairy maid, Florham Jeweller. Jeweller's dam had a higher record than Cyclops' dam and therefore his daughters were bigger producers than, but held about the same type as Cyclops. By now the herd was steadily growing in size as well as increasing in production. The next bull brought into the herd was Foremost Baron, a son of Lang water Foremost and also a son of Glen Gable Girl. He fitted in very nicely since he was a half brother to Cyclops. Baron improved the type and also helped increase production. His daughters were by far the most desirable up to this time. Their udders were well attached and the teat placement good. Baron only lasted a few years since he was seven years old when purchased. The next bull to come into the herd was Cornelia's Supreme who was out of a daughter of Langwater Foremost and a grandson of Mixter May Royal. Supreme has more producing daughters in the herd than any other bull. They are all high producers with good type. The bull selected to help Supreme was Klondike Kadi. Kadi is another grandson of Langwater Foremost. He is now about seven years old and still in active service in the herd. All of his daughters have very nice type and udders that the Guernsey breed has long been looking for. Two young bulls that are also in active service along with Kadi are Majesty's Babe Ruth who is also a grandson of Mixter May Royal, the same as Supreme. His oldest daughters are about ten months old and are all nice, flashy looking heifers. The other young bull is Edisto Farms Challenger. He is a son of Cornelia's Supreme out of Jeweller's Connie, a daughter of Florham Jeweller.

continued on page 21
Saddle Horses for Pleasure

By R. C. WIGGINS, '42

“Horses are a large solid-hoofed herbivorous mammal”; they have been domesticated by man since prehistoric time. The horse is used as a beast of burden, as a draft animal, and as a riding animal. Today the saddle horse is used in connection with the pastimes and sports of many nations.

The saddle horse is considered by many people to be the most stylish, beautiful and finished of all horses. Because of the popular standing he enjoys, he is judged by rigid requirements. These are beauty of conformation, attractiveness of form and action, sure-footedness, saddle action and knowledge of gaits.

Beauty of conformation of a horse involves a cameo-like head in sharpness and clean-cutness; consequently a horse has a refined neck, sloping pasterns, shoulders that are moderately high, and neat withers. An ideal saddle will have a head showing a kind disposition and a high degree of intelligence. A “weedy” neck, one that is lacking in muscular development is not desirable. Lots of attention must be given to the slope of pastern and shoulder, for straight pasterns and shoulders are more objectionable in the saddle horse than in any other breed of horses for they tend to make the horse an undesirable rider; height and refinement of withers are essential for the same reason. However, if the horse has flat withers, the saddle cannot be made secure; this being true of the side-saddle. A straight or roached back does not afford an easy ride; nevertheless, there should be a degree of spring without any weakness of swayback structure. The saddle horse is upstanding, and the head and tail is smartly carried. Sure-footedness is vital in a saddle horse. If he isn’t surefooted it is dangerous to the rider.

The most highly improved of the world’s saddle horses are the English Hunter, the Arab and the American Gaited Saddle horse. The hunter is more of a type rather than a breed.

The Arab and the American saddle horses are the most interesting of the known breeds of saddle horses. The Arabian horse, which is not the most ancient of the Eastern breeds, has exercised a wide influence on the horse-flesh of the world.

A pure-bred Arabian horse has great courage; he possesses the senses of balance and harmony, power and substance, and has elastic and graceful movements. He is gentle, affectionate, and fearless. He has plenty of strength, which enables him to carry heavy riders. He has a great constitution and excellent staying power. While he is not noted for his speed, he can perform long journeys across country with considerable ease, such as those requiring super-endurance. The head of the Arabian horse denotes superior character and intelligence, and the forehead is broad and full with the head tapering toward the nose more than any other breed of horses. The eyes are soft and intelligent; the ears are of silky texture and always pointed inward. In general outline the head is lean and clear cut, which represents high spirit. The neck is of medium length and holds the head gracefully. The shoulders are long and sloping. When the saddle point of view is considered, the shoulders look thick, and the withers look low and broad. His height ranges from 14 to 14.2 hands and he is often classified as a pony. His colors vary from white, gray, bay, chestnut brown but seldom black. The spotted or piebald and yellow colors are never found among the Arabs, though tan and yellow are common among the breed. The Arabian horse is largely limited to sports and show use.

The American Saddle horse breed was largely developed in Virginia, Kentucky, Tennessee, and Missouri, though Canadian horses were used to a small extent. Most of the development was done in Kentucky, and the breed is often called “Kentucky Saddle Horse.” The American Saddle horse shows more style in the carriage of the head and arch of neck and tail than any other breed. His courage and spirit, together with his docility give him special usefulness as a saddle. His head is clean cut and somewhat small, with a very slight dish in the face; the eyes are prominent, full and set wide apart; the ears are small, wide apart and very active. The neck is long and gracefully crested with head neatly attached. The shoulders are long and sloping with refined withers; on the other hand, the shoulders are sloping and in coordination with the well
Livestock for Permanent Agriculture

By M. I. Jenkins, '41

Intelligent livestock farming is both permanent and profitable for it produces a money making product and at the same time enriches the soil and increases its productivity. Although our soils never can be made as rich as the middle western soils, we can preserve and increase their fertility by the addition of organic matter as farmers in many parts of the world have done. Southern soils are principally deficient in nitrogen, phosphorous, and potassium. Nitrogen is not only the most expensive of these elements but it is required by growing plants in greater quantities than the other elements. Southern soils are also very acid; therefore large amounts of lime should be included in every fertility program. Livestock not only encourages an increase in the fertility of the soil, but it promotes a more advantageous use of the soil. Lowlands that are subject to flooding and hill sides that are too steep for intertilled crops can be most profitably put into pasture.

Grow crops, feed livestock, and return manure to the soil. Would it be cheaper to use fertilizer and green manure crops to increase the productivity of the soil? When food is consumed by an animal part of it is converted into animal products which are sold at a high price, part of it is used for energy and heat, but this part was made from air and water by the action of sunlight on the plant, the rest of the food is excreted as manure. The manure contains over $3/4$ of the fertilizer element and $1/2$ of the organic matter that was originally in the food. Do not sell feed off the farm. Feed it to animals and let them convert as much of it as they can into high price animal products, and return the unused portion (manure) to the soil to be utilized by another crop. The fertilizer elements that manure contains are responsible for only a part of its value. The organic content of manure is high and this is very beneficial to the soil from a physical standpoint. Many scientists believe that the principal value of manure is due to its content of little known but very beneficial constituents.

The growing of intertilled cash crops not only require the addition of expensive commercial fertilizers, but it also greatly stimulates the leaching and loss of necessary elements. Pastures and forage crops require comparatively little commercial fertilizers, and the manner in which these crops grow tend to conserve and preserve the nutrient content of the soil. By buying feed, especially feed high in protein, such as cotton seed meal, and by growing legumes for feed it is easily possible to increase the productivity of the soil by taking good care of the manure and adding all of it back to the land. Due to the high nitrogen content of manure produced by feeding large quantities of cottonseed meal it may be profitable to sell grain and buy cottonseed meal for feed.

The South has a good climate and a good market for animal products. Further north the soil is richer and it is easier to build and maintain the nutrient content, but in the south the soil is warmer and more active and the nutrients are more quickly and completely available. The north has few parasites for they are killed by the cold winters, but the warm winters of the south makes it unnecessary to have expensive shelters and the longer growing season is associated with long grazing season and cheaper gains. Great quantities of meat is shipped into the South from the West, meat that could be grown at home. Not enough dairy products or poultry are produced in the South to supply it's own needs. The southern housewife is not educated to buying high price cuts from well finished

continued on page 24
Effects of Climate on South Carolina Agriculture

By Z. T. Ford, '41

The climate of South Carolina is characterized by mild winters and long summers with an abundance of rainfall. The growing season throughout the state is long enough for the growth of most field crops. All farmers know that the distribution of the growing season rainfall determines his crop production to a great degree. The weather stations report an average of 48 inches of rainfall per year for a period of 53 years.

Another important consideration is the season of year that the majority of the rainfall occurs. This factor influences the kinds of crops grown in this area. A large percent of the rain in the Piedmont area falls in the winter months with light rains in the summer. In the coastal plain region, the opposite is correct, with most of the rain in the Summer. This fact accounts for the kind of crops grown in each section. The crops suited to the conditions of the piedmont are small grains, cotton, and some corn. The lack of rain in the growing season is the limiting factor in growing corn. The crops suited to the coastal plain region are corn, cotton, tobacco, truck crops, and others. The summer rainfall is necessary to produce these crops on a paying basis.

To get the best results on a farm, a farmer should know the main precipitation of the crop growing season for his section of the state. The figure inclosed gives this information. Additional information may be obtained by getting Bulletin 310, Types of Farming and Farm Business Studies in South Carolina, by J. L. Fulmer.

Under present conditions, the farmer may want to expand to some new crop that he has not been growing. By obtaining reliable information about the climatic requirements of the crop he will know whether he can successfully plant a fall garden, use his farm to plant truck crops, whether to grow corn, or plant small grains instead. The knowledge obtained in this way may lead to some soils being made very productive, which have made very poor yields in the past. The county agents and experiment stations are at your service to provide this information.

The abundant rainfall of the state brings up other problems in agriculture. In the piedmont area, the loss of soil or erosion is a major problem. In the coastal plain region, the problem is the necessity of drainage. This water passing through the soil also leaches much of the plant food from the soil. These and many others problems have to be reckoned with individually. Every farmer of South Carolina is urged to make a close study of the climate in his particular locality in order that he may reap the full benefits from his agricultural practices.

Cotton answered the lure of warm weather in August, forced economists to raise their estimate on the 1940 crop to 12,772,000 bales. Probably 3,000,000 of these will remain in government hands, bringing Federal holdings to a new height, 11,500,000 bales.

A new peanut hull insulation material is said to be almost as efficient as cork and is 35 percent cheaper under mass production methods.
Introduction to Research

By R. L. STODDARD, '41

The fundamental requirement of a good scientist is research. This holds true whether it be in the field of chemistry, bacteriology, botany, agronomy or any other phase of agriculture. Each year the agricultural colleges of America turn out thousands of "aggies," and the ability of the finished product depends primarily on the individuals background, knowledge, and experience in both the basic and specific courses of his major. If one is not well grounded in these fundamentals he will more than likely fail the crucial test whenever it may occur. Those graduates in any department of agriculture who gets fellowships to institutions of higher learning, civil service jobs, or work in commercial laboratories are invariably handicapped if they have not prepared a satisfactory thesis. Naturally, the schools placing the necessary emphasis on the importance of research turn out the most promising graduates, especially for future scientific work. Regardless of the type of work to be done by a graduate, whether it is personnel, statistical, or experimental work preliminary research is essential.

The Agronomy Department here requires of each student a thesis during his senior year; however, two seniors may work together on some topic of particular interest to them. This work composes not only literary research, filing, and resume work, but also Microscopic and practical experimental work. It is required of each pair of students to choose a subject that is new or has not been explored or completed; that is to conduct an experiment for the purpose of making a new record or collecting new data on the subject.

Most of the time a thesis topic is chosen because of its importance to or of its being a problem of farmers. Also theirs may be the desire to establish a new record on some project or to improve on some disease or insect control. This year the Agronomy seniors have chosen various topics as usual. Those who are interested in the soil direct their efforts toward that type of work. They study some particular characteristic of the soil or factors governing it. This year experiments will be carried out on such problems and subjects as "Work with Salt Water Flooded Soils of Lower Coastal Plains," "The Variation of the P. H. of the Solums of Ten Soil Series in Coastal Plain," "Lime Requirements of Some South Carolina Soils," and other topics related to soil types and soil surveys made in the state.

Those being more chemically inclined may run tests on the composition of plants grown under specific conditions or choose some title such as "The Ammonia Determination in Nutrient Solutions by the Thymol Hypochromite Method."

The group interested in field crops covers a wider range and generally contains the larger group of interested thesis workers. This group may be placed under three divisions: those interested in plant breeding, those working on field crop diseases, and those interested in the commercial product.

The field of plant breeding is relatively new and affords many opportunities for young geneticist. In this group one tries out or runs experiments on hybridization or selection and may work on such an experiment as, "The Use of Colchicine on Some Field Crops" to carry out his project.

There being numerous diseases at present to destroy or affect field crops there are quite a number of theses being run on diseases; including "The Treatment of Cotton Seed with Sodium Hypochlorite to Controlling Dampening off in Comparison with Ceresan," "A Determination of the Relative Toxic Effect of Ceresan and Other Fungicides on the Growth of Cotton Seedlings," and "The Variations in Germination of Cotton Seed Collected from Various Sections of South Carolina and the Effect of Ceresan and Sulphuric Acid on this Germination."

The commercial products of field crops vary quite a bit within each crop, being controlled by such factors as climate, seed used, cultivation and availability of plant food nutrients. Topics such as "The Characteristics of Cotton Fibers" are worked on to help solve problems which confront the farmers of our state.

It is by preliminary experiments of this type that one equips himself to fulfill the requirements of his B. S. degree. As a result—the methods used, the routine, and the technique of experimenting leaves an imprint upon the individuals thinking that will be immeasurable to him in the future. Since the individual who shows the most interest and initiative in working on his thesis later becomes the most successful.
The Good Earth

By H. S. Berry, '41

We all know that every source of food comes from the earth, but some of us don’t know that Fuller’s Earth is a commercial source for a bleaching agent.

Using flour mills in the manufacture of earths may seem rather strange, but there are quite a number of plants in this country doing just that. In fact, so important is this unusual use for milling machinery, that the domestic production of Fuller’s Earth in the United States has reached an annual value of $4,333,000.

Fuller’s Earth is not just another earth, but has unique properties that render it vital to modern industry, for all mineral and vegetable oils, fats and greases, tallow and waxes, must have some decolorizing treatment before reaching us in their finished states. To accomplish this, no better agent has yet been found than this strange, clayey substance (this hydrous aluminum silicate, with varying quantities of iron, oxide, lime, magnesia, and alkalis) which incorporates a peculiar and apparently unexplainable property of absorbing basic coloring matter.

In spite of the fact that Fuller’s Earth is of national importance, having been commercially produced in eighteen different states, in general, it has remained clothed in enigma. The reason for this is obvious: production areas are restricted and localized, while its commercial use is closely confined to one major industry, oil refining.

Occasional travelers on seeing modern industrial units which have sprung up “mushroom-like” usually in the most isolated sections, have marveled about it, frequently asking a few questions. Other than this, Fuller’s Earth’s contribution to our chain of industrial power seems content to remain in a state of oblivion.

But, in the producing areas of Georgia and Florida, Fuller’s Earth is real. It is emblematic of progress and prosperity. Through its vast resourcefulness whole towns have been built. Its payrolls have paid for schools and churches. It has added to the prestige of capital and the progress of labor.

The plants themselves are in most completely modernized and operated with the greatest efficiency, practically unanimous in the use of diesel-electric power. The crude clay is dried by means of giant oil-burning cylindrical dryers. The remainder of the process of manufacture is virtually the same as that used in milling flour.

There is nothing very complicated about the processing. It merely involves drying, reduction and separation. The clay is first given a preliminary crushing to reduce it just about egg size. Then, after going through the rolls, it is bolted through a combination of wire cloths and bolting silks, where it is graded according to its various sizes. Standard mesh sizes are 16 to 30, 30 to 60, 60 to 90, and 100 up, although there are certain instances especially ground grades of 200 mesh up.

The average selling price of the finished product is about $17.00 per ton.

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BETWEEN THE

Kappa Alpha Sigma

Kappa Alpha Sigma, the Clemson College Student Chapter of the American Society of Agronomy, recently entertained a group of Anderson College girls at the “Y” cabin. Marshal Walker headed the outing. Bob Stoddard spoke after a steak supper and Dr. G. H. Collings commented on the purpose of the club and its activities. Later, square dancing, the Virginia reel and bingo were enjoyed at the Parish House.

With the Grads

E. A. Burgess, soil technologist with the Soil Conservation Service in Anderson, was a recent visitor on the campus.

E. L. Thornton, formerly of Purdue University and one-time state chemist of Indiana, is now agriculturist with Royster’s Fertilizer Company.

O. L. Copeland is now working on his doctor’s degree at Penn State.

4-H Club

A number of the members of the Clemson 4-H Club took an active part in the 4-H rally held at the State Fair in Columbia, several of them serving on the various committees.

The enrollment this year is a record for the club, fifty-two names being on the roll. G. W. Jones is president, C. M. Eaddy is vice-president and Ben Leonard is secretary-treasurer.

The Dairy Club

The Clemson Dairy Club, under the leadership of president J. B. Guess, is fast becoming one of the most popular clubs on the campus. At present the club has eighty-eight members. Meetings are held bi-weekly and the programs alternate between club members and outside speakers.

Recent outside speakers have included Professor John Lane, who spoke November twelfth on “Seeking the Truth”, and on October eighth, Dr. D. R. Jenkins, Dr. B. O. Williams’ successor, made an interesting talk on New Zealand. On October twenty-second, J. B. Guess and E. L. Young discussed their trip to the National Dairy Show at Harrisburg, Pennsylvania.

A cordial invitation is extended to all persons who are interested in dairying and would like to attend the club meetings.

The Ag Fair

The Agricultural Fair, sponsored by the various agricultural clubs and fraternities, has been given the approval of college officials and plans are being formulated by a committee composed of the officers of the various organizations with Frank Kearse as chairman.

The fair, to be held in the spring, will have a number of exhibits representing the companies that produce goods which relate to agriculture in South Carolina.

AGRI-FACTS

A horse may choke on food that dogs can swallow with ease. While a horse eats a lot of food, his stomach capacity is only one tenth that of a cow.

Of 13 major nations only three, England, Belgium, and Australia, have a smaller percentage of their people gainfully employed in Agriculture than the U. S.

Guard fertility. Scientists say that it takes at least 400 years to build one inch of fertile top soil. However, this inch of top soil may be washed or blown away in a few years when cultivated continuously. Rotation and erosion control pays.

In 1934 there was enough money circulating in the U. S. for every man, woman, and child to have $42.46. How much do we have now?
Judging Team Trips
The Clemson Judging Team, which is sponsored by the Animal Husbandry Club, recently returned from a successful trip to Baltimore where the members participated in a judging contest. D. N. Simpson won a blue ribbon for placing first in judging hogs, while M. I. Jenkins placed second in each event. The Clemson team as a whole placed second on judging horses. Professor E. Hauser is coach for the team.

On November twenty-second, the team left for Chicago to take part in the International Cattle Judging Contest. The following men made the trip: J. E. Pace, J. N. Broyles, F. E. Wyndham, R. F. Wheeler, D. N. Simpson and M. I. Jenkins. This trip will take about two weeks.

Animal Husbandry Club
M. I. Jenkins, president of the Animal Husbandry Club, recently announced that O. H. Shipman won the essay contest sponsored by Swift and Company. Shipman will leave for Chicago early in December.

Mr. Jenkins also said that final initiation of new members took place on November twenty-first. The number of new members is twenty, bringing the total membership to fifty.

Agricultural Economics Expert
Mr. Dover P. Trent, of the division of State and Local Planning, U. S. Department of Agriculture, recently conferred with members of the extension department on the subject of better relationship between landlord and tenant.

In Denmark, milk is being sold in sheets. To restore the original liquid state, the dehydrated sheets are dissolved in hot water.

Soil rich in decayed organic matter will hold twice as much moisture as soil in which the humus has been depleted by continuous cropping.

When setting wooden fence posts, mix a gallon or two of lime in the soil before replacing it. This will materially check decay.

Alpha Tau Alpha
Three outstanding juniors were recently inducted into Alpha Tau Alpha, the honorary Agricultural Education fraternity. Those boys being initiated were T. E. Garrison, R. L. Bull and J. T. Sherman. They were selected for their scholarship, personal characteristics and leadership ability.

These new members bring the total enrollment to eleven members. C. C. Jackson is president and E. C. Truett is secretary-treasurer of the organization.

New Prof
Dr. D. R. Jenkins has been added to the staff of the School of Agriculture as Assistant Professor of Rural Sociology. Dr. Jenkins is well-suited to his post and has traveled extensively, having lived in New Zealand.

Ag. Ed. Seniors to Rocky Bottom
The Winthrop Home Economics seniors and the Clemson Agricultural Education seniors recently enjoyed a week-end social at Rocky Bottom. The students discussed their common problems, made plans for cooperation between agriculture teachers and home economics teachers and then held a campfire program of stunts, games and dancing. Accompanying the students were the State supervisors and the faculties of the Education departments of Winthrop and Clemson.

It takes about 50 cents worth of rat bait to cover one farmstead. One rat does about $2 worth of damage a year. Anyway you figure, 50 cents spent for bait is a good investment.

Importance of proper barn ventilation is shown by the fact that one cow, for example, will exhale about 10 pounds of water per day.

The Agricultural History Society is working on plans for a national agricultural museum.
AGRICULTURE ON THE MARCH
By E. C. TRUETT, '41

As a subject, agriculture embodies a wide range of scientific information which includes contributions from every science now known to man. As an art, it comprises highly developed skill, challenging problems, and complicated manipulative activities which demand the broadest spread of human abilities.

Agriculture is not a fad nor a new “ism” that has recently appeared on the educational horizon. In fact, it is the oldest, the most discussed, and the most fundamental industry that history has evolved. It has always been, probably always will be, the limiting factor in the development of the moral, social, economic, and religious standard of the human race. Let the farmers lay down their hoes for even one season and the wheels of industry would soon stop, the world's culture would break down, our highly-developed civilization would totter and the world would be thrown into confusion. Men would become ravishing beasts, traditions of art, music, science, and literature would be scattered to the winds. Fortunes would be no more, and the triumphs of science and civilization would fade away as the dew before the morning sun.

It should not be necessary to present any arguments to show why the basic and most fundamental industry of the people in a community should be accorded a place among the subjects for study in the schools of the community. When schools located in agricultural communities fail to provide instruction in agriculture, they fail in one of the fundamental purposes of public school education. When schools were established in the early period of our history, there was little, if any, organized scientific information available in the field of agriculture. The early schools were concerned with so-called three “R’s”. As additional subjects were added, they were selected for their cultural value (not agricultural). This naturally became the accepted policy and so it has been difficult for vocational subjects to break this rather firmly fixed tradition.

Years of cumulative practical experiences, enriched by results from extensive research in the field of agriculture has made available an abundance of content for courses in agriculture. The response has been a rapid increase in the number of high schools where agriculture is included as a subject for instruction and study.

In the early years, little was known about techniques of teaching vocational subjects. Now,

SAVING WITH HIGH ANALYSIS FERTILIZERS
By J. M. COTTINGHAM, '42

For a source of nitrogen in the manufacture of fertilizers several decades ago the fertilizer industry used cheap, bulky materials which contained a small amount of plant nutrients in comparison to the total composition. The analysis of mixed fertilizers was therefore low. A demand developed for some of these source materials in livestock feeding and their price to rise above that which the fertilizer trade could afford to pay.

The chemists of the world were finding new materials which contained up to 65 percent plant nutrients. The fertilizer manufacturers discovered that it was more economical to use the new synthetic high-analysis materials than to mix the low analysis ones on which the price had risen.

The old standby before the fertilizer laws were changed; 8-3-3, continued to be demanded by farmers because of its former reputation. To supply it the fertilizer companies added about four hundred pounds of sand or other filler per ton to bring the new high analysis materials down to 8-3-3. Of course this process needlessly increased the cost of each unit of plant nutrients. The farmer paid the extra expense of buying the filler, getting it to the fertilizer plant, mixing it with the high analysis materials, bagging the increased volume, and transporting the goods to the farm.

The change in the fertilizer laws of the state helped to bring about increased use of high analysis fertilizers. The farmer can make a great saving by applying these high analysis helped to bring about increased use of high-analysis at a lower rate or mixing than to lower analysis on the farm by adding limestone, sand, or dry soil.

increased emphasis is given to the practical application of class room instruction. Through the program of farm practices, the students begin productive work through the special projects and emerge at the end of their years of study with a long-time farm practice program that involves the productive and managerial activities of the entire home farm.

Education in agriculture is not any longer an experiment. Farmers have come to regard it as an investment and the best endowment that they can bestow on their children as safeguards against failure in their future agricultural activities.
Farm Cooperatives for the South

By J. N. FROWEIN, '42

Have you ever stopped to think, just how many cooperatives there are in the United States? There are over 10,500 Cooperatives and almost half of these are located in the South.

Let us first define a Cooperative and see really just what it is composed of and what its duties should be. A Cooperative is a non-profit organization formed by a group of people for some specific purpose. The Cooperative gin of some farm community is a good example of a Cooperative. The characteristics of the Cooperative gin are similar to those of a gin owned by an individual producer which is used to gin his own cotton exclusively. Some features of the Cooperative gin are: (1) ownership by producer-patrons; (2) control by member-patrons; (3) adequate charges and conservative prices maintained. (4) Capital dividends limited; and (5) patronage dividends distributed.

Cooperation is preeminently a farmer activity. Records show that farmers in America have determined the possibilities and limitations of Cooperative selling and buying and that they have evolved techniques for marketing and purchasing that yield benefits to those who participate.

A vigorous rise in Cooperative purchasing by Georgia farmers has taken place since 1930. In 1939 they spent cooperatively for supplies about $800,000, twice the amount of cooperatives purchases reported for 1929 by the Bureau of Census. This growth, while not spectacular, was of character that promises a future for supply Cooperatives in the South.

The success of all Cooperatives depends upon three things: (1) Keeping the objective of the farmers in mind, (2) giving the members an opportunity to cooperate, and (3) synchronizing ownership with patronage.

Nothing is new about this large Cooperative movement in Agriculture. Records show that as far back as 1810 Cooperatives were in practice. For more than 80 years, grain has gone to market cooperatively in the United States. America consumes each year many millions of pounds of beef, pork, and lamb which at some stage of its trip from producer to retailer is handled cooperatively. Even the cows of the country, some 7,000,000 strong, are doing their bit for the cooperative movement—and it's no small bit they contribute. Dairy products associations do a business aggregating $686,000,000 in a year. This figure represents one third of all cooperative marketing done in the United States annually. Selling eggs and poultry by auction, these Coops have proved effective. Coop gins, once found rarely outside Texas and Oklahoma, are gaining a foothold in other states and are increasing faster than any other form of Cooperative in the South. Serving an estimated 60,000 cotton growers, the Cooperative gins are handling nearly 10 percent of all cotton ginned, and are steadily building up their volume. American wool producers are finding the Cooperative way to be the profitable way to send their wool to market. Credit for stimulating national consumer demand for citrus, through wide-spread advertising, goes largely to Cooperatives with farsighted leadership. Apples, grapes, prunes, peaches, pears, cherries, apricots, olives, figs, plums, and nectarines all go to market cooperatively. So do strawberries, cranberries, blueberries, raspberries and many more. Over the Cooperative highway every year there marches a $50,000,000 parade of vegetables. "A" for asparagus, "B" for beets, "C" for celery—all the way through the alphabet to "Y" for yams may be found vegetables going to market through Co-ops. Cooperatives handling nuts are numerous. They do an annual business of $15,800,000.

As long as the farmer raises crops, he must buy supplies such as seed fertilizer and implements. Cooperation was tried and found adaptable to the purchasing of these and many other essentials for farming.

Agriculture in the South looks to Cooperatives for many important services. Providing varied services closely related to marketing and purchasing, Cooperatives have conclusively proved their worth in the Agricultural field.

For Christmas Gifts See . . .

- H O K E S L O A N

M E N ' S W E A R

R. O. T. C. Men Use Your Credit
Important Garden and Truck Crop Insects in South Carolina

By B. R. Wilson, '42

The Asparagus Beetle. The asparagus beetle that we know in this state is a more or less recent introduction having been found in the late 1920's. It is more prevalent on sandy soil, therefore there is more damage done in the coastal section than in the upper piedmont.

In appearance this beetle is about one fourth of an inch in length and is colored red, black, and yellow. The larva is dark grey and its body is soft and wrinkled.

Both larvae and adults do extensive damage to shoots during cutting time. Crooked shoots are the result of the larva gnawing underground. Later in the season larvae and adults defoliate many plants.

This insect overwinters in trash and rubbish. During cutting time it appears and lays eggs. The time required for the eggs to hatch are three to eight days. After developing by a series of molts for 10-14 days it pupates. The beetle soon emerges from the the pupal cell and comes from the ground. There are several broods produced each season.

The best control that has been found is a poison consisting of one part of calcium arsenate and four parts of hydrated lime. It has been recommended leaving occasional shoots to mature and attract the beetle and then spraying thoroughly with the aforementioned poison.

The Mexican Bean Beetle. The Mexican bean beetle is the most important bean insect over most of the state. Only a small area in the southern coastal section is yet uninfested. The beetle is present throughout the state and at times damages beans and cowpeas very seriously.

This bean beetle is a lady beetle having sixteen black spots on its yellow to brown wing covers. The larva is a spiny yellow grub.

The larvae and adults feed on the underside of all kinds of table beans and leaves only the vein network.

Adults hibernate in protected places and they first appear on bean plants during April and May, at which time yellowish eggs are laid in large clusters on the leaves. The yellow larva that hatch, feed and pupate on the plants from which the lemon-colored adults appear. Feeding takes place on the underside of the leaf which makes control difficult.

The best control of this beetle is by insecticides, but it is just as important to destroy crop remnants to prevent further breeding, and to promote vigorous growth so that the leaf area eaten will not be missed by the plant in its fruiting activity.

Research workers of the South Carolina Experiment Station and of the federal government indicate that derris is the most satisfactory material that they have found for the control of this beetle.

When derris is used containing four percent rotenone, one and one-half pounds of the powder is required for a spray to fifty gallons of water. Application of these sprays and dusts should be begun when the beetle is first found in the field. If the beetles are numerous the treatment should be repeated every ten to twelve days.

The Tomato Fruit Worm. This worm is highly variable in color and so very well known that it does not require an extended description.

Caterpillars eat into the fruits and cause them to spoil. Climbing cutworms also produce similar injury.

The tomato fruit worm passes the winter in the pupal stage. Adults or moths emerge during late spring and lay eggs on plants such as tobacco, corn, and later in the season, cotton. Several generations are produced each season. This worm is known as the tobacco bud worm, cotton boll worm and cotton earworm.

The worms are restless and shift from one fruit to another so that one worm may damage several fruits. Studies by the Bureau of Entomology show that a single worm may ruin as many as seven fruits.

To date, poisoned Bordeaux has been found to be one of the most effective spray used. A 4-4-40 Bordeaux mixture with one pound of arsenate of lead was sprayed on the plants, beginning when first fruits appeared.

Picking and destroying infested fruits will aid in reducing damage.
EDISTO FARMS PROGRAM
continued from page 10

Connie, besides having 884 pounds of fat, is still one of the best type cows in the herd. She is now 16 years old and still bringing a calf each year. There is also a full sister to Challenger, Supreme's Connie of Edisto Farms. She is a big cow with a nice udder, good type, and a record of over 700 pounds of fat.

The herd now contains about 155 females all of which are descendents of some of the foundation animals at Langwater Farm, making most of Mr. Guess's herd line bred. He has been line breeding from the beginning, which is a very good practice as his herd has shown gradual improvement in both type and production. This herd is another case which shows that line breeding is the surest way of improving a herd. Mr. Guess has been doing Advanced Register Testing for about ten years. All of his mature cows have records and the heifers are being tested as they freshen with either their first or second calves. They are now milking about 75 cows and getting around 250 gallons of milk per day. Mr. Guess is putting up a new plant in Columbia, where he is already selling his milk. His business has increased over 100 percent each year that he has been in the city.

Mr. Guess thinks his success as a dairyman comes from line breeding the Guernseys and raising all the feed that they consume on the farm. He plants a large acreage of oats, corn, wheat, and oat and vetch hay. In the fall he also plants at least an acre and a quarter of rye and vetch for each cow to graze. These fields are plowed up in May and planted in corn and soybeans for silage. The oat and vetch hay is usually followed by soybeans planted in rows for grazing. Then, too, he has a large acreage of permanent pastures which contain a sod made up of Bermuda grass, Dallis grass, White Dutch clover, and Lespedeza. The small grains are followed by cowpeas or lespedeza, which is cut for hay. Some cotton is still planted on the farm and the seed made into meal for the cattle. All the feed the cattle eat is produced on the farm except Beet Pulp and 20 percent dairy feed which is fed only to the cows on Advanced Registry Test. Mr. Guess's motto is "Better pastures, cheaper milk", and he always tries to have grazing as near the year 'round as possible.

To be good farmers we must think good farming.

SADDLE HORSES
continued from page 11

sprung rib. The quarters are long and the muscles are strong. The feet are of medium size, the hoofs are elastic and the heels spread and well developed. He weighs about 905 to 1,050 pounds. The standard height is 15 to 15 hands, 2 inches. The solid colors, such as bays, blacks, browns and chestnuts are most desirable, although many colors are found.

UNIFORMS

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In the nineteenth century such inventions as the Babcock test for determining the percent of butterfat in milk and the development of various feeding standards began to awaken progressive dairy farmers to the fact that all the cows in their herds were not alike. Indeed, cows differ in production, feed consumption, and percent fat in the milk. Dairymen soon saw the need of some method by which they might check individual cows for either profit or loss. Their solution to this need was found in the formation of organizations that subsequently developed into the Dairy Herd Improvement Associations of today. These associations are composed of groups of dairy farmers interested in improving their herds and obtaining more efficient production.

This progressive movement was launched by Emil Konradi, of Denmark, in 1895. Since that time, the work has spread to thirty-four countries where dairying is an important industry. The dairymen around Konradi's home had been shown the value of testing cows. They tried testing their own cows but found it difficult to add this extra work to their routine duties; consequently they discontinued testing cows. A woman suggested that several dairymen employ a man to do nothing but test. Konradi was then hired as the world's first cow tester.

In the United States the first cow-testing association, now known as Dairy Herd Improvement Association, was organized in 1905 in Newago County, Michigan, but did not begin functioning until January 1906. Since then, similar organizations have become active in every state in the United States.

The first association in South Carolina was formed in 1926 by a group of dairymen in the vicinity of Greenville. This association was active, but the work did not become very extensive until 1934, at which time it became a part of the program of the Extension Department of Clemson College. Dairy Herd Improvement work, under the leadership of C. G. Cushman and his associates, has progressed rapidly in South Carolina. There are now five associations testing a total of 3248 cows in 84 different herds.

An association usually is composed of fifteen to twenty dairy farmers who cooperatively employ a trained test supervisor. He is usually a college graduate who is well trained in dairying. The farmers provide room and board for the supervisor during his stay at the farm, and in addition pay him according to the number of cows he tests. There is a minimum fee of four dollars a day for which the supervisor will test twenty cows. Additional cows are tested at the rate of twenty cents per cow.

The supervisor officially visits each farm once a month. He weighs and records the amount of feed each cow consumes and the amount of milk she produces. In order to maintain accurate records, identification of individual cows is necessary. The supervisor accomplishes this by placing a permanent tag in the ear of each cow. From each cow, the supervisor collects a sample of milk at every milking during one day. He composites these samples and tests for butterfat. With the recorded information, the supervisor calculates the profit or loss from each cow.

Immediately after the recording and calculating is completed, the supervisor shows and explains the records to the farmer and advises him as to how he may make his dairy farming more efficient and more profitable. The dairymen may have cows that are not profitable because of their low production, or he may be exercising unprofitable feeding methods. In either case, the records will reveal the trouble and the
supervisor will suggest a remedy. If the farmer remains with an association and follows the advice of the supervisor, he will usually profit greatly. His profit may come from increased production, or it may come from the sale of animals with D. H. I. A. records. An animal with a record will sell more readily and at a higher price than an animal without a record. Not only will his income increase, but also his herd as a whole will improve. He may also prove sires in his herd with the records of the sire’s offsprings.

This herd improvement work has been very beneficial to dairying in the United States. It has tended to arouse and stimulate a keener interest in the field of dairy farming.

The above chart (taken from “Extension Work in South Carolina—1939) shows the increase in average production that has been brought about by D. H. I. A. testing in South Carolina. Since 1934 approximately ten percent of the cows placed on test in South Carolina have been culled because of poor production records.

No system in cow-testing is perfect. One fault seen in the Dairy Herd Improvement Association is that usually the dairymen who need aid the most are the ones who do not join an association. Of the twenty million cows in the United States, only two percent, or five hundred thousand, are being tested.

There has been a slogan in the South “More Good Cows.”

**THE AMERICAN YOUTH FOUNDATION**

*By Ordway Starnes, ‘42*

We at Clemson are glad to have with us one who has been acclaimed the second most outstanding Agriculture College freshman in North America. This title being awarded by his winning The Danforth American Youth Foundation Scholarship, awarded by William H. Danforth of St. Louis, Missouri. The Danforth Scholarship Committee selects one outstanding freshman from each Agriculture College in North America. These freshmen are awarded half scholarships to camp Miniwanca. They, in turn, compete with each other for a full scholarship. The full scholarship was won by Paul L. Kelley of Kansas State College and Edwin B. Collins of Clemson was chosen as his alternate. Due to the illness of Kelly, Collins was able to take advantage of the full scholarship which paid all expenses, including transportation to Camp Miniwanca.

Camp Miniwanca is located on the shore of Lake Michigan near Shelby and is conducted from August 12-25 for the purpose of establishing principles and habits in outstanding young American citizens which will lead to more balanced living, physically, mentally, socially, morally and religiously. Representatives of the Uptown Kiwanis, F. F. A., 4-H and many others important clubs attended this camp.

The basis on which scholarships are awarded are on work done during high school and their first year of College. Physical, mental, moral, and religious qualifications are considered.

We bow to Edwin Collins, not only because it was truly an honor to win the Danforth Scholarship, but because of the excellent work which he is continuing to do at Clemson.

Heavier tobacco taxes will be no aid to 1940’s heavy tobacco stocks. Although smaller production is expected to offset the record holdings of flue-cured this year, Federal cigarette taxes have been pushed up again. This winter Uncle Sam gets 81 cents per pound on cigarette tobacco. States with cigarette taxes average 25 cents per pound. Average farm price of flue-cured is less than 22 cents per pound.

In 10 years a single head of wheat added 10 million dollars to the wealth of its home state. Pennsylvania No. 44 variety was developed from one head of wheat discovered at the State College in 1909.
LIVESTOCK FOR PERMANENT AGRICULTURE  
continued from page 12

animals but insists on buying ordinary medium grade meat; the kind that can be most easily produced in the South. The greatest handicap to the expansion of livestock production in this region is cheap labor. All classes of animals respond to good care and are handicapped by poor care. Proper care requires good labor. For these reasons livestock will give rich rewards to good management and intelligent planning.

Study and experience are the best ways to learn how to make a profit with livestock. Become acquainted with all the classes of animals, their virtues and short comings. Study your farm and it's location so you can know which is the best type of animal for you to raise. Learn to judge stock, especially meat producers, so you can pick out the good from the inferior. A record of production is more important with dairy cattle than judging. No where can the principal of "make haste slowly" be better applied than in the production of livestock. A man who does not know what he is doing will not stay in the business long, but a little patience will go a long way toward teaching him many of the things he needs to know. There are several principals that no farmer, especially stockmen, can afford to forget. Farm as economically as possible. Pastures are absolutely essential for beef production. Mild winters with year round grazing is Argentina's chief advantage and it is a wonderful pasture country. Southern pastures, and South Carolina are no exception both need liberal applications of lime and superphosphate. Permanent pasture has become the backbone of southern livestock production. Naturally the better the pasture the more economical will be the gains of the animals and the greater the returns from the enterprise. But cattle and sheep will give surprisingly good results even on the poorest land provided enough acreage is supplied per animal. One can not expect animals to get fat on poor pasture, but they will grow and maintain themselves if they are not too old. It will pay any man to make his pasture as productive as possible. Permanent pasture gains are cheap gains and the southern producer is fortunate in having a market that will consume large quantities of the type of animals that can be produced on pasture. If you have limited acreage of rich soil it may pay best to go into the more intensive forms of pro-

AGRI-FACTS  
By E. C. TRUETT

There are about three chickens on farms for each person in the United States.

In order to produce full size apples the ratio of leaves to apples must be about 40 to 1.

From the bottom of the Depression, grains have made the greatest gains in price.

Whey—a by product of cheese factories, is the basis for a new shaving cream.

Broiled hummimgbird's wings would have been about as cheap as the lone peach the Sam Moore family of Sesser, Illinois, ate for breakfast. The peach represented the entire 1940 crop of the Moore's 50 acre peach orchard, which usually produces 10,000 bushels. After $2,200 was spent this year for spraying, pruning, cultivating and other care, one peach was the crop.

Lasting success in farming is achieved by doing the usual things unusually well.

duction such as dairying, pork production, and fat cattle production. Your location and your individual judgment will have to determine which course you will take. There are many acres in the south that can best be put into permanent pasture because of their location, their productivity, or their topography. Permanent pastures will not only conserve and improve these soils, but will yield a profitable return as well.

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GREENVILLE

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Cooperative Frozen Food Lockers

By S. F. PHILLIPS, '42

A comparatively new development is attracting widespread attention throughout the entire nation—that of cooperatives. This new service is the frozen food locker system.

The Farm Credit Administration reports that on Jan. 1, 1940 there were between 2,000 and 2,500 locker plants serving approximately 500,000 families throughout the United States. These locker plants are found as private businesses, cooperatives, and as sideline enterprises of both cooperatives and private concerns. It is estimated that about 15 percent of the total number of plants operating in the United States are cooperatively owned. This development has been most rapid in small towns, and the majority of the patrons have been the farm families and other rural people who live in and around these centers.

There are a few factors which might serve to explain the enthusiastic acceptance of the locker method of preserving the family food supply. The greatest factor is that proper freezing provides more palatable food and eliminates the old drudgery of canning. Furthermore, it is cheaper when compared with retail purchases of meat at the up-town butcher, and in many cases it provides a higher quality meat.

However, in some instances it is inconvenient to have the food supply stored at some distance from the home. This may limit the use of the locker system in more sparsely settled areas, while the cost may be the limiting factor in areas where the farm income is low. The latter condition offers a challenge to cooperatives, for it is in these areas that cost and charges should be kept at a minimum.

Before going further, let us consider a few advantages and disadvantages of the locker system. Some of the factors which appeal to farmers are:

1. Locker storage permits the farmer to butcher at any season of the year, since immediate cooling under controlled temperatures is possible.
2. There is less spoilage under controlled temperatures than on the farm.
3. The locker plants usually employ an experienced meat cutter; hence you get better utilization of the carcass.
4. The quality of cured and smoked meats by an expert butcher usually is superior to that of farm-cured meats.
5. A more balanced diet is possible through the storage of meats during seasons when it is impossible to keep it on the farm.

Advantages of a cooperatively owned locker plant: A cooperative should be more able to plan and build a plant to fit the need and desires of the community with less fear of competition which may result in a high operating cost. Cooperatives are in a better position to teach farmers the possibilities an uses of the locker service. The member patrons take a greater interest in the problems and management of the plant since they are part owners of the concern.

Some disadvantages of the locker plant are:

1. The necessity of making a trip to the locker every three or four days for meat or other food products stored in it. This is even more true where the patron does not find it necessary to make a trip to town once or twice a week on other business matters.
2. Meat must be used very soon after being taken from the locker. Many farmers renting lockers have a small unit installed in the home to hold several days' food supply.
3. Lack of wide variety of meat products as when purchased are secured from the up-town butcher.

The real need for a locker plant should be realized by the majority of the farmers in a community or trading center. Once the need has been determined, hold several local meetings to explain the possibilities and limitations of the service to be rendered by the cooperative. A committee of 7 or 9 individuals is elected to start a membership drive. It is necessary to estimate the potential patronage in order to form a basis for the size and location of the plant.

Survey the town or community for a possible building site. The plant should not be located too far from the trading center, but should be located so as to provide ample parking space for the patrons. It should have access to sewer, water, and electric connections.

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Year-Round Pasture

By L. C. HAMMOND, '42

Pastures of South Carolina are now receiving much attention as the South is in many ways adapted to livestock production. It has a mild climate, an abundance of rainfall and has soils to which many pasture plants are well adapted. In the early days, the South was the best cattle country in the New World. However, with the invention of the cotton gin and the resulting expansion of cotton growing, cattle grazing was rapidly pushed to other areas.

The production of cotton has brought the Southern farmer to face many problems. It has resulted in the depletion of the soil's fertility and its loss by erosion. Much land on which cotton could no longer be grown profitably has been turned out and because of its low fertility has not produced native plants in great enough abundance to control erosion. It is such sub-marginal land in the South that is fenced and used for pasture. This land should be treated as a sick patient and receive the attention of everyone. Pasture land properly managed offers a direct aid.

Since the South no longer has a foreign market for its cotton there must be some other source of income. Adjustment of supply to demand can be accomplished by returning to pasture land that should never have been cultivated. However, after realizing the need for pastures and the benefit to be derived from their use, we are confronted with this question—can pastures be made to supply grazing for livestock the greater part of the year? We find that it is possible.

To provide pasturage throughout the year, permanent and temporary pastures must be used. Let us first consider the permanent pasture.

A permanent pasture is grazing land seeded with perennial pasture plants or self-seeding annuals, or both, which is not plowed or cultivated over a long period of time. A desirable permanent pasture contains both grasses and legumes. A good pasture mixture recommended for South Carolina consists of Bermuda, Dallas, and Carpet grass and White Dutch Clover, Hop Clover and Lespedeza.

Bermuda grass is a perennial, turf-forming plant of high palatability and is very nutritious. It grows well alone or in mixtures and can be grazed from late spring to early fall.

Dallas grass is a perennial bunch grass, best adapted to moist bottom land and withstands grazing better in mixtures. It is grazed from early spring to late fall.

Carpet grass is a perennial adapted to the Coastal Plains. It can be grazed from spring to fall but will not withstand severe freezing.

The Clovers and Lespedezas are very advantageous in a pasture mixture. They balance the ration and maintain the nitrogen content of the soil, thus reducing the need of nitrogen fertilizers.

Permanent pastures, if properly managed, will supply adequate grazing from early spring to late fall, except for a period during the summer when there is apt to be a lack of moisture. At this time a temporary pasture must be used.

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In caring for a pasture it must be terraced and contour furrowed to conserve moisture, seed, and fertilizer elements and to prevent erosion of the soil. A pasture is a good recommendation for use in soil conservation.

Also, strict attention must be paid to the low fertility of the average Southern pasture. The basic treatment for a pasture is lime and phosphorous. Apply one ton of lime per acre every four or five years and 300 pounds of super-phosphate the first year with 200 pounds per acre the following 3 years. Each year a complete fertilizer of 4-12-4 or 5-10-5 analysis applied at the rate of four to six hundred pounds per acre is generally recommended on poor soils.

Also strict attention must be paid to the grazing of the pasture, as either over or under grazing will materially affect the maximum returns obtained.

The productivity of the permanent pasture will be low during the winter and during the hot, dry season of the summer. At these seasons the temporary pasture is brought into use. A temporary pasture is a field used for grazing when the permanent pasture is unproductive and does not supply the proper amount of food for the animals kept on the farm. Kudzu is a legume well adapted to this purpose. Cowpeas, soybeans, and stubbles from small grains offer pasture during the summer. Velvet beans are well adapted to fall and winter grazing. Barley, oats, wheat, vetch and winter peas can be used for winter grazing.

If such a system of proper management of permanent pastures and their being supplemented with temporary pastures is utilized, grazing can be carried on practically the entire year. Thus, in South Carolina, there is an opportunity for a new source of income, a system of soil conservation and for the maintenance of a diversified system of agriculture.
barnyard where the temptation is not so great as is the case when the pasture fence is near some attractive feed. This training should be done by placing a piece of barbed wire, about twenty or thirty feet in length, across the corner of the barnyard beyond which is placed feed. If the wire is attached to the controller, the animals will be shocked when they contact the energized wire. They soon realize that they get the shock by touching the wire, and after a few attempts to pass the barrier, they become trained. In the case of horses and cattle, usually fifteen minutes to one-half hour is required to complete the training. In the case of hogs and sheep this training period may take some additional time. After being properly trained, the animals may be turned out into the field where they will approach the wire with caution and respect, and will no longer attempt to break out.

Over 800,000 Southern farm families have no vitamin factories in the form of vegetables gardens.
TERRACING FOR SOIL & WATER
continued from page 3

Type of erosion generally begins in depression or draws. Sheet erosion is not so noticeable as gullying, and for that reason many farmers do not consider it very harmful. However, it is very destructive since it robs the land of the surface soil, which is known to contain a higher percentage of plant food than does the subsoil.

Erosion is caused largely by the rapid movement of rain water over the surface of the ground. Therefore, methods of preventing erosion must be directed toward causing the water either to sink into the soil or to flow slowly over the surface to a draining channel.

Soil erosion may be defined as the loosening and removal of soil from its resting place by the action of water and wind. The two main classes of erosion from the action of water are sheet erosion and gully erosion. Terracing is a valuable prevention of both types of water erosion and, as a conservator of moisture, it directly aids in the control of wind erosion. Terraces form intercepting channels that break long slopes and thereby provide low-velocity surface drainage, which reduces the amount of topsoil that can be carried down the slope or from the field by surface run-off. When placed on the contour, terraces retain much more of the run-off on the field, and so conserve water.

The Mangrum terrace consists of a broad ridge of earth thrown up across the hillside and having a grade in the direction of its length. In throwing up this ridge a broad, shallow channel is formed along its upperside, through which the collected water flows at low velocity to the outlet channels at its ends. The entire terrace is cultivated.

The top of the Mangrum terrace should be from 15 to 24 inches higher than the bottom of the channel on the uphill side of the terrace. The terrace should be built ordinarily from 15 to 30 feet wide at the base, depending upon the slope of the land. Wide terraces are the more desirable from the standpoint of crossing them with farm machinery. The width may be increased each year by throwing the soil to the center of the terrace in plowing until, on moderate slopes, the lower edge of one terrace meets the upper edge of the next terrace below, and the whole field, as often happens, becomes a series of terraces. To prevent washing in the channel, the grade of the terrace should be not greater than 6 inches in 100 feet.

In general, 1,600 to 1,800 feet is the maximum distance that a terrace should drain water in one direction. When a few terraces in a system must exceed the maximum lengths recommended they are handled most satisfactorily by draining the excess length to a convenient natural or vegetated outlet.

The provision of suitable outlets for the removal of surface water at the ends of graded terraces is often the biggest problem in terracing work. Natural water courses make ideal outlets. Sometimes it is found necessary to use a natural drain in a field as a terrace outlet. Where this is done the draw should either be seeded to grass or by some other means prevent the erosion of a deep gulley. Mechanically constructed outlets and channels are very simply constructed. They may be made of concrete check dams, check dams of Bermuda sod, or planted in kudzu.

The three main requirements of satisfactory terrace cross sections are (1) ample channel capacity; (2) channel and ridge slopes flat enough to permit the operation of farm machinery along the terrace without undue breaking down of the terrace or hindrance to tillage operations; and (3) economic cost of terrace construction. Small blade terracers, scrapers, V-drags, and plows, pulled by farm tractors, horses, or mules have been used for the construction of a large part of the terraces in the United States today.

It is advisable to start controlling erosion on virgin land when it is first broken rather than waiting until the land has become badly eroded and unproductive.
THE ENTOMOLOGIST AND THE LIVE-AT-HOME PROGRAM

continued from page 4

insecticides in large quantities at relatively smaller costs, the “live at home” program necessitates buying a large number of insecticides in smaller quantities and therefore relatively higher costs. If this increase in cost is prohibitive for the “live at home” farmer, the entomologist may be forced to devise an entirely new control.

From the insects point of view it might be said that as the entomologist goes, so goes the farmer.
A.S.A.E. Industry Seminar Trip for 1940

By T. V. WILSON, '42

Every summer for the past few years several farm machinery companies have jointly sponsored an educational trip for a group of instructors and students from nearly every state college in the United States, and a few representatives from foreign countries. This year the eight following companies participated in bearing the expense of the seminar trip: John Deere Plow Works, Minneapolis-Moline Power Implement Company, Caterpillar Tractor Works, International Harvester Company, J. I. Case and Company, and Alis-Chalmers & Company. This year the seminar group was larger than any group before, and the trip also lasted longer than in preceding years. A total number of one hundred and sixteen men present—one hundred and twelve from the U. S., one from Mexico, one from Canada, and two from Brazil. In order for the group to have more time to spend with each company arrangements were made to do all the travelling at night; thereby, giving a full day for each company.

The trip lasted eight days; one day for each participating company. As a usual thing about half of each day was spent looking through the factories, and the other half was taken up by different factory representatives lecturing on subjects of interest.

The more interesting of the two things mentioned above was the factory inspection trips. To one who has never seen anything like it before, it is really worthwhile to see machine parts made from raw material, processed, and finally combined to make one machine that is frequently capable of doing the work of several men. In the process of making these machine parts, all the factories employ the same general principle; however, in some respects they are different. For instance, some of them have more modern or up-to-date machinery to work with; others seem to have cleaner, better conditions to work under, etc. One thing every company seemed to put special emphasis on was the heat treatment of materials. Nearly every part of every machine has to have some specific quality in order to serve its part on the machine. After selecting the right type of material, it must undergo a certain amount of heat treatment to give it the quality needed.

Another important phase in making machine parts is the foundry. It is one of the basic departments in making machine parts for the simple reason that without molds and cores in which to pour the melted iron the parts couldn't be made. No factory would be complete without a good foundry.

The assembly line for tractors was the most interesting of all factory departments. It was hardly believable to start at one end of the assembly line with nothing but a frame and walk along as they part by part was added until the tractor was completed, painted, dried, and taken off the assembly line. Three of the factories made track-type tractors. After these tractors were completely assembled, they were fastened securely and run in large pans of oil. The idea for doing this was to break in the tractors.

In all the factories the manual labor of the workers was reduced to a minimum. To move large bulky products from place to place in the same building, large overhead cranes were used. They could be moved in any direction by the operator who sat in a small housed in portion on the frame of the crane, also, for moving metallic substances such as scrap iron, large cranes were equipped with a magnet instead of hooks. For hauling small objects in large quantities, small transport trucks were used. They were just flat-body affairs with tractor motors in them. In some of the factories there were small flat body cars that ran on tracks. They were usually pushed by the transport trucks described above. Other labor saving devices were electrical lifting devices and electrically operated wrenches.

Another very amazing thing to watch was the large machines used in making bolts, pistons, connecting rods, crank shafts, and many other things. The operator merely put in the stock and removed the finished product.

After going through these factories one can easily see why the designs of tractors and other machinery are not changed much from year to year. It is nearly impossible because there would be so many complicated machines to rebuild, thus resulting into a big loss of time and money.

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COOPERATIVE FROZEN FOOD LOCKERS
continued from page 25

Select or elect a committee to visit and examine several plants which are operating successfully. This committee should gather information on building costs, operating costs, upkeep, and the methods of serving patrons.

Estimate the complete costs of the plant, the amount of money which can be borrowed from a cooperative bank, and hence the amount which it will be necessary to secure from stockholders. From 40 to 60 percent of the amount needed for building should be collected from stockholders.

Plant arrangement of the proposed building should be given thorough consideration. Plan for future expansion rather than overbuild in the beginning. Install good insulation. Skimping on insulation is false economy, but remember that a high price does not necessarily mean a good installation. Provide the type of floors and facilities that can be cleaned easily and thoroughly. So arrange the processing machinery to avoid "back tracking" in handling meats.

These foregoing points should be kept in mind in building a locker plant.

A frozen food locker plant, properly built and operated may do much toward improving the diet of farm families. Cooperatives will render a real service to farmers generally if they are in a position to set a pace in this new and fast-growing development.

A.S.A.E. INDUSTRY SEMINAR TRIP FOR 1940
continued from page 31

It would also cut down on the production which would result in another loss, because they can hardly produce enough machinery now to meet the farmers demand.

Another thing that is very important in any factory is an organization of workers. In most of the factories we visited the workers had some type of organization. They held regular meetings and discussed things they thought would help them in their daily work. All of them also had athletic teams and made arrangements for social gatherings in order to get better acquainted with each other. These are things that give workers a better working spirit. They didn't seem to mind working as much as those workers who had no organization.

In addition to these factory inspection trips, different company representatives gave some interesting talks discussing different subjects of interest, and still stayed in the farm machinery line. Some of them explained different things in their factories, some talked about factory organization and some about everything in general.
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Back in the middle 1830's a village blacksmith in central Illinois dreamed his dream—a plow that would scour in the prairie soils of the opening West.

It was just a dream until that early spring morning in 1837 when John Deere turned his dream into a reality and laid the foundation of the great organization that bears his name today.

With John Deere, as with every man or woman who leaves an impress on the pages of history, success followed the ability to turn the gossamer of a dream into the granite of achievement.

John Deere, Moline, Illinois