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Clemson University

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He’s an American farmer, fighting the battle of food.

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Electricity is one of his most important weapons.

Electricity means more production with the same amount of work. Electricity means more time for productive effort. Electricity means more efficiency, more economy, greater comfort, better health. Electricity is one of the reasons why American agriculture, like American industry, will out-produce the world.

Electricity can help in the big job of food production that lies ahead of you. Now is the time to find out how to use it most wisely—and profitably, how to make it the greatest possible help to you and to the country.

And, when you look to electricity, look to Westinghouse—the name that stands for the highest development of all the good things that electricity makes possible.

AGRICULTURE: WEAPON OF VICTORY

America must and will win the battle of food. To the young men preparing to wage this all-important battle—today’s students in American agricultural colleges—Westinghouse pledges its fullest cooperation.
IN THIS ISSUE

Plan Now—A Post War Agricultural Program—M. E. Abrams .......................... 3
The Agrarian Ex-Administrators ........................................ 4-5
The Value of Forage Crops In the Production of Hogs—T. C. Moss ............... 6
The Clemson College Dairy Plant—E. B. Collins ................................... 7
Blueberries As a Fruit Crop For the South—C. K. Stuart ......................... 8
Engineering As Applied to Agriculture—St. Clair Knight ......................... 9
History of the Department of Agriculture—J. L. Schaffer ......................... 10
Farm Timber and National Defense—D. C. Eaddy, Jr ................................ 11
Between the Furrows .................................................. 12-13
The Agrarian Presents Ben E. Goodale .................................... 14-15
City Looks At the Farm—J. L. Schaffer ................................... 16
Theory for Agriculture—M. O. Berry ..................................... 17
Experimental Facilities .................................................. 18
Experimental Activities ................................................................ 19
Gone With the River—E. P. Huguenin ......................................... 20
About This and That—The Editors ........................................ 21
14 Points for Victory—Percy H ........................................... 22

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CLEMSON COLLEGE  SOUTH CAROLINA
PLAN NOW...
A Post War Agricultural Program

Guest Editorial — By M. E. Abrams, State Senator

The southern farmer has until the outbreak of the present war, depended upon foreign markets to take care of his surpluses of farm products. But now that the last foreign buyer has been eliminated and he has no foreign market in which to unload his surplus, he will have to learn to take care of himself and find other sources of income and new uses for the things he grows.

Already some, who are farsighted and are thoughtful are beginning to inquire and to ask what is most likely to happen to agriculture when the war is over? When our farmers are harnessed to full production, what are we going to do with the surpluses of wheat, of cotton, of tobacco, etc., that have piled up in our warehouses during the post war period?

How are we going to keep our industries producing at full capacity and employ our industrial workers so they can buy the goods our farmers produce?

Not only must America plan to win this war but she must plan to avoid a recurrence of internal depression and find ways and means of preventing unemployment at the conclusion of the war. She must provide for the distribution of farm products so that her bread winners will not be forced to go hungry and roam the country seeking employment like they were compelled to do after World War number one.

Another inquiry some are making: can the southern farmer compete with his South American neighbors in the production and cost of farm products? Can he who pays a high scale of wages and provides a decent standard of living compete with his neighbor who does not pay a living wage and does not maintain a high standard of living? Can he sell in a foreign market when his costs are much higher than his competitors? Yes, he can provide he grows a better product and increases his yield to such an extent that the cost can be greatly reduced.

While the war does furnish a money making opportunity and for once the southern farmer seems to be lucky he should nevertheless not depend entirely upon crop farming but should supplement his farm income by raising livestock and finding other sources of income.

He should grow wiser from past experience and not put all of his money and energy in the production of one crop, but should engage in other industries that are profitable. Let him grow a good type of beef cattle and have a few hogs for sale so as to help out the farm income. Improve and sod the pasture so that the cost of growing the extra beef cattle can be kept to a minimum.

Now as in the past the chief cause for the unsuccessful growing of livestock is lack of home grown feed due primarily to poor soils brought about by a system of farming not conducive to soil building and soil conservation. Permanent pasture is necessary in any system of profitable stock development. More livestock, more poultry and more dairying to offset our sole dependence on crop farming, will not only make up for our lost cotton and tobacco markets, but will also provide a twelve months income producing period which enables the man on the farm to enjoy modern standards of living.

"The only real hope for the farmer in the heart of the agricultural South and West," said Walter W. Liggett in Scribners several years ago, "is the establishment of packing plants, canneries, cooperative creameries, factories to make paper and fiber boards and distillers to render industrial alcohol from waste farm products, so that the sons and daughters of farmers may have gainful employment close to their homes and also be available for work on the farm during the height of the seasonal activity."

The prospects for increased income to the southern landowner from the growing and sale of well protected and well managed tracts of timber are very promising. Where care and attention is given to the cutting of the trees so as to leave stands of growing timber on the land and where due caution is practiced in the keeping of fire out of the woods very substantial profits are realized. During the winter months spare time can be spent very profitably in the thinning of the timber to a stand and otherwise, protecting same, for the growing of good timber pays and pays well. Someone has said that neglect of the forests costs the American farmer over a hundred million dollars a year.

"When it isn't raining the famous Arkansaw Traveler could not be interested in patching his roof because he didn't need it and in rainy weather he couldn't get out of the house long enough to do it. So the roof was never patched."

But when it comes to sound planning to keep our industrial workers employed and the produce of our farms from piling up in huge surpluses it will be a tragedy indeed if agriculture becomes complacent and neglects to provide for the post war period.
EDWARD P. HUGUENIN
"Deacon"
Editor-in-Chief

Rising Executive Staff

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<thead>
<tr>
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THE VALUE OF FORAGE CROPS IN
THE PRODUCTION OF HOGS

By T. C. Moss, ’43

It is a matter of common observation that pigs do better when given access to green feed than when confined to a dry lot. Strictly speaking, the pig is not a grass-eating animal, but he, nevertheless, is able to consume an amount of forage which may contribute materially to his support.

Our cereal grains are deficient in some of the essential proteins as well as being deficient in a sufficient amount of proteins. Also, our cereal grains are lacking in vitamins A and D and quite frequently minerals, especially calcium and common salt. Here is where forage crops are most important, for they not only tend to act as a part protein and mineral supplement but they are also rich in vitamins.

Investigations by Woodman and Norman of the Institute of Animal Nutrition, Cambridge, showed that pigs from 150 to 195 pounds in weight which received 68 per cent of a full meal ration ate 4.4 pounds of cut grass daily. Eighty-five per cent of the dry matter of the meal was digested and 60 to 62 per cent of the grass. The conclusion was drawn that one pound of mixed meal is equivalent to 6.3 pounds of fresh green pasture.

There has been quite a lot of discussion on the subject of dry lot versus forage feeding. The following information is taken from PORK PRODUCTION by Smith:

**Dry Lot Versus Forage Feeding**
(Average 25 Experiment, 17 pigs to Acre)

<table>
<thead>
<tr>
<th></th>
<th>Average Daily Gain</th>
<th>Concentrates to Produce 100 Pounds Gain</th>
<th>Concentrates Saved per Acre of Forage</th>
<th>Amount of Pork Acredited 1 acre of Forage</th>
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</thead>
<tbody>
<tr>
<td>Dry lot</td>
<td>lb. 1.106</td>
<td>lb. 404</td>
<td>lb. 1,147</td>
<td>lb. 284</td>
</tr>
<tr>
<td>Forage</td>
<td>1.355</td>
<td>356</td>
<td>1,147</td>
<td>284</td>
</tr>
</tbody>
</table>

The above information was gathered by Smith from experiment station data. The trials in each case began soon after the pigs were weaned and continued until they had reached approximate market weights which represented, on the average, a period of 106 days. Rape was the forage used in six trials, red clover in four, timothy in three, alfalfa in ten, a mixture of rape and oats in one and soybeans in one. Only those experiments were considered in which practically full and well-balanced grain rations were fed in both lots. The amount of the protein supplement allowed in the forage lot was usually less than the amount fed in the dry lot. The ration most commonly fed was corn and tankage.

Although the pigs in the dry lot were fed rations which were fairly well-balanced according to standards, those having access to forage made an extra daily gain of one-fourth of a pound, on the average; in some cases the difference in the rate of gain was greater than this, and in others it was less. None of the hogs in the dry lot gained as rapidly as those on forage. At the end of the feeding period, the forage feed pigs were, on the average, 27 pounds heavier.

Mr. Godby of the South Carolina Experiment Station grazed spring pigs on soybean forage at the rate of 12 pigs per acre during each of four years. They were turned in when the plants were about eighteen inches tall; the pigs weighed fifty pounds. They were grazed for a period of 106 days, on the average, and weighed 200 pounds when the trials closed. The ration fed was a full-fed of corn and a half feed of tankage. By comparing the results with those obtained by comparable groups of pigs fed by the same ration in dry lots, it was calculated that an acre of beans saved 1,184 pounds of feed (corn and tankage) or should be given credit for producing 376 pounds of pork per acre. It has frequently been stated here that soybeans are the best summer and fall forage crop for South Carolina.

A summary of the benefits from growing forage are as follows: pigs on forage make faster gains

Continued on Page 22
THE CLEMSON COLLEGE DAIRY PLANT

EDWIN B. COLLINS, '43

Editor's Note: The entire layout of the dairy plant is on the front cover.

The Clemson College dairy barn is located one-half mile southeast of the Clemson College main building. The one story building, surrounded by permanent pastures, is made of glazed tile with steel trusses. Before the United States entered the present war, a competent engineer estimated the dairy plant at a value of $80,000. At the same time the herd of Holstein, Guernsey, and Jersey cattle was valued at $38,000.

In the herd there are 332 female animals and two bulls of each of the three major breeds of dairy cattle. At present, the 171 milking cows are averaging 30 lbs. of milk each day. The Holsteins average 38 lbs., the Guernseys average 24 lbs., and the Jerseys average 23 lbs. of milk per day. The daily herd production is approximately 600 gallons. Three hundred and fifty gallons of this milk is used each day during the school term by the college mess hall. The remainder of the milk is used in the college creamery for student laboratory work, dairy products research, and retail sales. During the summer months the milk has been largely sold in the form of ice cream at the roadside market and the creamery. Any surplus has been disposed of through ice cream companies. During the summer of 1941, Fort Jackson received a considerable quantity of milk from Clemson, and it is likely that this will be repeated this year.

The original dairy barn, which was constructed in 1911, burned in February, 1935. During the summer of the same year, the barn which now stands was completed, situated on the same site as the old building. Since the original foundation, water system, sewer, and calf barns could be reused, and since 1935 was a very economical year for obtaining building material, the new barn, milking parlor, and equipment cost only $43,000. Since Clemson is a permanent institution for teaching and research work, the new barn was built with that fact in mind. Though the barn is made of tile and steel, the same plans can be easily used in building barns with many different and less expensive materials. A dairy barn is a farm factory in which the home grown feeds represent the raw materials to be converted into human food by the dairy cow, which represents the machinery of this factory. Recognizing this fact, milking parlor, vacuum pumps, motors, feed grinder, and many other labor saving devices were used in equipping the Clemson plant, so that it can be operated on a semi-industrial basis with as little hand labor and drudgery as possible. There are 29 electric motors used in operation ranging from a 30 horsepower motor, which drives the feed grinder, down to a 1-8 horsepower clipping machine.

Many research projects are carried on by the dairy department. Some of these are artificial insinimation, physiology of the dairy calf in relation to the consumption of milk, control of digestive disturbances of calves being fed on milk, cross-breeding to determine hybrid vigor and other interactions of genes in the hybrid, permanent pasture study, types of winter roughages best suited to this region, blue mold cheese, and the effect of various southern feeds upon the chemical and physical properties of milk produced.

A graduate of the University of Kentucky, Prof. J. P. LaMaster is head of the Clemson College dairy department. While Prof. LaMaster was in the University of Kentucky he was a member of a judging team which won first place in a judging contest at a National Dairy Cattle Show in Chicago, Illinois. At one time Prof. LaMaster was bacteriologist and assistant superintendent of Elmendorf Farm, a certified milk farm of 400 cows near Lexington, Kentucky. Immediately prior to his coming to Clemson, Prof. LaMaster was with the U. S. Department of Agriculture doing dairy cattle extension work in Washington, D. C. Other members of the dairy department's staff are: Prof. B. E. Goodale, associate professor of dairying, Dr. G. H. Wise and Dr. P. G. Miller, associate dairymen on the experiment station staff. Dr. C. W. Anderson does research work in animal pathology with the dairy, animal husbandry, and poultry departments.

The Clemson dairy department has become one of the most outstanding in the southern states, and it is continually bringing more emphasis upon the growing importance of dairying in this region.
Blueberries As A Fruit Crop For The South
By C. K. Stuart, '43

Blueberries serve as a very good fresh fruit and are also excellent for cooking.

Pioneer work on blueberries was done by Dr. F. V. Coville the United States Department of Agriculture around 1920. About the same time Miss Elizabeth White of Whitesbog, New Jersey also did some very interesting work on selection of outstanding wild plants. Most of Dr. Coville’s work was done on the culture of blueberries. In his work, Dr. Coville used the northern bush type. He discovered that blueberries do well on very acid soils having a pH. of 4.4-5.1. This discovery was of very great importance because it opened a field for crop thriving on acid soils.

Breeding and selection work is being carried on in a number of states including New Jersey, Michigan, Mass., and also by the United States Department of Agriculture. At the present time workers of the United States Department of Agriculture are attempting to develop types that are adaptable to the Southeast. Their work as present includes the crossing of many northern bush varieties with selection from the southern states, an attempt to develop a variety of high quality that will be adaptable to the southern states.

The chief objection to the southern varieties of blueberries is that they do not possess the high quality that the northern varieties possess. Other objections to most of the southern varieties are that some have large seeds, some have a glossy black color instead of the desirable light blue color and some varieties are very difficult to pick as the berry tears when picked. Even some of the berries contain grit cells, which is a very undesirable characteristic; on the other hand, many plants produce large well colored berries containing small seeds and possessing fair picking qualities. These types of berries may be used in breeding work with the aim of combining these desirable characteristics with the excellent flavor of some of the northern types. This work should produce berries that are adaptable to the South and in addition have the desirable qualities that are found with many of the northern varieties. Many wild varieties of blueberries grow in the south. Many of these wild varieties are being tested with the aim of finding a wild plant possessing many desirable characteristics.

The main reason the North has more desirable characteristics than the South is due to the fact that the breeding and selection work has been carried on in the North since around 1920. Breeding and selection work on blueberries is relatively new for the South, as little work has been done on this berry until the last few years.

At the present time Dr. George M. Darrow of the United States Department of Agriculture is doing considerable work on the southern type blueberry. Several selection have been made on the southern type including such varieties as Myers, Hagood, Long, West Florida, and Black Giant, which are being propagated for more extensive planting.

The northern high bush type is grown commercially in parts of North Carolina, New Jersey, Mich., Mass. and some states farther north. The chief requirements for the northern type are an acid soil and a water table 16 inches below the surface during at least a part of the growing season. It is very difficult to grow this type in this section because of water requirements. It is hoped, however, that this difficulty can be surmounted by mulching with materials as saw dust, leaves, straw, or pine needles.

The southern type is more resistant to drought, consequently may be grown on drier soils than the northern type. The southern type is well adapted to many of the garden soils of the south. The pH. of much of the southern soils is ideal for the growing of blueberries. Most of the southern soils have a fair water supply which is sufficient to meet the needs of the southern type.

With the increasing interest in Victory gardens, there has been an increased interest in blueberries as an addition to the home garden. The northern type may find a place in some localities of the south, but generally conditions in most gardens are not conducive to its growth. Tests are being carried on at Clemson and other southern institutions in an attempt to find desirable varieties on the eastern markets.

The northern varieties sell for $0.20 to $0.50 per quart.

The rabbit-eye type of blueberries are grown quite extensively in parts of the South. There are very large plantings of this type in parts of Florida, and some few are grown in Georgia. This type of berry has been tried in South Carolina with considerable success. Some varieties of the rabbit-eye type are grown in south Georgia, but the low bush type seems to thrive best in western Georgia. The coastal section around Wilmington, N. C., is assuming importance as a producer of the northern high bush type.

As a food blueberries are excellent. They serve as a very good fresh fruit and are also excellent for cooking. They are also well adapted to canning and quick freezing.
Engineering As Applied To Agriculture
By St. Clair Knight, '43

Engineering goes hand-in-hand with agriculture in mechanization.

The sciences of agriculture and engineering are rapidly being correlated and fused for the betterment and advancement of the farmer. Farming has, year by year, become more mechanized. The great necessity for further and improved mechanization has now presented itself due to the seriousness of the world situation.

The successful farm business must be efficient. Exactness and accuracy are not only desired but demanded. The engineer must be exact, accurate, and efficient. The business of farming being the largest and most important business on earth, must necessarily comply with these demands.

Recognizing the importance of following the practice and principles advocated by the agriculturist, there are four other fields in which engineering takes place. Great stress is placed on correlating these fields with sound agricultural principles. A knowledge of them, (1) Rural electrification, (2) Design of farm structures, (3) Soil conservation, (4) Motors and power machinery will lead to a really successful farm business.

With the creation of the R. E. A., new importance has been attached to the value of electricity on the farm. It is generally conceded that no profit can be realized by using electricity only for lighting the home. This can and will increase labor efficiency and reduce the amount of physical labor required in all farm operations. All this is accomplished by the simple electric motor. Yet it is not as simply done as it may seem. Motors are designed for different jobs.

The load that is to be pulled must be carefully determined and the proper horse power of the motor can then be selected. The windings must be different on motors that pull varying loads than those that carry constant loads. It may be necessary to have a speed control rheostat in order to obtain the desired R. P. M. As can be seen, a working knowledge of the mechanics of motors is necessary in selecting the most efficient and economical one for the job that is to be done. Electricity is also proving its place as a head medium for hot beds. Here it is essential to understand wiring and the operation of thermostats.

The importance of farm structures in the development of farm business is being widely recognized. It used to be so a farmer, if he needed a building, would just decide that he'd better put up something that would be called a barn. The economic soundness of this policy has now been displaced. Any structure should be planned to suit the various needs that it may be called upon to satisfy. In order to do this, a thorough knowledge of materials of construction must be known. The size must be carefully calculated for economic soundness. A sensible system of yearly repair must then be incorporated into the farming program to preserve these buildings. Proper maintenance will result in longer life and a decrease in the total yearly cost.

Soil conservation deals with the preservation of that most important natural resource, the top soil.

Continued on Page 24
History Of The Department Of Agriculture
By J. L. Schaffer, '43

There were proposals as far back as the year 1776 that a Department of Agriculture be formed. George Washington, in his last annual message to the Congress said that a board of agriculture should be formed to collect and diffuse information and "by premiums and small pecuniary aids to encourage and assist a spirit of discovery and improvement". In the year of 1839 Congress appropriated $1000 to collect agricultural statistics, conduct investigations, and to distribute seeds. It was with this money that the Agriculture Division of the Patent Office was organized. In 1860 the Republican Party was indebted to the west for its victory. President Lincoln called for the establishment of a agricultural and statistical bureau in his first message to Congress.

The Department of Agriculture was created on May 15, 1862. It did not at that time have a cabinet status. The first head of this department was Isaac Newton. In 1867 a museum was started and in 1881 a building was erected for that purpose. The first Division organized was the Chemistry Division which dealt with soils and fertilizers. It was set up in 1862. Next came the Entomology Division. It directed its efforts to combat insects that were injurious to agriculture. The Bureau of Animal Husbandry was set up in 1884 to save our meat export trade. At that time, many animals that were exported were diseased, and we realized unless something was done to stop this practice our market would be lost.

Land Grant Colleges were established as a result of the Morrill Act of 1862, and this has facilitated the dissemination of stores of Agricultural information. The first State agricultural experiment station was organized at Wesleyan University in Middletown, Conn., in 1875. In 1887, the Hatch Bill authorized a national system of agricultural experimentation. It was the first time in history that any nation had taken such a far sighted step.

In the year 1889, the Department of Agriculture was given a cabinet status. At the turn of the century, the home demonstration work was begun. In 1914 the Smith-Lever Act was passed which Congress offered to match State grants for extension work. In 1905, the Department assumed protection of our national forests, and a year later took over the enforcement of the Pure Food and Drugs Act.

The Smith-Hughes Vocational Educational act of 1917 provided for work in that field until to-day where it has taken on a major importance in teaching farmers the innumerable things they have to be acquainted with to make their enterprise successful.

On May 15 of this year we celebrate the eightieth anniversary of the founding of the Department of Agriculture. If we look back, we can see a job well done. In so short a period, it is remarkable that they could have done so much for the farmer. The countless thousands of bulletins, reports, statistical data, pamphlets they have issued have been invaluable to the farmer of this country, as well as the rest of the world. They have met every problem squarely and have usually solved it as best as could be expected. This Department is almost completely free of politics. The majority of its members are energetic and conscientious workers who are seeking to better the lot of the farmers of our nation. Let us pause and salute the past and the present members, and let us all hope that the future of The Department of Agriculture will be as bright as the past. With such an excellent man as Claude Wickard at its helm, we need have little fears of its immediate future.

DR. COOPER AND MR. E. G. GODBEY ATTEND CONFERENCE

Dr. J. H. Cooper, Dean of the School of Agriculture, and Mr. E. G. Godbey, associate animal husbandman, attended a pasture conference April 21. This conference was held at Quincy, Florida.
FARM TIMBER AND NATIONAL DEFENSE

By D. C. Eaddy, Jr., '45

An army "Travels on its stomach," but a little study of our modern army requirements shows that wood is almost as essential as food.

Much has been said and written about the tremendous loss in soil fertility that has occurred in the two centuries since our forefathers settled this United States of ours. Much of this loss of fertility is due to the wanton destruction of our forests by unscrupulous actions of turpentine stills, crostic cutters and pulp-mills that could have been easily and far more profitably fed with crooked or otherwise deformed trees.

Success in livestock production owes a great deal to the construction of adequate fences which are of necessity supported largely by wooden posts of pine or locust. These posts, treated with creosote or solutions of copper sulphate, commonly known as bluestone, or zinc chloride will last almost indefinitely. There are 470,000,000 acres of land in the United States classified as forest land. It may be said that there are six advantages of practicing farm forestry:

1. It insures a constant production of timber.
2. It offers an effective barrier to soil erosion.
3. It is one of the best methods to control stream flow and to check flood conditions.
4. It provides cover and feed for the preservation of wild life.
5. It converts land unsuitable for agricultural purposes into profitable production.
6. It makes possible the profitable use of farm labor in periods in which other farm work is at low ebb.

An army "travels on its stomach", but a little study of our modern army requirements shows that wood is almost as essential as food. Gum and cottonwood are used for crating and boxing; oak is used for office furniture to conserve steel. Tanks are carefully encased in wooden cases for shipment. As much lumber is required in crating a bomber for shipment as is needed in building a 5 room house. The construction of a battleship requires 300,000 feet of lumber (largely Southern pine). Lumber is also used to pack shells for protection in shipment.

Our duty as timber raisers is to supply needed timber that is mature, straight-grained, and solid. We can do this without gutting our forests for a few paltry dollars. We must do our share to "keep 'em rolling" and "keep 'em flying", but we must do it conservatively so as to have some reserved national wealth when this conflict is over. Timber may be considered as a savings bank yielding a high percentage of compound interest. Submarines may sink our ships, but they can't sink our forests.
McGINTY MADE PROVINCIAL SECRETARY OF PHI KAPPA PHI

Mr. R. A. McGinty, Vice-director of the Experiment Station, has been made Provincial Secretary of Phi Kappa Phi. Mr. McGinty replaces Dr. T. H. McHatton of the University of Georgia, who has been called into active duty in the United States Army.

**THE AGRARIAN**

**BOMBING RANGE TO BE BUILT**

Plans are being formed to use a plot above Lake Issaqueena as a bombing range. The planes using this range will be based at the Greenville airport. The bombing will be about two miles square.

**THE AGRARIAN**

**COLOSTRUM AND RECONSTITUTED SKIM-MILK USED AS A SUBSTITUTE FOR WHOLE MILK IN THE RATION OF DAIRY CALVES**

Colostrum, the secretion of the mammary glands of the cow immediately following the birth of the young, is considered almost indispensable to the newborn calf. It is undesirable for feeding older calves, and as a food for man. Hence, much of this product is discarded as waste. A combination of colostrum with skim milk, either reconstituted or fresh, results in a desirable substitute for whole milk in calf feeding. This practice makes it possible to market more whole milk.

**THE AGRARIAN**

**DRIED WHEY A VALUABLE SUPPLEMENT IN CALF FEEDING**

Dried whey, a by-product in the cheese industry, has proved to be a valuable supplement in the ration of dairy calves. It is especially beneficial for calves that are in a general unthrifty state. The specific role of dried whey in correcting malady has not been established.

**THE AGRARIAN**

**RIEGELDALE SALE AVERAGES $647**

The Riegeldale Sale held on April fourth at Trion, Georgia, resulted in an average of $647. Top animal, Douglaston Baroness Darling 53875, sold for $8,800. Five others brought better than a thousand dollars. The sale was attended by Professor J. P. LaMaster, head of the Dairy Department, and Mr. Vance Henry, dairy specialist of the Extension Service. The Riegeldale Herd is managed by Ralph W. Coarsey, a graduate of Clemson. While at Clemson he helped organize the Dairy Club. Before going to Riegeldale, Mr. Coarsey was county agent of Chester county and he is partly responsible for the fine Guernseys in Chester county.

**THE AGRARIAN**

**DR. GILBERT H. COLLINGS TO ADDRESS PENDLETON FARMERS’ SOCIETY**

The annual banquet of the Pendleton Farmer's Society will be held on the night of May sixth. Dr. Collings, president of the society, will give the principal address. This society is the fourth oldest Farmer's Society in the United States.

**THE AGRARIAN**

**DR. FRANK MOSER TO ENTER THE ARMY**

Dr. Frank Moser is expected to be called into active duty with the army. He is a member of the Agronomy Department and is connected with the Experiment Station.

**THE AGRARIAN**

**DR. A. E. PRINCE RECEIVES KRESS GRANT**

Dr. A. E. Prince of the Botany Department has received a grant from the Claude W. Kress research fund. He is to prepare a list of all fungi attacking crop plants, ornamental plants, and forest species in this section of the state.

**THE AGRARIAN**

**GOODALE RECEIVES AGRARIAN KEY**

Professor Ben Goodale, of the dairying department, was presented with an Agrarian key at a recent meeting of the Agrarian Staff for his four years of service as faculty advisor of that organization.

Professor Goodale was the speaker at this meeting and made suggestions for the boys working in the journalistic field. He also gave a short history of the Agrarian magazine and brought out a few of its highlights.

**THE AGRARIAN**

**AG. ENGINEER LEAVING**

Mr. Fagan of the Ag. Engineering Department has accepted a position at Oklahoma A. T. M. He will be head of the Ag. Engineering Department of that institution.
NEW MILK MARKETS

The Borden Milk Company has completed a milk plant in Chester and a receiving station in Newberry. The Chester plant will be able to handle a quarter of a million pounds per day. The Borden Company has invested $300,000 for buildings and equipment in the plant and the receiving station. The Chester plant will furnish a market to the farmers of Chester county and parts of York, Lancaster, Fairfield, and Union counties. The Newberry receiving station will furnish a market to the farmers of Newberry county and parts of Laurens, Saluda, Lexington, and Richland counties. The farmers are not expected to go into the dairy business but to use this new market as an additional source of income. Some farmers in Chester county have doubled their income by taking advantage of this new milk market. This market will also help to distribute the farm labor over the entire year.

THE AGRARIAN

FREE—A WAR-TIME GIFT TO THE NATION
1000 REGISTERED JERSEY BULLS

The Jersey breeders of America are giving away 1000 registered Jersey Bulls to the dairymen of America. These bulls have been selected from the finest blood lines of the World's Greatest Dairy Breed to be given to 1000 dairy farmers to improve the production, type and income of America's dairy herds. The bulls will be given away in August. Anybody interested in securing one of these bulls should write Jack Mesbit of the American Jersey Cattle Club, 324 West 23rd Street, New York, N. Y.

THE AGRARIAN

S. C. GUERNSEY SALE HELD IN NEWBERRY

The State Guernsey sale was held May 5 at the Newberry County fair grounds. The sale, usually held in Columbia was moved to Newberry because of the facilities that are available in Newberry, and because the buildings in Columbia previously used were not available this year. Fifty head of registered Guernseys were sold. An outstanding young heifer, donated by one of our oldest and best breeders, Mr. G. A. Sherrill, Cheraw, S. C., to the Guernsey Milk Fund for Relief of British and Channel Island Children, was included in the sale.

GRASS CAN HELP WIN THE WAR AND WRITE THE PEACE

In order that enough milk might be produced for national defense, every cow in the United States will have to increase one pint per day. This can be done by taking advantage of annual grazing crops. Grazing will also help the dairy farmers produce cheap milk. The dairy farmer is called upon to do his part in the defense of America.

THE AGRARIAN

SOY BEANS USED TO IMPROVE QUALITY OF SILAGE

South Carolina dairymen are turning more and more to soybeans with corn and sorghum to improve quality of silage. The addition of soybeans to corn and sorghum increases the protein, mineral, and vitamin content of the silage. Figures from S. C. D. H. I. A. records show that in 1937 only 1.75 of the silage fed to D. H. I. A. herds in South Carolina was cane and soybeans or corn and soybeans; the remainder being straight corn, cane, or small grain silage. By 1940 the per cent of corn and cane in combination with soybeans increased to 33.3 per cent. The trend was increasing in the amount of silage fed per cow during this period.

THE AGRARIAN

LaMASTER HONORED

Professor J. P. LaMaster, head of the Dairy Department, has been elected vice-chairman of the Dairy Science Section of the Association of Southern Agricultural Workers. He was elected at the annual meeting held in Memphis, Tennessee.

THE AGRARIAN

SOIL SAVING TIP

The life of an inch of topsoil was increased from 2 years to 29 years by contoured strip cropping of a field with a 5-percent slope in a soil saving test carried on by the U. S. Department of Agriculture at its Blackland Station at Temple Texas. These conservation practices reduced the rate of soil erosion from 1-acre inch in 2 years to 1-acre inch in 29 years, and results have indicated that this reduced rate of erosion can be offset by building up the yielding ability of terraced land with a good rotation.
THE AGRARIAN PRESENTS

BEN E. GOODALE

Professor . . . Organizer . . . Leader . . . Worker . . . Advisor

Ben E. Goodale, Associate Professor of Dairying

One does not have to go far on the Clemson Campus to meet and talk with people who have had interesting and sometimes extremely exciting experiences. Professor Goodale or "Big Ben," as he is affectionately known by Clemson men, is a man who has had a varied background and a life filled with activity worth knowing about.

Reared on a farm near Marshalltown, Iowa, Big Ben began his education in a one-room, one-teacher schoolhouse. Upon finishing grammar school, he completed his high schooling in Marshalltown.

Ben was vitally interested in dairying, so in the fall of 1916, he became a freshman majoring in Dairy Industry and Dairy Husbandry at the Iowa State College, Ames, Iowa. World War I intervened in 1917, so Ben became a member of the United States Armed Forces and off he went to Camp Crane, Allen-town, Pennsylvania. After his training period, he was sent to Halifax, Nova Scotia, where he boarded the transport Baldic headed for Europe. When the Irish shores were barely visible, a German torpedo found its mark and sauntered a hole in the ship's side. All men took turns at pumping out the inpouring water, and the ship finally made its way in.

All of Ben's 21 World War months were spent in special service with the French army. Except for occasional leaves, most of this time was spent at the active front, where Ben took part in four major offensives. During one of these offensives, he was gassed but he managed to have a successful recovery. All of his leaves were spent in investigation and study of foreign dairying systems.

The war ended, the Armistice signed, and Big Ben came marching home with a French Croix de Guerre which he was awarded for his brave and brilliant service. In the fall of 1919 he resumed his education in dairy husbandry and dairy industry at Iowa State.

Ben was truly an enthusiastic worker all through his college career. Besides undertaking a double major, he was organizer and president of a cooperative buyers organization; president of the Public Speaking Council, Dairy Club, and Honorary Dramatic Masqued players; member of the student governing body called the Cardinal Guild, the Interfraternity Council, and the Tau Kappa Epsilon. He played football, but this does not conclude his college accomplishments; every expense item was earned by him. He worked at jobs which paid him as little as fifty cents per day.

Twenty years ago Professor Goodale became an Associate Professor in the Dairy Department at a then small school called Clemson Agricultural College. He liked it so well that he has never left since that time except for the summer months which have been spent in graduate work, as an extension worker for the Julius Rosenwald Foundation, and as a manager for commercial dairy plants. In 1929 he obtained his M. S. degree at Iowa State, Ames, Iowa. His thesis was entitled The Influence of Soybeans on Market Milk and Butter.

An article in itself could be devoted to Big Ben's campus activities, so we will merely tell here of some of the most important ones. His job as associate professor of dairying includes the business of managing the Clemson College Creamery, teaching elementary dairying and teaching dairy manufactures. He is faculty advisor of all agricultural and agricultural engineering freshmen.

Professor Goodale wears a number of keys across his chest which designate some of the local organizations he is affiliated with. These are: member of The Blue Key, Phi Eta Sigma, Tiger Brotherhood, Mu
Prof. Goodale is a local member of the American Foreign Legion, and as many patriotic, defense minded people he is a member of the Pickens County Council for Defense and the Commander of the Calhoun-Clemson Citizens Defense Corps.

Professor Goodale's hobbies are obvious as seen by his numerous activities. Perhaps his greatest dislike is unpasteurized milk. His favorite sport is football. Most people will agree that he is a clever speaker, for his talks are filled with sly bits of humor as well as educational information. He is married and has a son, Gordon, studying Chemical Engineering here at Clemson.

When asked his opinion of The Agrarian he replied, "it is one of the greatest extra curricular activities in the Agricultural School, because it is a connecting link between schools, alumni, the faculty, and students." He believes that the Clemson Students are a grand group of men, and their equal cannot be found in any college.

The Clemson Cadets and the Clemson townspeople are deeply indebted to Professor "Big Ben" Goodale for his kind and thoughtful understanding in time of need, for his big smile and pleasing personality; and most of all, we owe him much for his loyalty and perpetual energy in all of his undertakings that have been so beneficial to us. We only hope that this article will be an inspiration to those of us who feel that we haven't the time to spend on an activity that would be helpful to our fellows.

In the community of Clemson, Professor Goodale is a charter member and was three times president of Clemson's only civic group, The Fellowship Club. This club maintains a clinic which Big Ben founded, and he is now in complete charge of it. He is chairman of the Community Welfare Committee which works with the cadet corps and the Boy Scouts in getting and distributing Christmas baskets each year. He is Deacon and acting chairman of the Presbyterian Church.
CITY LOOKS AT THE FARM
By J. L. Schaffer, '43

Harmonious relations between rural and urban dwellers will make for nationwide Prosperity.

The economic conditions of the city are very dependent on conditions of the farmers. With specialization in industry greater than ever before, we are inclined to look at one industry, usually one we have some connection with, as one of great importance. The great diversity of the farm industry tends to make us forget that the farm industry is the basic industry of this and almost every nation.

The year before the free land of the United States was settled, there was a great interest in the rural section of this country by the city folk. The land always afforded them an opportunity to alleviate an economic pressure of the city. If things became too difficult, they could pack their meager belongings and go to the land that was waiting for them. Today all this free land is exhausted, and the city folk have lost some of the former interest they had. Their losing of interest has not been complete by any means. There are still many people who desire to go back to the farm, but the lack of suitable land does not permit them. This has caused a problem of major importance. There now is a heavy pressure of population on our land supply. This pressure is sure of increase many-fold with the successful completion of the present war.

The city looks to the farm as a source of manpower, and they are most interested in the welfare of this future labor. It must be realized that the rural areas educate and care for one-third of the nation's children, and they have to do this on less than ten percent of the national income. This causes the rural folk to be in poor health and poorly educated. When these people attain the age of maturity and come to the city, this problem then faces the urban and in most cases, the city can do little or nothing for these unfortunate farm folk. These people are not ready for the highly specialized jobs that the city is ready to offer and are forced to take common labor for which there is always a plentiful supply, except in emergencies as the present.

It may be surprising to say that city folk are very interested in soil erosion, not directed perhaps but indirectly, without doubt. As the soil is depleted, the amount of arable land is decreased. The demand of most crops are usually stable and when the supply goes down, the price naturally goes up proportionally. When prices go up they affect the city person and there is a great interest on their part why this has happened.

In times of rural unemployment, the city feels the repercussions. It usually takes the urban dollar to support these unemployed. In many cases, these unemployed come to the city seeking employment. They offer competition to the urban laborers, and they are willing to take less wages than the city folk. This has caused widespread fear on the part of city labor that the standard of living will be forced down by a new supply of cheap labor.

In times of depression, the rural areas acted as a great shock absorber in two ways. Farm prices are the first to rise and great multitudes of the urban population can move out to farm areas. In poor times, it is the farm prices that fall first, and they fall further than manufactured goods.

These are but a few things that interest the people in the city in relation to farm folk. One can not draw a line of separation between rural and urban. They are dependent on one another in every way. What affects one is sure to affect the other in some way. The sooner the two work in complete harmony the sooner will our Country prosper. In the future, let all planning be done with rural and urban holding an equal place in arriving at the desired goal.
THEORY FOR AGRICULTURE
By M.O. Berry, '43

Theory is the foundation of an achievement as it is notably observed in the breeding of hybrids and in the development of farm machinery.

How many of you have read this article believe in theory as a basis for agriculture? Chances are that only about twenty-five percent of you would consider theory at all. Yet, how else did the art of agriculture have its beginning but in theory? Someone at first had an idea that it would be better to grow plants for food rather than depend wholly on Mother Nature. This was pure theory at the beginning for cultivation of crops had never been attempted before, and so it remained until actually carried out.

Practically all of our present forms of agriculture are based on theories, but they have since become practical applications that are suited to everyday farm use. This fact leads us to what is important to all agriculturists at this time—results are what count and they can be attained most rapidly now through the use of established farm practices; but advancement in the methods of farming to be used in the future, improvements over existing plant breeds and farm implements, and the extensive application of electrical power to faster and more economical farm production must be accomplished to meet the ever-growing demand for food and raw materials secured from the farm. Theory will have to be the foundation for such achievements as it has notably been in the breeding of hybrids and in the development of the family size farm machinery units for the south.

Theory is usually thought of as stated facts that have been calculated experimentally; with laboratory research as the background for calculations. How, then, are you to use theory in your farm program? Read published data about your soil types, find out why certain fertilizers and machines are recommended for your part of the state, ask your R. E. A. supervisor how to use electricity to the greatest advantage on your farm. Your county agent has been taught the why and wherefore of suiting crops to soil conditions, the economics of farm operations, and the practical utilization of location and marketing facilities. He knows the theory; most of it is the result of experiments carried out under your local conditions. Get it from him and use these facts to help you profit.

However, theory is not limited to printed matter or the book learning of an individual who has studied agriculture but broadens out to take in the ideas of the farm operator himself, for an idea is usually a result of theoretical reasoning based on past occurrences. If theory is to be utilized in advancing agriculture, every farmer must put his ideas to a test to eliminate the poorer quality materials and methods with which he has been acquainted.

The primary purpose of this article is to get you to use your knowledge for the improvement of farm machinery. All of you farmers of this state have a variety of undeveloped ideas concerning needed changes in the design of present farm equipment. The manufacturers produce implements that have been tested, but there are always better arrangements for power machinery to gain more efficient and more accurate operation.

If you want to secure the latest theories regarding modern farming, write to the experiment station here at Clemson or ask your local agricultural teacher to procure the information for you. Particularly

Continued on Page 22
Experimental Facilities

Hog Barn
at
Clemson College

Agronomy
Field Laboratory

Greenhouse
and
Workroom

Courtesy S. C. Experiment Station

Courtesy S. C. Experiment Station

Courtesy S. C. Experiment Station
Breeding Work with turkeys is being carried on now at Clemson.

S. C. Farmers are being assisted in improving their yields and quality of hay.

"Sham Feeding" experimental calves
GONE WITH THE RIVER...

By E. P. Huguenin, '42

The program of reforestation of idle and eroded land is making rapid progress in the state. This is an excellent method of retarding erosion.

The Soil Conservation program includes the construction of complete waterways and the adoption of a complete program of land use on each farm.

South Carolina farmers either through ignorance or indifference are guilty of one of the most disgraceful exhibitions of careless waste in the history of the South. Starting off with some of the poorest land in the country we have allowed practically all of the best of this, the topsoil, to wash away. The Seneca and Saluda rivers aren't red from choice, their tomato juice color is nothing more than dissolved farms on their way to the sea. The great pity is that the ones who should be most concerned about this appalling waste, give it little thought and do still less about it.

With government workers literally begging the farmers to allow them to take a part in the fight against this insidious thief, they receive little help and almost no encouragement.

In our United States the problem is greater than in South Africa where, according to General J. G. Smith, "Erosion is one of the biggest problems confronting the country, bigger than any politics." Since the start of the present conflict erosion takes a back seat to our "all out" effort, but its importance is still as great as before. A nation can eke out a bare existence if they lack iron, coal, or some other necessity, but fertile soil cannot be bought—it has to be built. Where erosion is present in large amounts fertile soil is noticeable by its complete absence.

The extinction of a nation by erosion is not an improbability that may occur at some future date, it has occurred in the past and doubtless will again.

South Carolina farmers, you must wake up to the fact that fertile soil is never eroded soil and fertile soil is the same thing as money in the bank, an enjoyment as well as a constant source of supply.

VOLUNTARILY ENLIST IN THIS FIGHT BEFORE COMPULSORY MEASURES ARE TAKEN.

Hordes of gullies now remind us.
We should build our lands to stay,
And, in parting, leave behind us,
Fields that have not washed away;
When our boys assume the mortgage
On the land that's had our toil,
They'll not have to ask the question
"Here's the land, but where's the soil?"

T. V. A.
ABOUT THIS AND THAT

By The Editors

Lost $3,075,000

Hats off to the wily fertilizer salesman! To him goes a great deal of credit for keeping the farm income in South Carolina hovering around the $240 mark. But he must share his glory with those agriculture workers who have made for themselves a cloak of negligence. This combination of salesmanship and lack of teaching has caused farmers in this state to pay as high as thirty or forty cents out of each fertilizer dollar for unneeded bagging and transportation of sand in the last few years.

To prove the point, let’s look at some pertinent figures that can easily prove to any intelligent farmer that he is paying dearly for using low analysis fertilizers. Of each dollar spent for a 3-6-6, fifty-one cents goes for manufacturing, packing and distributing the goods while forty-nine cents pays for the ingredients. In the case of high analysis fertilizer, say an 8-16-16, only twenty cents of each dollar goes for manufacturing, packing and distributing and thirty-nine cents for the ingredients. A change from 3-6-6 to 8-16-16 would therefore save the farmer forty-one cents out of each dollar spent for fertilizer. In substituting the 8-16-16, the farmer would find it necessary to use only about one-third the amount used when 3-6-6 was applied to get the same amount of plant food. This would in turn release for war purposes many boxcars and trucks since only one truck would be needed where three were used before.

Perhaps forty-one cents doesn’t look very impressive, but when placed on a statewide basis it assumes enormous proportions. Of the 400,000 tons of fertilizer sold in South Carolina in 1941, approximately fifty per cent was sixteen unit grade and seventy-five percent was of eighteen units or less. Assuming that the average price per ton was twenty-five dollars, South Carolina farmers lost $3,075,000 by not using the 8-16-16. Three million dollars is ten per cent of the entire income of the State of South Carolina from tax sources.

But the loss sustained by our farmers does not end at $3,075,000, because our cotton yield is 231 pounds per acre, corn returns only 13.3 bushels and our bony cows inhale dust in grassless pastures. These figures are ten year averages and serve to indicate how much money South Carolina farmers are NOT making. It can be made, because one to two bales per acre of cotton are not uncommon in this state and only last year a national corn yield record was established in Lexington county. Lush green pastures and bulging silos in some sections of the state prove that good pasturage and silage can be grown.

Of course, the fertilizer salesman has not pushed high analysis goods—but neither has the majority of state-paid workers in agriculture. Only through increased efforts on the part of the latter can the South Carolina farmer save himself $3,075,000. These figures must be put before the farmer. Teachers, county agents, other agricultural workers—GET ON YOUR JOB!

S. K. A.

SHORTAGE OF PROFESSORS

The expectation of an increase in demand and a limited supply of college instructors and research workers has come to reality. The limited number of professors is fully felt this semester and will probably be felt even greater next year as the selective service boards continue to call men in the armed forces.

In one of the departments in the school of agriculture here at Clemson, there are only two professors left in the department, and both are expected to be called this summer. One can readily see that such cases are going to cause major adjustments in the faculty for the next coming school year.

We are very fortunate in the school of agriculture that many of the research workers of the experiment station and the extension service are capable of assuming the vacancies left by the professors. Many of the men are employed both as an instructor by the college and as research workers by the experiment station. If a necessity arises under such a system, the research men can devote their entire time as instructors.

Rather than let any of the departments become vacated, the most capable senior students could be secured to do part time teaching. We may rest assured that when school begins next fall there will be a sufficient number of instructors here to teach us.

C. B. F.

SENSE OR SILENCE

It is a fundamental fact that words can help and conversely they can hurt. Hardly a day goes by that most of us speak thoughtlessly and often utter words of a harmful nature to our “buddies.” It is an easy task to be sorry, but does being sorry heal the hurt?

Let us reverse our carefree habits. It is no simple matter to change overnight, but aren’t men capable enough to evaluate their thoughts and express them in a beneficial fashion?

Most men hunger for recognition and popularity of the right sort. Saying no mean words and complimenting others may help. Why not begin now to give this thought a trial.

C. A. J., III.
14 Points for Victory

2. Build “War Production” houses, not “Defense” houses.
3. “Produce” and not waste time talking about “hours” and “profits.”
4. Start an “Offense” and not always be on the “Defense.”
5. Have a “positive” program, not a “passive” one.
6. Start “hating” Hitler and Hirohito and not “make fun” of them.
7. Sing “fighting” songs and ignore “boogie-woogie.”
8. Know what we are fighting “for”, not what we are fighting “against.”
9. Spread the doctrine of Americanism to “other” shores, and not only try to keep Hitlerism “from” our shores.
10. “Avenge” Pearl Harbor, not just “remem-b” it.
12. “Sacrifice,” not just give what we can easily spare.
13. Get “fighting mad” and not remain indifferent.
14. “Win” the war quickly!

E. P. H.

THE VALUE OF FORAGE CROPS IN THE PRODUCTION OF HOGS

Continued from Page 6

than do those confined to dry lot, other conditions being the same; forage crops help to produce more economical pork, for it cuts the protein supplement in half; pigs feeding on forage help to enrich the soil, for the land receives the full benefit of the droppings; pigs which have been on forage during the summer do much better and gain more rapidly during the winter when on dry lot; and finally and most important, forage crops mean improved sanitary conditions for the pigs.

THE AGRARIAN

THEORY FOR AGRICULTURE

Continued from Page 17

should new ideas in power farming be obtained because of the recent developments in design for planting and harvesting equipment.

Practicality has its rightful place in farming, and those men who have used theory with their acquired knowledge have advanced faster and farther in the change from animal to mechanical power to lighten farm work and to secure a greater net return over labor cost. Why not let the theoretical ideas help you?
YOUTH Gets a Break
Plowmen Get a Lift

The American Way of Life
Still Offers Youth Opportunity

With the foot-lift, riding plows became really practical. Farmers found their work faster and easier, all because ... forty years before ... the American system of free enterprise and unfettered opportunity had given a break to an obscure boy named Ralph Emerson. His firm, grown great and become the Emerson-Brantingham Company, finally was joined with the J. I. Case Co., bringing to Case the most modern, most efficient plow-building plant anywhere in the world.

Each year this business gives a break to young men fitted by temperament and training to create, build and sell better farm equipment. To many more it gives a break by furnishing them power and machines to make their farming easier, faster, more effective, more economical. For a hundred years Case has stood with youth on the principle that the better man, the better method, and the better machine shall have their chance. In the preservation of that principle is both the future opportunity and the present problem of youth in America. J. I. Case Co., Racine, Wis.

Kin to Ralph Waldo Emerson was another Ralph Emerson. Son of a clergyman and brother to a professor of Greek who helped found Beloit College, he fell heir to much that was mental, less that was material. At Andover, where his father taught theology in the Seminary, Ralph herded cows for the professors, taught a term of country school. Following his brother to Beloit he got a job as bookkeeper, soon became partner in a small hardware business at Rockford, then junior partner in a reaper-building enterprise.

Suddenly the head of the business died. The panic of 1857 froze the firm's assets. At the age of 26 Ralph bore the burden of managing a business with nearly half a million dollars of debts. Spurning easy escape by assignment, he won the co-operation of creditors, kept on building reapers, harvesters, cotton cultivators, more and more kinds of tools to make life better on the farm. And then, in the fullness of years and of vision, he received kindly an inventor whose plan for improving plows had been rejected by the big plow-makers. It was the Emerson foot-lift that made play of handling the heaviest plows of the horse-drawn era, the last great event in tillage before the dawn of power farming.

1842 CASE Centennial Jubilee 1942
ENGINEERING AS APPLIED TO AGRICULTURE

Continued from Page 9

The soil loss in the United States each year is enormous. Few realized that it requires 100 years for nature to replace one inch of top soil. If there is anything that we must not lose, it is this precious soil. The A.A.A. in cooperation with the Soil Conservation Service has been emphasizing the importance of proper methods of control. Systems of terracing and drainage vary with the soil type, percent slope, and the general physical condition of the soil. For the masses of farmers to set up the proper and necessary required control measures, they must know their local soil type. They must know how to calculate and determine the slope. Finally, they should understand the laying out of terraces and drainage systems. In order to lay out a terrace, one must be able to operate a transit or a dumpy level. A thorough knowledge of contour mapping is essential. Each year we can see these surveys take on added importance.

In the field of motors and power machinery, we see all the principles of good engineering being applied on the farm. Mechanization must go hand-in-hand with these principles. Power machinery as combines, ensilage cutters, and corn harvesters is an assembly of intricate mechanisms operating as a unit for the same function. A detailed knowledge of the operation of these machines is essential for their proper functioning. For instance, the amount of air necessary to clean oats in a combine is different from the amount required to clean lespedeza. The cylinder speed is different, and the space between the cylinder bars and concaves also varies. These adjustments must be made before attempting to harvest any particular crop.

The maintenance of tractor motors and stationary gas engines is another major requirement of a good farm operator. Motors are a complex unit which requires constant care. Even though motors 'never get tired', so to speak, is no excuse for mistreatment. This line of thought reveals some of the most invariable reasoning that can be attributed to mechanization. For anything to function properly, be it plant, animal, or machine, all the limiting factors have to be overcome.

Protect Your Peach Crop

— with —

PAN PEACH SPRAY

PAN contains all the necessary ingredients to assure maximum protection.

SIMPLE TO USE

PAN is used at the rate of 8 pounds to 50 gallons of water and is put up in convenient units:

Cases of 4-8 lb. bags, cases of 2-16 lb. bags and cases of 4-16 lb. bags.

Leading peach growers throughout the country find PAN PEACH SPRAY the best answer to their spraying problems.

The J. W. Woolfolk, Ltd.
MANUFACTURERS
Fort Valley, Georgia

THE CLEMSON COLLEGE

SUMMER SCHOOL

OPENS JUNE 1

THE ANIMAL HUSBANDRY
DEPARTMENT
of
Clemson College

Purebred
Berkshire Swine
Polled Hereford Cattle
Hampshire and Southdown Sheep
**THERE'S A BOMB**

**IN YOUR BARNYARD**

It's a dumb, now. Just a pile of junk. It's your SCRAP metal! Rusting away and no earthly good to you or to the courageous men fighting this war. They need it. Their lives depend on it. Your lives depend on it. Let Uncle Sam load this bomb for you!

Scrap metal makes munitions. A one-ton bomb requires 500 pounds of it. A 75-mm. howitzer takes half a ton. And the mills are not getting enough scrap metal to maintain the steel production demanded by war industry.

By far the biggest pile of scrap metal left in America is on farms. Three million tons of it or more. And it's going to have every pound of this scrap to win this war. That's why it's up to you to collect all your scrap and get it moving before you do anything else. It may take a day or two of your time, but until it's done, there is nothing you can possibly do that's more important.

**The Harvester Dealer Will Help You**

Because this job is big, and scrap is tough to handle, International Harvester, in cooperation with the Government, has asked every one of its dealers to lend a hand. And they are doing an immense salvage job. In towns where there is no junk yard, Harvester dealers have set up collection points. They are accumulating piles of scrap from farms—selling these piles to scrap dealers—and turning the entire proceeds back to the farmers who bring in the scrap. Harvester dealers are not taking a penny of pay for their part in the transaction.

In other towns where there are junk yards, Harvester dealers organize drives to get metal moving directly from farms to scrap dealers where it can be broken down, sorted, and segregated for the mills.

In all this work these men have only one goal—to get all the scrap metal from all the farms moving to the mills. The pictures show some of the ways they are getting this job done.

Get your own scrap together now. Comb your attic, fields and fence corners for old metal. Be sure that it's all scrap and contains no valuable parts or equipment you may need later. Then call on your Harvester dealer for advice on the best way to send it off to be loaded for war!

**INTERNATIONAL HARVESTER COMPANY**

160 North Michigan Avenue
Chicago, Illinois

**RECEIPTS—GOOD FOR CASH**

When Harvester dealers set up scrap depots, they give farmers receipts for every pound of metal brought in. When the scrap is sold, these receipts are redeemed in full in cash or War Savings Stamps. Dealers charge no commission.

**PRIZE MONEY—FOR BOYS AND GIRLS**

To stir up enthusiasm and get everybody working, Harvester dealers in various places offer prizes to the 4-H Club member or Future Farmer who gets in the biggest load of scrap during a drive.

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**CHILDREN UNDERSTAND—AND ACT!**

Out in Oklahoma a Harvester dealer named Will H. Ford got word to the rural schools that Uncle Sam needs scrap metal now. Today in Will Ford's county 8,000 school children in 57 schools are busy as beavers. In the first three weeks they have dug up 647 TONS of "scrap to slap the Japs." Enough from one county to build a fleet of 36 medium tanks!

Champion "scraper" of the primary department at Velma School is eight-year-old Wanda Ely who hunted up 352 pounds of old metal, "all by herself," and brought it to school in her arms.

**SEND THIS SCRAP TO THE JAPS—WITH POWDER BEHIND IT!**

With these explosive words to an International Harvester dealer, Ira Gould, 80-year-old farmer of Bone Gap, Illinois, sent his scrap metal off to war. If every farmer in the United States will follow Mr. Gould's patriotic example and get rid of his scrap at once, this country will take a tremendous stride toward winning the war.

Down in Missouri, ninety-seven farmers have been hard at it at the urgent request of Harvester dealer George J. Seeger, of Creve Coeur. In one big day they loaded all the scrap they could find and brought it to town. It was weighed at a local elevator and George Seeger gave each man a receipt for his tonnage. As the junk from this 100-ton pile is sold to scrap dealers—at prices far above what it would bring on the farms—all proceeds are turned back to the men who brought it in. Many take payment in War Savings Stamps and Bonds.

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**WHEN EVERYBODY WORKS YOU CAN BUILD A SCRAP IRON MOUNTAIN!**
YOU WANT STEADY NERVES

when you’re flying Uncle Sam’s bombers across the ocean

GERMANS OR JAPS, storms or ice... you’ve got to be ready for anything when you’re flying the big bombers across the ocean to the battle-front. You bet you want steady nerves. These two veterans above are Camel smokers. (Names censored by Bomber Ferry Command.) The captain (nearest camera), a Tennessean, says: “I smoke a lot in this job, I stick to Camels. There’s less nicotine in the smoke. And Camels taste great!”

STEADY SMOKERS STICK TO CAMELS

There’s LESS NICOTINE in the smoke

The smoke of slower-burning Camels contains 28% less nicotine than the average of the 4 other-largest-selling brands tested—less than any of them—according to independent scientific tests of the smoke itself!

WITH THESE MEN WHO FLY BOMBERS, it’s Camels all the time. The co-pilot of this crew (name censored), (second from left, above) says: “I found Camels a milder, better smoke for me in every way. And that grand flavor never wears out its welcome.” Yes, in times like these when there’s added tension and strain for everyone, steady smokers stick to Camels—the cigarette with less nicotine in the smoke.

FIRST IN THE SERVICE—
The favorite cigarette with men in the Army, the Navy, the Marines, and the Coast Guard is Camel. (Based on actual sales records in Post Exchanges, Sales Commissaries, Ship’s Service Stores, Ship’s Stores, and Canteens.)

—AND THE FAVORITE AT HOME!