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The Agrarian Vol. 14 No. 4

Clemson University

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Planters
Fertilizer & Phosphate Co.

CHARLESTON, S. C.  CHARLOTTE, N. C.
### The Agrarian

**Volume XIV**

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Niles C. Clark, Jr.</td>
<td>Co-Editor</td>
</tr>
<tr>
<td>John D. Patrick</td>
<td>Advertising Manager</td>
</tr>
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<td>Associate Editor</td>
</tr>
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<td>Business Manager</td>
</tr>
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<td>Co-Editor</td>
</tr>
<tr>
<td>Thomas E. Hayden, Jr.</td>
<td>Circulation Manager</td>
</tr>
</tbody>
</table>

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Walter Ramage ..... Dept. Editor

**Departmental Writers—**


**Advisory Staff—**

- Louis D. Parsons.

- Edward Corley, Earl Little.

- B. E. Goodale and T. L. Senn.

**THE COVER:** With the recent decline in cattle prices has come a large amount of criticism of beef production. Even though the cycle of prices for cattle seems to be at a low level, beef cattle remains the best method to market roughages and other farm products which might not otherwise be utilized. Let's use more cheap feed for our cattle to show more profit. Our cover shows a picturesque herd in lower South Carolina. (Photo courtesy Extension Service)

### IN THIS ISSUE

<table>
<thead>
<tr>
<th>Topic</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Career Opportunities in Agriculture</td>
<td>3</td>
</tr>
<tr>
<td>Crossbreeding — For more Profit</td>
<td>4</td>
</tr>
<tr>
<td>Essentials for Successful Broiler Production</td>
<td>6</td>
</tr>
<tr>
<td>A Good Insect Control Program</td>
<td>8</td>
</tr>
<tr>
<td>Switzerland — Garden Spot of Europe</td>
<td>9</td>
</tr>
<tr>
<td>Between the Furrows</td>
<td>10</td>
</tr>
<tr>
<td>The Men Who Guide Us</td>
<td>12</td>
</tr>
<tr>
<td>The Hardwood Problem in South Carolina</td>
<td>14</td>
</tr>
<tr>
<td>Farmpond Site Selection</td>
<td>16</td>
</tr>
</tbody>
</table>

**THE AGRARIAN**—published in November, January, March and May by the undergraduate students in the School of Agriculture and the Department of Vocational Agricultural Education of the School of Education, and sponsored by the South Carolina chapter of Alpha Zeta. Opinions expressed in this magazine do not necessarily reflect the policy of the School of Agriculture or Clemson College.

**Advertising Rates Free on Request—**

- All correspondence should be addressed to The Agrarian, Clemson College, Clemson, S. C.
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**AGRARIAN PHILOSOPHY**

**Niles C. Clark, Jr., Co-Editor**

Another school year has almost passed, and with this issue, the old “Agrarian” staff will turn the reins over to the new staff. A very capable and energetic staff has been selected for next school year, and to these men we give our best wishes for a successful year. Donald Anthony and Elbridge Wright will be filling the Co-Editor positions, and we feel that they will be doing an exceptionally good job.

Our thanks go to the many persons who have contributed toward printing our magazine this year. To our advertisers we wish continued success in the coming years. We also would like to thank the persons who have made contributions to the “Agrarian.”

It is our hope to continue mailing the magazine to students, farm families, libraries, and schools with no charge in the form of a subscription rate. This creates a hardship due to the fact that almost all advertising fees must be used for printing and mailing, thus leaving almost no funds with which to buy equipment and supplies. However, as long as we are able to make ends meet, we hope to continue mailing the “Agrarian” to anyone who desires it.

As a parting thought, we would like to leave this anonymous poem which, we think, contains much truth.

**THE WINNER**

The man who wins is an average man
Not built on any peculiar plan
Nor bles with any peculiar luck—
Just steady and earnest and full of pluck.

When asked a question he does not guess
He knows the answer, "No" or "Yes"—
When set a task that the rest can’t do
He buckles down 'til he puts it through.

So he works and waits 'til one fine day
There’s a better job with bigger pay
And the man who shirked whenever he could
Is passed by the man whose work made good.

For the man who wins is the man who WORKS
Who neither labor nor trouble shirks
Who uses his hands, his head, his eyes—
The man who wins is THE MAN WHO TRIES.
Two familiar old faces always welcome you back to the campus.

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Career Opportunities in Agriculture

Agriculture is the basic industry. A recent study reports: "Of 62 million employed Americans, 25 million work somewhere in Agriculture—10 million on farms, 6 million produce for and service farmers, and 9 million process and distribute farm products. About 40 percent of all jobs are in agriculture—jobs important to everyone, jobs with futures, jobs with financial and personal rewards."

Agriculture needs college-trained men in farming and in numerous occupations in agricultural research, agricultural business, agricultural industry, agricultural education, agricultural communications, agricultural conservation, and agricultural services. The present supply of college graduates is too small to meet the demand.

There are more than 500 occupations in the eight major areas of agricultural employment. It was recently found that the eight areas would employ about 15,000 new college graduates each year. Our land-grant agricultural colleges, such as Clemson, are now graduating around 8,500 students each year in agricultural courses. This means that we now have about two jobs for each graduate. Some of the job opportunities in each of the eight major areas of agricultural employment are listed below.

Farming—About 2,000 new college agricultural graduates are needed in this area of work each year. Farming is the most important job in agriculture, and it is becoming more and more complicated. The different types of farming which a young man may select include: general, dairy, poultry, beef, swine, cotton, tobacco, fruits, vegetables, seeds, and grain.

Agricultural Research—Each year, agriculture needs 1,000 new college graduates entering this field of work. Research seeks new information of value in solving agricultural problems. Opportunities in research are available in jobs related to production, marketing, economics, agricultural engineering, processing, new products, by-products, and conservation.

Agricultural Industry—3,000 new graduates can be used each year in this area of employment. Farmers depend upon industry for most of their supplies and equipment. Industry needs outstanding young men with thorough agricultural training. Graduates are needed in industries involving machinery and equipment, food processing, grain and seed products, meat and poultry packing, fertilizer and lime, pesticides and herbicides, feed manufacturing, dairy processing, and forest products.

Agricultural Business—Each year, business can use 3,000 new college graduates. Agricultural businessmen in finance, insurance, buy, sell, store, and distribute agricultural products. Specific jobs may be found in banking and credit, insurance, farm management, cooperative management, land appraisal, marketing, storage, transportation, and private businesses.

Agricultural Education—3,000 new agricultural graduates can find work in the field of education each year. It has been said that teaching is America's greatest enterprise. Job opportunities are available in college teaching, agricultural extension, vocational agriculture, governmental agencies, farm organizations, industrial agencies, and business firms.

Agricultural Communications—500 new college graduates are needed each year in the field of communications. Some very good opportunities exist for students with good training in both agriculture and communications. Jobs are available in farm reporting, newspaper and magazine work, market reporting, publications, photography, motion pictures, radio, television, advertising, and exhibiting.

Agricultural Conservation—Present estimates indicate we need 1,000 new graduates each year in agricultural conservation. This area of employment provides opportunities for important services in the conservation of our natural resources. Specific careers are available in the conservation of soil, water, forests, fish, and wildlife.

Agricultural Services—About 1,500 new graduates are needed each year in agricultural services. Government and private services in agriculture provide some very good career opportunities. Jobs are available in work related to plant and animal inspection, fertilizer and seed inspection, quality control and grading, foreign agricultural service, and veterinary medicine.

The School of Agriculture at Clemson offers college training leading to employment in most of the occupations which have been described. Four-year courses of study are available in Agricultural Economics, Agronomy, Animal Husbandry, Botany, Dairying, Entomology Horticulture, Poultry, and Agricultural Engineering. The curriculum in Agricultural Engineering is jointly ad-

MAY 1955

THREE
Crossbreeding -- for more profit

R. F. Elliott, A.H. '56

During the past few decades there has been increased interest in and acceptance of hybrid animals. However, many people don't realize that the law of heterosis or "hybrid vigor" is a basic law of genetics just as Newton's law of motion is basic in physics. It isn't limited to plants, but applies to animals as well.

This heterosis is the first and most important reason for crossbreeding commercial meat production. There is another reason for crossbreeding, which is older and better known. That is the crossing of unrelated animals, each having strong and weak points, with the purpose of combining the strong points. This second reason is largely responsible for the crossbred breeds such as Santa Gertrudis in cattle and Hamparan in hogs.

Crossbreeding Hogs

It is in pork production that the effects of hybrid vigor are most clearly seen. From the standpoint of hybrid vigor alone, the following advantages have been shown experimentally in favor of crossbred over purebred pigs: (1) There are fewer stillborn pigs, (2) Pigs are larger and more vigorous at birth and consequently a larger percentage reaches weaning age, (3) The pigs weigh three to four pounds more at weaning, (4) The pigs reach market weight ten to fourteen days earlier than purebred pigs and (5) Crossbred pigs require up to thirty pounds less feed to reach market weight.

From the standpoint of crossbreeding for type as well as for hybrid vigor, there has been much crossbreeding of bacon type hogs with meat type hogs to produce a more intermediate hog. The unusual prolificness of some of the bacon breeds is another strong point in favor of using them in crossbreeding.

There are two general procedures which are practical in hog crossbreeding. These are not cut-and-dried procedures, but are the result of an effort to divide innumerable methods into two general classes. The first and oldest method is the practice of selecting sows from one breed and boars from another breed. The sows should be of a breed known for large litters, mothering and milking ability. The boars should be from a breed which excels in gaining ability, early maturity, and market quality. Each breed should supplement the other as much as possible in type. The problem in this system is the replacement of sows. Purebred or grade sows must be bought or raised separately.

The second method is relatively new and promises to be popular because it solves the problem of the first method. In this method boars of a breed A are bred to sows of a breed B. Crossbred gilts AB are bred to a boar of breed B. Gilt of this cross are bred to a boar of breed A, etc. This method is also advantageous in that it makes use of hybrid vigor in the sows as well as in the pigs.

Crossbreeding Beef Cattle

There has been less work done on crossbreeding cattle than with hogs. However there is definite evidence that crossbreeding in beef cattle does result in a certain amount of hybrid vigor. The most important advantages of crossbred calves are: (1) More vigorous calves, and (2) More rapid gains.

However, due to emphasis placed on color markings on cattle, both by buyers and sellers, and due to the high cost of good sires, it is doubtful whether the average beef farmer in the Southeast would find crossbreeding a profitable practice.

Crossbreeding Sheep

Crossbreeding is practiced very extensively in commercial sheep flocks. The most common practice is that of keeping fine woolled ewes for production of a high grade wool and breeding a meatier typed breed to them. The lambs are consequently large and fast-growing. This system demands that rams and ewes be purchased as they are needed or that two flocks be managed.

The animal breeder must remember that there is no magic in crossbreeding. Genetically speaking there are no new genes created, but new combinations are created. In view of this the importance of high quality foundation stock and breeding stock is clearly realized. Thus the crossbreeder does not replace the purebred breeder, but actually increases his importance with the amplified importance of purebred sires, the production of which is the basic purpose of the purebred breeder.
ALFALFA WEEVIL
*Hypera postica* (Gyll.)
The Alfalfa weevil is one of the major insect pests of alfalfa in the United States. It causes greatest damage to the first crop. Adult females lay from 600 to 800 eggs in alfalfa stems. An imported wasp is a parasite of the larvae, but it does not destroy enough second crop weevils to prevent a large build-up of weevils the succeeding year.

SWEETCLOVER WEEVIL
*Sitona cylindricollis* Fahr.
Sweetclover weevils are small, slender, drab gray snout weevils. They feed on tender plant leaves and stems, eating out circular notches. Natives of Europe, these insects were discovered in Canada in 1924, and have spread at a rate of more than 100 miles a year. They now extend over most of the United States and Canada. They move in armies of a hundred or more per square foot.

SALT-MARSH CATERPILLAR
*Estigmene acrea* (Drury)
Mature caterpillars are either light green or dark brown. They attack alfalfa and other crops and travel in hordes. The adult female moth lays as many as 1000 pale yellow eggs from which hatch tiny dark brown caterpillars. There are three generations of pests in the southern localities, two in the Midwest, and only one in New England. In the South, the third generation causes the greatest damage.
Essentials for Successful Broiler Production

Lawton Wofford, P.H. '57

Proper sanitation is one of the biggest factors of success in raising chickens. A chicken likes to have clean surrounding just as a human does. Before obtaining a new lot of chickens the chickenhouse should be cleaned thoroughly. The first thing to do is to take out all the equipment that has been used in raising the previous lot. Having done this, haul out all the manure and shavings. The next thing is to take a garden hose and wash the cobwebs and dust out. The reason for this is to help get rid of disease germs that the previous group of chickens might have left. Following this, spray the house with a disinfectant that will kill all that the general cleaning did not kill. The next step to perform is to have fresh shavings put in the house. The shavings should be scattered evenly all over the house so that they are about six to twelve inches deep.

After the house is cleaned out, the feeders and waterers should be washed and disinfected before they are put back into the house. The reason for this is that feeders and waterers which have been used by older chickens can transmit diseases to the younger chickens very easily. Waterers should be disinfected daily, for chickens like to have fresh clean water just as you and I do. The waterers get polluted with dust and dirt from the chickens jumping and flying over them. When the chicken takes a drink of water, its beak is filled with feed, which gets into the water too. Disinfecting and cleaning the waterers daily keeps impurities out of the water and kills germs.

Good housing can determine the outcome for a flock of chickens. A chicken house should be large enough for the number of chickens you plan to put into it. If the chickens are crowded in a house, they will not grow as fast as they would otherwise. The house should be large enough to allow for the free movement of each chicken. Balancing the number of chickens against the available space is an important factor in having proper housing for chickens. The house should be situated so that the sun will shine in it the better part of the day. During the summer when the day is hot and chickens don't eat much. Lights should be burned at night so that the chickens will eat when it is cool. Feed troughs should be arranged so that there will not be a shadow on the feed. If there is a shadow on the feed in the troughs the chickens will not eat much feed out of that trough. Burning lights at night will help to keep out rats and other animals that might kill or frighten the chickens.

A chicken house should be built so that it has proper ventilation. In this way chickens will have fresh air all the time. Avoid drafts on the chickens because drafts predispose chickens to colds. During the winter months curtains or windows should be put over the wire openings to keep the cold air out. During the summer months, windows and doors should be open so that the chickens can be kept as cool as possible. The chicken house should be built so that there are no leaks in the roof. A good foundation is also necessary so that surface water will not run into the house. If the litter gets wet or damp, there is a chance for diseases to take hold.

Chicken houses should have wire over all the windows and any other openings. This will prevent hawks, owls, and other birds from flying in the house and frightening the chickens or bringing disease or parasites. If chickens become frightened, they may pack up on each other and smother to death. Wire should also be put about a foot below the foundation to prevent rats from going under the foundation.

Sound management is very important to a grower. You as a grower, should get a good strain of chickens. A good broiler chick will grow faster; therefore it can be sold sooner which means a saving in feed, labor, fuel, and more efficient use of equipment. No matter how much the chicken is fed it may not grow fast, feather well or have good market conformation. You should keep accurate records of your expenses. Each day you should check to see if there are any dead chickens. If you find any, you should make a note of the number dead and properly dispose of them. In this way you will know how many chickens you have at selling time. Another thing which should be kept as a matter of record is how much feed the chickens eat each day. As they grow older, they should consume more feed each day. If you notice a drop in feed consumption, this can be a sign that the chickens are getting sick and need treatment.

Wise feeding is very important to the success of raising chickens. When a truck load of feed is bought for your chickens you should have a feed room in which to store it. This feed room should be completely dry. If the feed gets wet, it will sour and will not be useable. The feed should not be opened until you are ready to use it. The best way to distribute the feed is to use a scoop and a bucket. You should never fill the feeders more than half full, because the chickens will waste the feed by beaking it out of the feeders into the litter. The feeders should have reels on them to prevent the chick-
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MAY 1955

* 

DAN’S

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types of Sandwiches
Good insect control is a necessity in any cotton production program, whether it is mechanized or not. The returns per acre are dependent to a large extent on the yield. This in turn is certainly dependent upon insect control. Injury by insects is serious whether a part or all of the fruit is damaged. Cotton plants stripped of part of their fruit by insects tend to divert most of the plant food into rank vegetative growth which deters yield.

It is evident that a good insect control program should include an accurate spraying or dusting schedule with such things to be considered as: concentration of poison, nozzle adjustment, pressure, kinds of poison to be used and infestation surveys to check on the poisoning program.

Good insect control is not a rocking-chair job. The county agents, insecticide and implement dealers and many others can help plan for and execute a control program at the county level. But the farmer is the only one who can make sure that the job is actually done. At the county level, it is important that the program be organized so that accurate, continuing surveys are made of cotton insect conditions. This information is especially useful in helping insecticide dealers maintain adequate stocks of materials. Overstocking can be a serious financial problem for small dealers. Most dealers understock rather than be caught with too much insecticide on hand at inventory time, and this can result in shortages that will be very costly to farmers. Surveys at the county and community level are essential. But for effective insect control at lowest cost on the individual farm, each field on each farm must be checked regularly. In general, this is a job that only the farmer or someone he hires can do.

Experience indicates that the grower's best investment in cotton insect control is "a new pair of shoes to replace those worn out in scouting." That is why so much emphasis is being placed on training the farmer in scouting procedures, and on developing commercial scouting services.

It is only within the last few years that systematic cotton insect survey procedures have come into existence. But we already have rather uniform standards for surveys, and they are carried out on a comparable basis through the Cotton Belt. The idea is to provide a continuous picture of insect infestations, area by area and state by state. This is done through a cooperative scouting program supported by USDA and the State Experiment Stations. Often, commercial entomologists are a part of the scouting program.

Survey data is useful to many persons. Extension entomologists and county agents use the information to keep their control program closely geared to shifting insect conditions. Insecticide manufacturers and dealers are able to have the right materials at the right place at the right time.

Farmers, of course, are the biggest beneficiaries of all. The survey keeps them posted on the insects currently doing damage in their respective localities; it keeps them on the lookout for these pests and helps head off damage before it occurs.

Excellent results can often be obtained when a whole community organizes itself to fight cotton insects. In a Texas community, for example, farmers and others got together and decided upon a uniform planting date, kinds of poison to use, and who would supply equipment for application. When cotton reached the four-leaf stage, the county agent met with the group on the leader's farm, and checked the insects in the fields at that time. Each week the group met on a different farm. If any farmer reported a "hot spot," everyone went to check it.

The payoff for community action was obvious by late May and June. The organized grower's cotton was far ahead of cotton in surrounding areas in size, uniformity and early fruiting. The group had the first county bale, and growers were two weeks ahead in completing their stalk destruction. A program such as this may not be practical in your county but by following recommended practices and working closely with your County Agent or Experiment Station, the same results can be obtained.

Cotton insect surveys are testimonials to the effectiveness of well-planned and executed poisoning programs. It has been found that early insect control continued through the growing season has simplified late-season control and has aided in setting the crop or the plants. In the early part of the season, sprayable insecticides are often applied when cultivating. Later in the season, and when dusts are used, they are applied as a separate operation. The effective application of insecticidal dust is restricted to those hours when little or no wind is present to cause the dust to rise or blow away, a condition that more often exists during the hours between sunset and sunrise. On the other hand,

(continued on page 20)
Switzerland - garden spot of Europe
International Farm Youth Exchange Delegate's Observation

B. S. Wiggins, Dairy '55

It is hard for us to realize that in Europe there is still a very peaceful corner amid areas of low standards of living and poverty-stricken people. An area which has not been spoiled by the hardships of war with no concern for inflation or depression, or where there is no anxiety for the welfare of the state. Here, in the midst of upheaval and worry, poverty and distrusts, we find SWITZERLAND as the rose in a bed of thorns. There is no nation in the world that is on an even keel with the United States in standards of living, soundness of currency, and economic growth, but the "Little U. S. of Europe," Switzerland. We, here in the United States, often wonder just how certain other nations live and survive under such conditions as are found in Europe. In the following paragraphs I am going to try and give you a glimpse of life in SWITZERLAND. I am limited by time and space, but nevertheless I hope you may get some idea from this writing as to what SWITZERLAND is really like.

Part of the beauty of SWITZERLAND is her very barrenness. The high mountains which form the most impressive part of the landscape mean that a considerable part of the land is bare rock, covered with ice and snow, and never to be brought under the plow. The exact figures are even startling; of the 18,950 square miles (just half the size of South Carolina) which makes up the area of SWITZERLAND, only three quarters is productive, while nearly 4000 square miles cannot be used for agriculture or for forestry. The Alpine region occupies about three-fifths of the country, the Jura Mountains 10 percent, and the modest remainder of less than one third makes up the lowlands, which are mountainous to the South Carolinians way of thinking.

It might almost be said that the beauty of this country is the cause of her poverty. If we consider mineral wealth it is absolutely true, for apart from the rocks and soil which are put to industrial uses, there are no minerals worthy of mention. The miserable small coal mines of former days were set working again only because of the emergency of World War II. This was only in the emergency and it cannot be considered a major economic factor. There is, however, one gift of nature which, in combination with modern technology, can be fully exploited, namely—water-power. More than 6,000 power stations, some 300 of them on the largest scale transforms the energy of mountain streams and rivers into electricity. This effect can be seen all over the country in that impossible to raise the public economy of the country to such a high economic level. Only a free people could attain this standard of living and only as a free state could SWITZERLAND, remote from the sea coast and without her own sources of raw materials, succeed in commanding the respect of the whole world and in taking a prominent part in world trade. We therefore every reason to regard the independence of the Swiss people as having the significance of a "staple raw material."
The Swiss are a people rooted in the soil from the standpoint of their

Dairying is widespread and very important to the farmer

There are very few houses or barns which are not electrified and also because of this abundance of power the extensive railroad system is approximately 99 percent electrically operated.

There is one vitally important raw material which cannot be overlooked and that is Liberty. The fact that SWITZERLAND, so insignificant a country from the economic standpoint should have become the home of 4.7 million people, is due entirely to intelligence and hard work. Without the peculiar political attitude of the Swiss, it would have been quite interest and population. The problem of how to support a population of 4.7 million, only three-fifths of whom can be fed on the produce of their own soil. This has made the Swiss look far afield, in trade, commerce and the economic activities in which they have proved their worth. The industrialization of the nation has had a gigantic effect upon the stability of the economy of the country. Yet the Swiss have by no means abandoned the land. Agriculture and forestry account for one fifth of the wage-earners, and together with

(continued on page 18)
LIVESTOCK JUDGING TEAM ENTERS SOUTHEASTERN COMPETITION

The Clemson Livestock Judging team entered the Southeastern Inter-collegiate Livestock Judging Contest held at Auburn, Alabama, on April 22. The team placed third in swine, sixth in sheep in competition with sixteen other Southeastern teams. The team members were James R. Hill, John Alexander, and A. H. Marshal. The team is coached by Prof. Dale Handlin of the Animal Husbandry Department.

The University of Tennessee team placed first in the entire contest. Some of the other states represented were Florida, Georgia, Kentucky, Mississippi, Louisiana, and Virginia. The contest consisted of 12 classes of livestock: 4 classes of hogs, 2 classes of sheep, and 6 classes of cattle. While on the trip the team visited the University of Georgia, Alabama Polytechnic Institute, and the North Auburn Experiment Station farms. Also a highlight of the trip was three days spent at the sixth National Hereford Congress held at Montgomery, Alabama. Here the team got acquainted with many of the outstanding Hereford breeders of the country and heard many outstanding discussions of livestock problems such as "Herd Management" and "Research on Dwarf Cattle." A demonstration of judging live animals was given and the following day the carcasses of these animals were placed according to quality, conformation and finish.


Judging team members during practice session. Left to right—Witherspoon, Prof. Hendlin, Marshall, Young, Smith, McDaniel, Bowen, Alexander, Hill.

ALUMNI NEWS

J. H. Fulmer, Horticulture '53 is now doing graduate work here at Clemson. He is majoring in Entomology and minor in Horticulture.

Dr. Ben Rogers, V. A. E. '46, received his Master's Degree at the University of Minnesota and his Ph.D. from the University of Maryland. He did outstanding work in Washington State with growth regulators on both apples and he is now at the Handcock, Maryland Field Laboratory. Dr. Rogers is originally from Roebuck, S. C.

Don Dunlap, Horticulture '54, after a year of graduate work at Virginia Polytechnic Institute is at Fort Benning, Ga.

F. B. Cates, Horticulture '55 is taking graduate work here at Clemson. Hugh S. Jenkins, Horticulture '53, after two years of service is taking graduate work here at Clemson.

Elliott T. Wooten, Poultry, February '55, is to go into the Armor Branch of the Army at Fort Knox, Kentucky.

Jimmy Henderson, former Co-Editor of the Agrarian who graduated in February, '55, is employed by the Carnation Company, Houston, Texas. He will be employed by them until he enters the Air Force, and upon completion of his active duty, he will return to the company.

Jack Moore, Dairy, January '54, has resigned his position with the Atlanta Dairy Cooperative, Atlanta, Ga., to become the assistant manager of Sumter Dairies, Sumter, S. C.

James E. Cushman, Dairy '51, has resigned his position effective June 1, 1955, as Director of the South Carolina Dairy Commission. He has purchased Shamrock Dairy, Chester, S. C., which he will manage.

V. B. Benjamenson, Dairy '52, has been promoted to Assistant to the Director of Production, Southern Dairies, Charlotte, N. C.

W. R. Bellamy, Dairy, June '53, will be discharged from the army in September and will enter Clemson as a graduate student in the Dairy Department.

Dr. E. L. Corley, Dairy '49 is on the staff of the Dairy Husbandry Department at the University of Wisconsin, Madison, Wisconsin.

Jack G. Krause, Dairy, August '52, is Assistant County Agent at Shelby, N. C.

Prof. J. T. Lazar, Dairy, '43, will receive his Ph.D. in Dairying at N. C. State in June.

James B. Pettigrew, Dairy, February '49, recently resigned from his position at Coble Dairy Cooperative, Columbia, to accept a position as manager of Paradise Ice Cream Co., Orangeburg, S. C.

Raymon D. Matews, Dairy, '52, is playing professional baseball with

THE AGRARIAN
the Greenville Spinners, Greenville, S. C. Mathews has been playing with the Pittsburgh Steelers since his graduation from Clemson.

**ALPHA ZETA ELECTS OFFICERS**

At the April 15 meeting of the South Carolina Chapter of Alpha Zeta, national honorary agricultural fraternity, election of officers was held. Ray M. Buck Jr. a rising A.H. senior from Mt. Pleasant, S. C. was elected Chancellor, Elbridge J. Wright, Jr., a rising agronomy senior from Belton, S. C., was elected Censor, Donald B. Anthony, a rising poultry senior from Travelers Rest, S. C., was elected Scribe, Watt E. Smith, II, a rising ag. engineering senior from Rowesville, S. C., was elected Treasurer, and Richard F. Elliott, Jr., a rising A.H. senior from Remini was elected Chronicler.

These officers were installed at the meeting on April 25.

**AGRONOMY CLUB NEWS**

New members were initiated into the Clemson Chapter of the American Society of Agronomy at a meeting on March 22, 1955. The new members are W. C. Brown, sophomore; L. P. Livingston, freshman; D. W. Player, freshman; D. H. Bryant, junior; R. L. Stephens, freshman; W. L. Corley, sophomore; T. R. Gerald, sophomore; and V. A. Rogers, junior.

**AGRONOMY CLASS TRIP**

Members of the Agronomy 405 Breeding class, accompanied by Dr. J. W. Jones and Dr. C. M. Jones, made a field trip to the lower part of the state on March 14 and 15. On the trip they visited the Truck Experiment Station, the Regional Vegetable Breeding Lab in Charleston, S. C., and Coker's Pedigreed Seed Co., in Hartsville, S. C. The current breeding work at these locations was observed.

**DAIRY CLUB ELECTS OFFICERS**

At the last meeting the Dairy Club elected the officers for the coming year. Bennie Wiggins was elected President, Billy Joe Bailes, Vice-president, and Daniel D. Lee, Secretary. Dr. J. T. Lazar will continue to serve as Faculty Adviser. The officers were installed immediately after the election.

On April 28, 1955, the Dairy Club held its annual picnic at Boscobel. A large crowd was present consisting of club members, Dairy faculty, Department workers, and families. Everybody enjoyed a delightful evening of entertainment and the picnic lunch.

This semester the Dairy Club has had some very interesting speakers. Dr. Graham, Associate Professor of Dairying, talked on the Development of Cheese and the Blue Cheese Project here at Clemson. Dr. Hurst, Associate Professor of Dairying, talked on the Artificial Insemination Program of Clemson. Mr. Dunkelberg, Associate Professor of Agricultural Engineering, gave a talk on his trip to Chile.

**NEW AGRARIAN STAFF ELECTED**

Members of the 1955-56 Agrarian Staff have recently been elected by the Fraternity of Alpha Zeta. Alpha Zeta is in charge of the Agrarian and the Student Adviser and Co-editors must be members of the Fraternity.

The new staff is as follows: Student Adviser, Ray M. Buck Jr.; Co-editors, Elbridge J. Wright and Donald B. Anthony; Associate Editor, Richard F. Elliott; Business Manager, Thomas E. Hayden, Jr., Departmental Editor, Bill DuBose; News Editor, Jack Langston; Feature Editor Watt E. Smith; Advertising Managers, Carl D. Lewis, J. W. Wright, and Walter Ramage; Photographer, Bennie S. Wiggins; and Circulation Manager, Earl Little.

**NEW AG. BUILDING SOON BE IN USE**

The new Agricultural Building Program is nearing completion and, according to Dr. M. D. Farrar, Dean of the School of Agriculture, will be ready for general occupancy around June 1. Lecture classes in summer school will be held in the air conditioned classrooms of the Plant and Animal Science Building. These classrooms will be open to those departments who can schedule classes through the Scheduling Committee.

The building will be ready for a general opening and dedication during Farmer's Week which will be held August 15-19. It is planned to hold a large part of the Farmer's Week programs in these buildings.

**AG. MEN WIN DANFORTH RECOGNITION**

The winners of three Danforth awards have been announced recently. Richard F. Elliott, a rising animal husbandry senior from Remini, has been named winner of the Danforth Junior Fellowship. This Fellowship consists of a two-week stay in St. Louis as well as two additional weeks at Camp Miniwanca, a leadership training camp in Michigan.

The freshman fellowship was won this year by George E. Steinbridge of Elijay, Georgia. This fellowship consists of the two weeks in Camp Miniwanca. These two awards, both the Junior and Freshman Fellowships have been awarded at Clemson for the past 20 years. These fellowships are awarded to qualified men majoring in poultry, dairying, or animal husbandry.

A new award begun this year, is the Ralston Purina Scholarship. This Scholarship consists of $500 awarded to a rising senior in either dairy, animal husbandry or poultry who has a good record in both scholarship and activities as well as showing a need. This year the scholarship has been awarded to Morgan J. Frailek a rising dairy senior from Bamberg.
JAMES R. COOK

Professor Cook received his B.S. from Texas A&M in 1939. In 1948 he received his M.S. from Iowa State College.

At the present he is teaching Feeds and Feeding, Feeds and Feeding lab, and Pork Production. He is class adviser for pre-veterinary students at Clemson.

H. P. COOPER

Dr. Cooper graduated from Clemson in 1911 in Agronomy. He continued his work in the field of agronomy, receiving his M.S. degree from the University of Wisconsin and his Ph.D. from Cornell. He has been an instructor of agronomy at Penn State College, assistant professor at Massachusetts, and instructor of field crops and later assistant professor of agronomy at Cornell.

In 1930 he became professor of agronomy at Clemson. From 1936 to 1953 he was Dean of the School of Agriculture and Director of the Experiment Station. At the present time Dr. Cooper teaches mineral nutrition and a seminar course to agronomy seniors.

He has published many scientific papers and has achieved national recognition in the field of plant nutrition.

CAREER OPPORTUNITIES

(continued from page 3)

ministered by the School of Agriculture and the School of Engineering. In addition to the four-year programs, two-year courses of study are offered in Pre-Forestry and Pre-Veterinary Medicine.

Some of the information in this article is based on a booklet, Careers Ahead, developed by the Resident Instruction Section, Division of Agriculture, Association of Land-Grant Colleges and Universities in cooperation with the National Project in Agricultural Communications. Within the next few months, the School of Agriculture will distribute copies of the booklet to interested individuals.

Anyone wishing to help defray mailing and handling costs of "THE AGRARIAN" please fill in the following and send to:

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THE AGRARIAN
How IH engineers designed a more efficient, safer, completely INDEPENDENT POWER TAKE-OFF!

The most flexible pto operation ever developed for a farm tractor is available in new McCormick® Farmall® 300 and 400 tractors, and International® W 400. Velvet-smooth control of the completely independent pto supplies convenience and safety features exclusive with IH design. For example:

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To achieve these pto safety and convenience features, IH engineers developed a planetary-gear drive and control unit. This permits the use of spring-loaded band brakes for starting and stopping the pto, thus overcoming the undesirable characteristics of a snap-action, over-center clutch.

Farmall pto is completely independent. The pto drive is direct from the engine flywheel (A) and clutch back plate, through hollow shaft (B) to first gear reduction, then to planetary gear reduction and control unit. When the pto shaft is engaged, the brake band (C) on the shaft drum is released, and the brake band (D) on the sun gear drum is applied. This causes the ring gear (E) to turn the planet pinions (F) around the sun gear, driving the pto shaft.

IH engineering teamwork produced the new, completely independent power take-off. IH research, engineering, and manufacturing men are constantly pooling time and talent to provide equipment of improved performance, making the work easier, thereby reducing operator fatigue while boosting production.
Throughout South Carolina there is an increasing problem of hardwood control in mixed timber stands. Before this area was settled the dominant cover was hardwood and the tendency to return to this type of forest cover is natural. The extensive pine stands developed through destruction of the original cover by clearing and fire after the settlers moved in. Measures for hardwood control are a reversal of natural tendencies and are difficult and also expensive. However, since the pine has proven to be the best for the purpose of timber production, and the probability of pine taking over the area.

Clear cutting of pine stands seems to be one of the chief reasons for the trend back to hardwood cover. Fire protection also aids oak and other hardwoods to increase in forest lands. Before our forests were placed under fire protection fire would run through the understory of pine forests destroying the hardwood under growth. Fire also killed the young pine seedlings so it is evident that uncontrolled fire is not the best means of hardwood control. Controlled fire, however, sometimes aids, especially when the area is burned just prior to a good seed year. Conditions must be just right for the fire to kill the hardwoods, and adequate control of the fire is expensive, since the only time when the fire will get hot enough to kill the hardwoods is when the vegetation is very dry and control most difficult.

Overthinning of pine stands lets the shorter hardwood gradually catch up with the pine. As the stand is opened, the hardwoods grow rapidly because of their extensive root systems built up during the period of suppression. The crowns of the remaining pine gradually get thicker, however, and slow the hardwoods again until the next thinning. Because of the dense undergrowth, pine seedlings cannot grow to replace the old pine, so as the mature pine is taken out, the hardwood gradually takes over. When that happens the hardwood must be destroyed completely and pine regeneration started again. If the stand is thinned correctly and kept well stocked, the hardwood is kept down, but some treatment may still be necessary.

The easiest method of killing hardwoods is by the use of heavy machinery such as bulldozers. This method is effective where the hardwood cover is very thick and there are no young pines. Bulldozing is usually expensive per acre unless carried out on large areas, but is very expensive since the ground is prepared to receive the pine seeds while the cover is removed. If a good seed year is successfully predicted and the removal is made to it, very good results can be obtained provided a sufficient number of pine seed trees are on the area. If there is no seed source, seedlings can be planted with good results. This type clearing operation carried out by the Urania Lumber Company, Urania, Louisiana cost that company approximately seven dollars per acre.

Another control method, which is usually cheaper, is the use of chemicals applied in frills or sprayed. One recommended chemical is Ammate, another is 2,4,5-T. Ammate is mixed with water or applied in the crystal form and 2,4,5-T may be mixed with oil or water. These chemicals may be applied on frills cut around the trunk of the tree through the bark or in notches cut at the base of the trunk. Gums and oaks are best controlled by frilling, and hickories and beech by spraying the base of the trunk. Trees over twelve inches in diameter may be girdled without poisoning since they do not tend to sprout. Poisoning costs about four dollars per acre. However when the chemicals are sprayed on the cost is higher. One disadvantage of chemical treatment is that the ground is not prepared to receive the pine seed. Therefore it is often necessary to plant seedling unless there are already seedlings growing.

At the present time experiments are being carried out at several experiment stations, including that located at Clemson College, to determine the success of chemical control, and also the cost of it and the returns to be expected in the production of better forests. Since increasing profits from forest lands is a primary purpose of hardwood control, the cash returns are being given much attention.

A pamphlet has already been issued by the Clemson College Extension Service entitled Controlling Southern Hardwoods (circular 385). In this pamphlet may be found methods recommended for use on different type forest areas for best results.
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Ray M. Buck, Owner

MAY 1955
Realizing that a fishpond is for recreation and pleasure and not as a source of anxiety and worry, a person may save himself many headaches with the proper selection of a fishpond site. The perfect fishpond site does not exist, yet the best site available can be made better and a good site may be improved upon. The proper selection of the farm fishpond site will decide whether the future management of the fishpond will be accomplished with difficulty or with ease.

The permanent resource of the fishpond is the water that is impounded. A rapid exchange of water in a fishpond is not favorable for fish culture because in the natural state water is seldom in its most productive form. It is therefore important to select a site in which excessive amounts of water both floodwater from heavy rain and the regular flow can be avoided or can be managed. A pond should not be built

plied anywhere: enough water to keep the pond from drying up or to maintain the right level all the time without any water flowing out.

When there is a spring or other source of live-water capable of supplying the pond, a large drainage area is not needed. Three to five acres for a one-acre pond will be sufficient.

Without a live water supply, a pond builder should avoid sites which have watersheds more than twenty-five times the surface acreage of the pond. A ratio of ten to one, or even less, is much more desirable. Some good fishponds depend on rain alone with a watershed that is only twice as large as the pond. It takes a good heavy soil to allow this.

It is much easier to select a fishpond site today than it was in former years, thanks to the new types of earthmoving machinery. These machines make it possible to have ponds in places that it was once

Farms ponds can be used for recreation, conservation and food production.

upon any site unless its condition comes within the limits of practical management.

The fishpond that is to be managed efficiently must be of a size—when related to the rains and the ordinary flow from its watershed—to keep the management safe, dependable and commercial. Or the excess water must be diverted around the pond. A few principals can be applied.

thought impractical, such as along the sides of valleys or in places where long dams or dikes are necessary. From a standpoint of land terrain, the most desirable pond site is a little valley with gradually sloping floors. These gradually sloping floors make it possible to impound a sizable area of water with a dam of moderate height. The steep side of the pond eliminates shallow

water areas that are undesirable.

The desired depth for the best fishpond lies between three and twelve feet. Water that is three feet deep will grow practically as much food as deeper water. No shallow water areas less than eighteen inches deep are needed. They grow too many weeds, protect the small and intermediate fish too well, and don't produce enough fish food. In South Carolina a depth of six feet is ample enough for the deepest part of a pond. Greater depths are not objectionable beyond the added cost of higher dams.

In the selection of a pond site, not only the above ground features of the pond must be taken into consideration, but the soil beneath the pond must be considered. The soil must be able to hold water, or it must be capable of being made to do so during construction of the pond. This is a problem that should be referred to a soil and water conservation technician unless the pond builder has had sufficient experience in this type of problem.

Theoretically, lands with good clay subsoils will hold water. Though each have their exceptions, deep sands or rocky sites will allow excessive seepage. Preventive measures should be taken during the construction of the pond and not afterward. Two preventive methods are recommended. There are: (1) the building of a seepage core and (2) placing a layer of clay materials all over the pond basin.

To build a seepage core, a trench about four feet wide should be dug along the centerline of the dam site down to soil that is reasonably impervious. The trench should then be filled with the best clay material that is available. The core of clay should be built up several feet into the dam itself.

The second method is a relatively new one. It can be used where there is a good source of clay available nearby and the clay seepage core method is impractical. The size of the pond basin and the cost of place-
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* 

CLEMSON MEN ALWAYS WELCOME

SWITZERLAND
(continued from page 9)

their dependents they make up one fourth of the population. Moreover, if we consider the proportion of urban to rural population, the great decentralization of urban elements, the absence of big towns and industrial regions with purely urban settlements, we shall not go far wrong in inferring a strong attachment to the land even on the part of such groups as are not actively engaged in agriculture. A comparison with other countries brings to light the interesting fact that in SWITZERLAND, after Belgium and England, the highest employment figures for trade and industry, live in communities of 10,000 inhabitants or less, that is, in rural settlements.

Let's go just a little deeper into the agricultural situation and examine the farmer, or peasant as he is referred to there, who occupies one of the highest positions of respect. Large estates are entirely unknown in Switzerland. The holdings are medium-sized to small, mostly small. By actual census definition the average farm consists of only 7.5 acres but for all practical purposes an average of 12.5 acres is accepted by agricultural leaders of the country. It is hard for us to comprehend that on such small acreages that the production is very high, especially when we consider the fact that the soil is reasonably poor. Too, with very little commercial fertilizer used in SWITZERLAND, the averages of production are extremely high. In the place of commercial fertilizers the Swiss practice a very thorough and capable means of fertilization, and that is the use of farm manures. As all other materials in the country, not a drop of liquid manure or compost is wasted. By the conservation of this by-product the yields are upped tremendously.

The following is a breakdown of the various uses of the Swiss soil:

<table>
<thead>
<tr>
<th>Use</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unproductive area</td>
<td>2,303.007</td>
</tr>
<tr>
<td>Alpine grazings (mountain pastures)</td>
<td>2,519.229</td>
</tr>
<tr>
<td>Woodland</td>
<td>2,494.678</td>
</tr>
<tr>
<td>Agricultural land (arable soil)</td>
<td>2,885.884</td>
</tr>
</tbody>
</table>

From this you can see that the uses of the soil is very limited and depends to a great extent upon topo-
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The curved top of a round bale sheds showers like an umbrella. Here is the answer to one of the biggest crop losses in farming — wet and weathered hay.

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SWITZERLAND
(continued from page 18)

graphical characteristics as to the extent it is used. In the first classification you find the extreme mountainous area, which is unknown to any region in the U. S., and as far as agriculture is concerned is completely useless. The Alpine grazings are the areas which you could compare to our Smoky Mountains and are utilized only six months out of the year. Here, the cattle are kept during the summer for the purpose of cheese-making or butter manufacture. The woodlands are high on the list of important economic factors because of the limited amount which they possess. All timber is harvested according to strict conservation regulations, which are very powerful if abused. The arable land area is just a little over one-fourth of the total and because of its importance is put to its best uses at all times. Never is there a foot wasted, never is it abused, nor very little of it is allowed to lay bare.

The cattle in SWITZERLAND are vitally important to the farmer because a great deal of his income is obtained from them along with a sizeable amount of satisfaction. Aside from milk, the cattle are vitally important for meat and in some areas for beast of burden. All of the Swiss breeds are primarily bred as triple-purpose animals. As a citation to the importance of cattle, in 1947 livestock accounted for 66.1 percent of the gross farm return, with cattle returning the largest amount.

The crops in the general agricultural area are not too different from those we plant here in South Carolina. With the exception of corn and oats, the crops are about the same, with more emphasis being placed on wheat and potatoes. The weather is quite favorable for generalized and diversified farming with an average precipitation of about 5 inches per year, however, the rain is not as seasonal as ours and is distributed over the entire twelve months.

A factor which I think is very important in SWITZERLAND as far as the farmer and his well-being is concerned is the co-operative movement. There has been a steady expansion of co-operative and associative thinking on the part of the Swiss farmers. They seem to be of one mind when it comes to the Swiss farmers. They seem to be of one mind when it comes to the desire for education, expert knowledge and progress on a businesslike and commercial basis. As testimony to this vast movement consider the fact that there are in SWITZERLAND at present 17,369 agricultural associations of varying sizes. Examples of some of the associations or co-operatives are the ones for poultry farmers, bee-keeping, rabbit-breeding and goat-breeding.

With hard work, which keeps the farmer busy from five in the morning until eight at night for 360 days of the year, the Swiss farmer has taken meager resources and equipment and produced one of the highest levels of living known in the world today. He has applied methods and his intelligence along with his brawn to give to the world an example that laziness is a word that should never have been concocted for use of the human race. As a summation of the country of Switzerland and to its citizens, particularly the Swiss Farmers, let me give you in a nutshell what SWITZERLAND is really like. The ordinary Swiss watch, for which they are famous, is made of raw materials and resources imported from other countries. The price of the watch, that is what we would pay for it in a store, includes 3 percent which was paid for the raw materials. The remaining 97 percent accounts for SWISS SKILL, SWISS LABOR, and SWISS INTELLIGENCE. Ninety-seven percent skill, labor, and intelligence to me is about as good an example of SWITZERLAND as I know of... That is, accomplishment to the highest degree.

FARM POND SITE
(continued from page 16)

ing the clay are two of the major factors to consider before using this method.

If given a choice between two sites, one covered with trees and the other site clear, by all means take the clear site. The expense of cutting the trees and clearing the site are saved. If, however, the better site of the two is the forested area, add the cost of clearing the site before you decide to build. Low cut stumps can be left behind if necessary, but the pond will be better off if the trees are pulled out and no stumps are left at all.

INSECT CONTROL
(continued from page 8)

sprays may be applied during most of the working hours, since they can be successfully applied in winds up to 12 m.p.h. Spray materials should not be applied when the foliage is so wet that water is dripping from the leaves.

The number of nozzles per row will depend on the stage of plant development. For early-season control, one nozzle per row will give adequate control; whereas, in midseason, three or more nozzles will be necessary, depending on the size of the plants. When three nozzles are used, one is mounted directly above the plants, and one on each side of the plants. If additional nozzles are required to give coverage, they are mounted between the rows.

One of the chief problems in late-season application of insecticides is the mechanical damage to the cotton by ground machines. Some of this damage can be eliminated by proper shielding of the tractor wheels. Satisfactory shields may be made from an old discarded steel drum. The drum is cut in half and a section used to shield each rear wheel. The method of attaching depending on the make of the tractor. Plans for attaching to the more common makes of tractors may be secured from your local county agent.

When a new agricultural chemical comes on the market, you can usually figure that it has cost some private company well over a million dollars worth of research to develop.

In an average year, the chemical industry spends at least nine million dollars on research to find new or improved materials for use by farmers.

The research expenditures are motivated, of course, by the desire to make a profit. American business derives its great drive from this incentive. But profit is geared to output, and output depends on what the public will buy. In short, as work is done for profit, the chemical industry is necessarily obliged to work for the public as well. With this in mind, you can readily see that the insecticide industry is not working for profit alone but also for the advancement of American agriculture. Poison regularly and remember when you do, that you are insuring your UNDERGROUND INVESTMENT with ABOVEGROUND PROTECTION.
MAYBE it's true that Buster here doesn't know table d'hote from a la carte, but don't let that fool you. He really knows his "vittles," as anyone who has tossed a shank over a pasture fence can tell you.

Fact is, in his own four-footed world Buster ranks as quite the gourmet, and he's been known to get downright fussy at times. That's why those who know him best—cattlemen, that is—have come up with some pretty tasty recipes to satisfy his boyish appetite—to help him grow into a stout, healthy young fellow that will make a good impression on "graduation day," when Buster is shrewdly judged in terms of steak.

And because feeding Buster has become such a science, often special machinery is required—like the new John Deere Grassland Drill, which is making such a hit with livestock growers. You see, the John Deere Grassland Drill makes it possible to establish and improve range and grassland and keep Buster supplied with the wholesome, nutritious food he likes and needs.

Buster, of course, generously pays back such treatment in more pounds of better beef—all because he doesn't have to take the "potluck" fare of poor pasture.

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