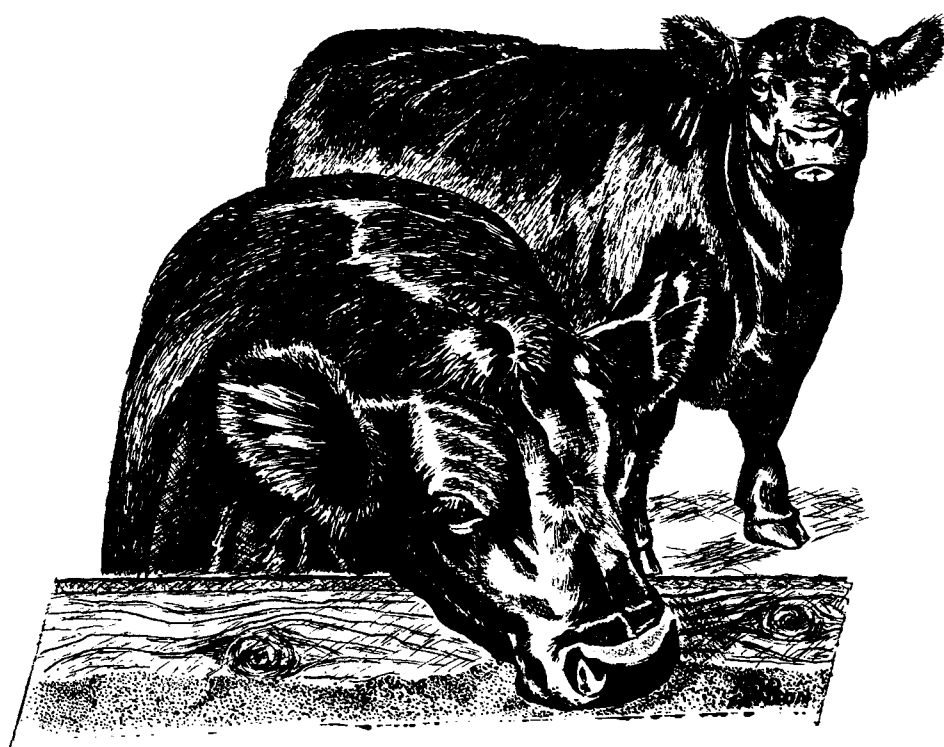


Howdy

a brief look at

A.C. AGRICULTURE



Big Sandy, Texas

WELCOME TO THE A. C. RANCH

The Ambassador College Agriculture Department was established in 1965. As a part of the College, its motto is "Recapture true values." The Ranch stresses character development and education; pioneering from the ground up. Before we tell you more of our story we wish you a hearty WELCOME and hope you'll tour the Ranch and farm - noting much is still in the developing potential stage.

The Ranch operates on a total of 2500 acres of which 240 acres are in cultivation. The remaining area is pasture and timber land. These acres are all being utilized for experimentation and for providing meat, dairy and vegetable produce for our local College and for the Ambassador College in Pasadena, California.

Special work is being done in the two main areas of soils and plants. We feel certain basic and natural principles in the agriculture field have been lost, overlooked or ignored. In soils we are working to restore varying types of soils to natural fertility and to maintain this fertility by improvement of the ecology of soil micro-biology.

The work under study with plants consists of their ecology in relationship to their economic value. In this study we are not stressing monetary value over a short period of time, but including their value to soil tillage and fertility and to animal life.

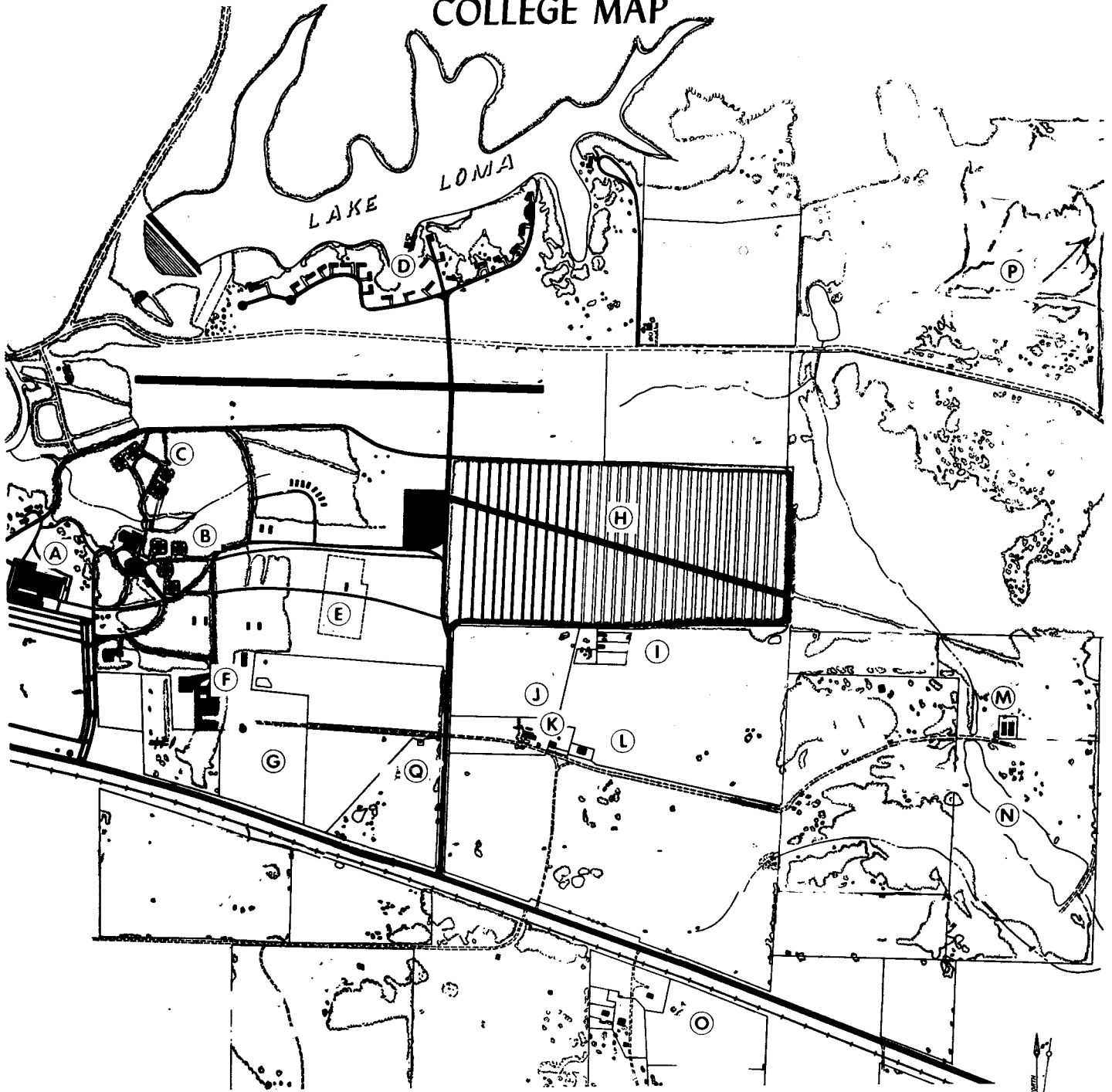
Work being done in our beef program includes disease prevention and health maintenance through proper natural nutrition. Careful selective breeding is being done to improve beef quality and quantity. Emphasis is also being placed on breeding for a high ratio of feed conversion from feed most economical and available to this area.

We feel more attention should be given to promoting the inter-relationship and inter-dependency of the agricultural fields to produce healthy human lives.

Our main enterprises consist of: Beef fattening and beef breeding, Broilers and laying flocks, Field crops, Soils and pastures, Dairy, Sheep, Goats, Turkeys, Horses, Silage and haylage, Greenhouse work, Natural fertilizers and Insect control.

Visitors are welcome to see the operation and to receive information they feel would be helpful to them.

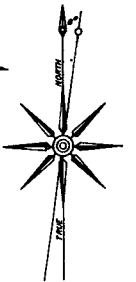
COLLEGE MAP



- Legend -

- (A) Field House
- (B) Women's Dorms
- (C) Men's Dorms
- (D) Faculty Row
- (E) Booth City
- (F) Transportation
- (G) Garden
- (H) Pine Grove

- (I) Poultry Area
- (J) Experimental Plot
- (K) Warehouse, Bins, & Grinder
- (L) Feed Lots & Harvestore
- (M) Greenhouses
- (N) Ranch Recreation Lake
- (O) Location of Sheep, Goats & Turkeys
- (P) Follow Road to Dairy Location
- (Q) Stable Area



For Your Information

- Beef Over 400 beef cattle are regularly maintained on the Ranch. They include Angus, Hereford, and Scottish Highlander. Of special interest will be the new blue Smith Harvestore Silo containing much of the feed to fatten the cattle in the feed lot.
- Dairy A Jersey herd is raised to supply milk for the College.
- Crops In addition to the many pasture grasses raised and harvested, various field crops grown include milo, winter and spring wheat, oats, soybeans, rye, barley and corn.
- Fertilizer Fertilizer is prepared at our own warehouse. It includes diatomaceous earth (KMP) and a mined "organic" material. Our laboratory cultures soil bacteria which is added to our fertilizer for the purpose of helping to restore soil life.
- Food Processing This area receives the raw products produced on the Ranch. It packages and freezes beef and garden vegetables for use by the Ambassador Colleges and faculties here and in Pasadena, California.
- Garden Over 26 different vegetables are grown in the garden. Many of these vegetables are stored in the College fruit cellar and the freezing unit for later use in the dining hall.
- Goats A small herd of Angora goats is kept on our place.
- Greenhouse Two greenhouses specialize in growing fresh, vine ripened tomatoes the year round - again utilized by the College.
- Horses Most of the 12 horses are in the stables and pasture near Highway 80.
- Poultry The Ranch poultry enterprise consists of layers and broilers as well as replacement stock. The breeds include White Rock, white and brown Leghorns.
- Sheep Dorset and Delano Marino sheep are the two types of sheep we have on the A.C. Ranch.
- Turkeys One of the most beautiful sights on the Ranch are the 12 Royal Palm turkeys.

AMBASSADOR COLLEGE

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Big Sandy, Texas 75755

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DIATOMACEOUS EARTH

Diatoms are microscopic, single-cell algae. The majority are exceedingly minute and one with a length of 1/200 inch is well beyond the medium size. They are known to occur in both fresh and sea water.

Both in fresh and sea water there are great numbers of free-floating diatoms which at times make up the main bulk of the minute sea life. The type that we use are fossil diatoms. The siliceous skeleton wall that remains after the death of the diatom has formed deposits generally a few feet in thickness. Most of these deposits were formed during the Noachian Flood.

Several fine deposits of this material have been made available to us with arrangements to procure as much as needed. We are using it at Ambassador College and feel it is very useful and helpful.

The industrial uses of diatomaceous earth are varied. It is used as insulation of boilers, refining of sugar, and in filtration processes. The oldest and best-known commercial use is that of a very mild abrasive in metal silver polish and toothpaste. It is also commonly used in paints and face powders. The amount used in polishes has increased greatly in recent years with diatomaceous dust as the base of silicon polishes for automobiles. One recent discovery is to use this material as a glaze for covering all types of pottery, especially the better grades.

As an insecticide, diatomaceous earth at Ambassador College is used as a means of protecting seeds against insects in grain storage (grain weevils), to destroy chicken lice, blue bugs, cattle lice, flies and ticks. It can be used for dusting fruit trees for various insects, for controlling tree bores in pine trees, and many insects in garden crops. The material gets its "killing" power as an insecticide by two methods: 1) Insects, worms, etc., breathe through the pores of their skin. The dust is so fine that it simply plugs these pores which causes the insect to suffocate, dehydrate, and die; 2) Fossil diatoms, when finely ground, have an abrasive action. Most insects and bugs have jointed appendages. When the material is applied, it enters these joints and dismembers them by the abrasive (cutting) action.

Diatomaceous earth is not poisonous and can be used on the soil as a fertilizer. Over a million tons are used annually in the United States alone. This material has great importance in agriculture as an insect repellent, a fertilizer, and moisture control in grain storage.

Application

There are three major ways natural diatomaceous earth (KMP) is used at Ambassador College:

1. As a fertilizer it can be applied on fields at the rate of 300 to 500 pounds per acre depending on how acid the soil is. It is high in phosphate, potash and has some nitrogen.
2. You may use it on all types of lice, ticks, blue bugs, and many kinds of worms and other insects as an insecticide. If used as a dust, it must be kept in a very dry place. It can be applied as a dust at the rate of 20 to 30 pounds per acre or as a spray using 20 to 25 pounds in 100 gallons of water. For best results, it is essential that the material be finely ground.
3. It is also very helpful in controlling moisture and insects in grain storage. Simply apply as the grain is being put into the storage bin at about seven pounds (KMP) per ton of grain.

When spraying this material as a fertilizer or an insecticide, be sure that the sprayer has a good agitator in it because the powder tends to settle out. KMP dust can be used in all types of orchards and groves, on fields, and gardens.

When KMP is used as an insecticide, applied in the dust forms, there is a problem of getting it to stick to the insect and the plant. Usually this problem occurs when the dust is not completely dry. There are instruments available on the market which produce an electrical negative charge which causes the material to stick and cling. Everything about us has a positive charge so the negative charge produces a magnetic effect. This instrument can easily be mounted on field or hand dusters. Brand names and availability may be provided if desired.

On the market, diatomaceous earth costs over twenty cents per pound. We can make it available from the Texas College at three cents per pound. This will just cover costs. It may be picked up at the college or we can ship it by rail or truck if the individual pays freight charges.

KMP

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YEAST FOR BACTERIA GROWTH

The Use of Non-debittered Brewer's Yeast in Soil Bacteria Reproduction

Natural yeast contains many enzymes and unidentified vitamins needed by living things. This starter yeast is made by fermentation of waste sulfite liquor from paper pulp.

The yeast becomes a non-debittered Brewer's yeast after it has fermented grain (converted sugar or sugar derived from starch into alcohol by the many enzymes of yeast). This yeast, filtered from beer or ale after fermentation, is high in protein (about 50%). It is filled with unidentified vitamins and enzymes which remain very active.

In drying or debittering the yeast it is commonly heated sufficiently (pasteurized) to kill the yeast cells and destroy the fermenting power so it may be used as a food supplement. Without this debittering or pasteurization process fermentation might be produced in the digestive tract, causing severe indigestion if used as a food.

De-bittered yeast is the commonly purchased dried Brewer's yeast which has had the life taken out of it. Some types cause a bitter flavor and so they are killed by heat. Often it is also fortified with vitamins. Because the heating process kills the life, it will not work in rapid reproduction of your bacteria culture for lack of the needed enzymes. Therefore, only non-debittered Brewer's yeast works!

Why are these enzymes important? These enzymes are produced by the yeast, and released for the feeding of bacteria. Not only does the bacteria feed on these enzymes, but it thrives and reproduces dozens of times more rapidly on the fermentation products these yeast cells cause. The

enzymes of yeast convert the sugar or molasses you put into your bacteria mixture into alcohol. They change an organic substance like sugar into a more simple substance the bacteria can directly use. The sugars are oxidized to CO₂ by the bacteria, causing bubbles to rise, a gassy fermentation, and a foul odor. This is one way you can tell if your bacteria is alive. Be encouraged and realize your bacteria is almost ready for application when bubbles rise, cloudy or gassy fermentation takes place and there is an offensive odor.

For best results from a properly fed culture, you must use an active non-de-bittered Brewer's yeast. It helps food become available in the right amounts for use by the bacteria. Man does not yet understand all that is involved.

Where can you get it? Non-de-bittered Brewer's yeast can be ordered from: St. Louis Brewer's Yeast Corp.; P.O. Box 65; St. Louis, Missouri 63119.

Cost? The smallest amount available is 50 pounds at 30¢ per pound. Amounts of 100 pounds and larger are presently 15¢ per pound (you pay the freight in both cases). If you would like smaller amounts of yeast, you may order from: Ambassador College; Agriculture Department; Big Sandy, Texas 75755. A donation of 30¢ per pound will help defray costs.

AGRICULTURE DEPARTMENT

NBY

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GROWING YOUR BACTERIA CULTURE

1) How can I tell if my bacteria is alive?

A scientific way to check if bacteria is alive is to put it under the microscope. Since you probably don't have a microscope, try the following test:

- 1) Put a drop on a glass slide. If the droplet has some body to it and doesn't spread out flat, it is probably teeming with bacteria. (You may compare it with a regular drop of water.)
- 2) After the mixture has set from 30 hours to a week (depending on the temperature), bubbles will rise. This is a sign of life.
- 3) If the mixture is cloudy, it is a good sign of life.
- 4) An offensive odor is also a sign of life.

We have completed several tests trying to find out how long bacteria would live in the package in which it is sent out. After twelve weeks in a hot, dry place, the bacteria was still alive and active. Though the material was very dry, when water was added to it the bacteria was fine.

2) When should the bacteria be applied?

Any time is fine to apply the bacteria. When the ground is moist is the best time, and it is better if it can be disced into the soil. However, we have applied it with good results on crops, especially wheat and oats, after it was several inches high.

3) How may I keep bacteria alive throughout the winter months?

Some keep an active culture of it in their basement by covering it to prevent freezing. If you do not need an active culture for application to plants or indoor gardens, you might keep a small source in your freezer. It will keep if frozen

according to limited experiments conducted here at the College. You need not be concerned about the condition of the bacteria outdoors as it becomes dormant during the winter months.

4) What about containers for bacteria?

Metal barrels might harm the bacteria, and the bacteria will eat holes in the barrel in a very short period of time. We put bacteria in a galvanized metal tank and within three months the tank had been eaten through. Maybe you won't have this problem, because of a different type water. Our water here is a little on the acid side and this contributed to the problem.

Those who haven't been able to locate a wooden barrel have had satisfactory results by purchasing a concrete tile and putting a bottom in it. In areas where they make sewage tile or septic tanks you can get a tile very reasonable and by setting it on the ground and pouring a little concrete in the bottom this makes an excellent tank. This way you can regulate whichever size you need for the amount you want to use on your land.

Some have asked how a cardboard barrel sprayed with plastic or a new polyethylene plastic liner would effect bacteria. We have not used a container of this type; however, we feel that the container should be satisfactory.

Note: It would be best to make a starter gallon and save some back, just to make sure you have good bacteria if one type of barrel does not work.

If you adhere to the above guidelines and carefully follow the directions accompanying the bacteria instructions, you should be able to reproduce your own culture with no problem.

Bac-2

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" O R G A N I C "

S O I L C O N D I T I O N E R

Builds and Conditions the Soil

Natural organic matter is one of the three basic soil constituents. A shortage or lack results in a decrease in living organisms, an unbalanced or "locked up" soil. More organic material in your soil results in more life, health and fertility. Organic matter is the only source of food supply for micro-life. In healthy soil it coats each particle of rock and mineral. It is the main key to life in the soil.

In supporting soil bacteria and micro-life, organic matter aids in the bringing of insoluble soil minerals into solution. It also increases the water-holding capacity of the soil, absorbing more than one hundred times its own weight in water. This moisture is then retained for future use and released to the plant as needed.

Other values of "Organic" include improving aeration and the physical condition of the soil, regulating soil temperature, reducing erosion and serving as an important source of nitrogen and plant food elements, increasing productivity.

Most soils continue to lose their organic matter because of false and improper agricultural practices. Fertilizer does have a definite good or bad effect on bacteria, earthworms and other forms of life. Care must be taken so one does not destroy but rather feeds and sustains the life in the soil. You can't get too much organic matter in the soil!

How can you get more organic matter in your soil? By using proper tillage methods, plant legumes, cover (green manure) crops. Keep something growing on your land at all times and apply organic matter (manure, etc.) whenever it is available. It takes thousands of pounds of plant matter and much time to make a few hundred pounds of composted organic matter. The organic soil conditioner makes available concentrated

organic matter which starts working as soon as it is applied to the soil. This natural soil conditioner also contains a rich supply of minerals. It is 75% organic and 25% mineral.

Though the bulk of the conditioner is raw concentrated organic matter, it contains many trace minerals and elements. These minerals though minor in volume, are major in importance. They affect the health of plant, animal and man, and are essential for proper soil balance.

Briefly, to skim the importance of these trace minerals and their function, they are needed to make the elements available in the soil to produce rich, healthy crops. They affect the production of protein, proper reproduction, photosynthesis, health and strength as well as normal growth.

Some of these trace elements found in "Organic" are:

Aluminum	Germanium	Silica
Barium	Iron	Silicon
Bismuth	Lead	Silver
Cobalt	Magnesium	Sodium
Calcium	Manganese	Strontium
Carbon	Molybdenum	Sulphur
Chlorine	Nickel	Titanium
Chromium	Nitrogen	Vanadium
Copper	Potassium	Zirconium
	Gallium	

This material is an excellent plant food for field crops, gardens, trees, house plants, and shrubs.

"Organic" is being made available through the Agriculture Department, Big Sandy. Ten lb. bags can be ordered by mail for \$1.50 per bag, plus freight. Large quantities are available FOB our warehouse.

ORG

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BACTERIA--HOW THEY HELP PLANTS GROW

Bacteria are a minute form of life that live in the soil. They, along with millions of other living organisms such as fungi, algae, and protozoa, make up the life in the soil.

Each particle of soil under our feet is a little world of its own. Over each particle's surface is a thin film of water, teeming with many types of microbes. Bacteria are one of the smallest forms of these micro-organisms. They are so small and complex that science still has a great deal to learn about them.

Although little is known about their anatomy, much is known about their effect on all living things. Bacteria fall into several major classes with hundreds of varieties in each class. The ones with which we are concerned fall into three major groups which are: cellulose bacteria, nitrogen-fixing bacteria, and scripto bacteria.

The job of cellulose bacteria is to decompose the plant remains which litter the soil. They turn stems, leaves, roots, and virtually all vegetable matter into humus, decomposing or decaying organic material. As the cellulose bacteria decompose the plant matter, they liberate nitrogen and minerals, thus enriching the soil.

Nitrogen-fixing bacteria live throughout the upper layers of the soil. They fix nitrogen from the air and various plant and animal residues in the soil.

Scripto bacteria are disease fighting. They produce antibiotics to combat fungus diseases, nematodes, root rot, and insects.

These three basic types of bacteria are included in the package you may request. They are very important in unlocking the minerals and nutrients already in the soil. A soil may be high in various elements; however, without life, without soil bacteria, a limited amount and number of the elements can be utilized by the plants. Basic soil bacteria will help you have a balanced soil that will supply your crops with proper nutrients--and fight off disease and insects.

The Care and Use of Bacteria

Instructions upon receiving one pound of bacteria material:

1. Add material to one gallon of water.
2. Add one pint (or about 3/4 lb.) of non-debittered Brewer's yeast.
3. Add one-half pint (one lb.) of sugar or molasses (this feeds the bacteria and causes it to multiply).

Care

1. Let mixture set about four days at 70° Fahrenheit. It reproduces most rapidly at 70°, but will not die at another temperature.
2. After four days add this to 50 gallons of water. (Use a wooden or cement container.)
3. Also add five pounds non-debittered Brewer's yeast and five pounds of sugar or molasses.
4. Let mixture set until bubbles begin rising. After 30 hours or longer (can be up to 7 days) depending upon the temperature, it is ready for application. The bacteria should be refed in three weeks if not used. You can save a gallon if you wish to begin a new batch. Also, you can make larger quantities at one time. The above is simply a feeding guide.

Application

Bacteria may be used in fields at the rate of 20 to 30 gallons per acre with a regular sprayer (garden rates - ½ gallon per square yard). It is helpful to then disc it in. On pasture land apply when soil is wet or apply more gallons of water to the mixture per acre. It may also be applied by letting it drip into irrigation water as it is being applied in the field.

Water varies in different areas in regard to acid and alkaline content. The bacteria will die in highly acid conditions. We have found diatomaceous earth acts as a buffer to help control the pH or acid balance. If you have trouble keeping your culture alive, we would recommend that you add one-half pound of diatomaceous earth to 10 gallons of water.

The bacteria can also be used on gardens, shrubbery, flowers, and lawn--applied with a sprinkling can or small hand sprayer. Be sure your sprayer is clean and free of insecticides. If in doubt about it being clean, baking soda and warm water solution is very effective and will clean the sprayer. Agitate this solution in your sprayer about 15 minutes. Then drain out completely and the sprayer is ready for use.

To help cover the cost of starter bacteria, you may contribute \$1.50 per package. Soil bacteria represents only one facet in maintaining a balanced and living soil, but it is one of the basics for right agriculture.

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Agriculture Department

Big Sandy, Texas 75755

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F E R T I L E M I X

A Natural, Organic Soil Conditioner
Mineral Fertilizer with Soil Organisms

"Fertile Mix" contains soil building products such as high organic mineral, natural diatomaceous earth and soil bacteria. It is a well-balanced, blended soil conditioner impregnated with new soil bacteria. These natural substances are nature's helps to restoring fertility in depleted and "locked up" soil; which are described in the following paragraphs.

"Organic" soil conditioner contains approximately 75% concentrated organic matter. It starts working as soon as it is applied to the soil by feeding the living organisms and supporting the bacteria that makes plant food available. The many tons of nitrogen in the air are obtained through the fixation of nitrogen in the soil by certain bacteria. Because this mineral compost feeds the soil bacteria, it makes available nitrogen.

Minerals needed in the soil include many trace elements that are sometimes present only in microscopic amounts, but are vital to plant growth. The so-called minor or trace elements may be minor in volume, but they have a major importance in their effects upon the health of animal or man. While a few elements are needed in varying amounts to produce rich crops, still trace elements are needed to make those elements available to plants.

Some of the trace elements found in high organic mineral soil conditioner are:

Iron	Calcium	Lead	Nitrogen
Copper	Sodium	Silica	Vanadium
Nickel	Gallium	Cobalt	Germanium
Potassium	Magnesium	Sulfur	Carbon
Aluminum	Chlorine	Chromium	Molybdenum
Titanium	Zirconium	Bismuth	Strontium

Diatomaceous earth contains many of the essential elements required in the soil for plant growth. This material is a natural deposit of fertilizer that nature placed in one of its reservoirs, so it would be available for transporting to depleted soils everywhere. The very nature of diatomaceous earth is to serve as a normalizer and supply plant food. It helps unlock other essential elements of the soil, encourages better soil life, and is generally the protector of the soil. It stimulates root growth. It is longer lasting than synthetic substitutes and will not burn plants. It builds soil and soil texture.

What is soil bacteria? In order to complete the cycle of life in the soil; the uniting of ions; transporting elements to their proper place; nature requires the help of literally millions of microbic workers. These helpers are the bacteria and can be termed the life-giving factor of soil.

Good life productive soil has millions and millions of living organisms in every cubic inch. These living organisms (nature's workers) are truly the life of the soil and organic matter is their only source of food supply. Without these living organisms dead plants will not rot, minerals will not dissolve, no nitrogen is fixed and the glues to build soil structure are not produced.

Soil bacteria has proved most effective in ridding crops of nematodes and is also effective in combating other diseases and insects of the soil.

To help you restore vital organic and humus matter, unlock your soil, "Fertile Mix" is available to be picked up in large quantities from the Agricultural Warehouse at Ambassador College, Big Sandy, Texas, for \$4.00 per hundred weight. It is quite costly to send it by motor freight; however, if you desire, it can be sent FOB.

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REVITALIZE SOIL

A N D

USE TEST RESULTS

To heal sick soil and bring it back into profitable production of high quality, health-sustaining crops, it is necessary to stop using the farming practices which have caused the trouble, and begin farming in accord and harmony with the natural laws God has set in motion. There is always the question, "Where to begin?"

A step should be taken to determine as much as possible where your soil presently stands, so a plan of action can be formulated. A soil test will give a guideline to the available N-P-K (nitrogen, phosphate, potash) and the pH level. As mentioned before, organic matter is the key to soil balance. This should always be increased. A soil test will help tell you what is "locked up".

For example, if the soil is too acid, organic matter and ground limestone will bring it back into the growing range so soil organisms can multiply rapidly and begin to work efficiently.

Soils low in phosphorus or potash may need an application of ground rock phosphate or potash rock. Since one application of these minerals lasts for a number of years, in most cases the soil organisms will begin to liberate sufficient supplies from the earth itself so further applications will not be needed.

Nitrogen-fixing bacteria live in nodules on the roots of legume plants such as clover, peas, peanuts, soybeans, cowpeas, vetch, and alfalfa. These bacteria are capable of adding as much as 200 pounds of nitrogen to an acre of soil each year.

Nitrogen can also be added by applying manure and compost. Most nitrogen of plant and animal remains is locked up and must be liberated by the living bacteria. Still other forms of nitrogen-fixing bacteria make nitrogen available to a plant directly from the air.

To help speed up the rejuvenation of soil, it may be advisable to spray a culture of soil bacteria on the fields. This is especially helpful if a farmer does not have enough compost to spread on the land to supply the bacteria. A culture of soil bacteria can be grown in a tank and sprayed on the field at a rate of 30 to 50 gallons per acre. We have used a bacteria culture on our farm in Texas with excellent results. However, you need to have some organic matter for the bacteria to work on. The bacteria culture is not itself a fertilizer. It only activates the soil. (Information on this culture is available on request.)

General Table of Fertilizer Application

I. Guide to balancing the pH level. (Rate per acre)

Limestone	1 ton <u>brings up</u> the pH level 1 point
"Organic"	250 lbs. <u>brings up</u> the pH level 1 point
KMP	200 lbs. <u>brings up</u> the pH level 1 point
Gypsum	1 ton <u>lowers</u> the pH level 1 point
Liquid Sulfur	5 gal. <u>lowers</u> the pH level 1 point

II. Source of Nitrogen Supply.

Green Manure Crop -- Disc in clover, or alfalfa, or rye, or beans, etc.

or	Approx. rate per acre	Garden rate per sq. yd.
	Medium to High 100 lb.	1/4 lb.
"Organic"	Medium 200 lb.	1/2 lb.
	Medium to Low 300 lb.	3/4 lb.
	Low 400 lb.	1 lb.

III. Source of Phosphorus

Rock Phosphate

	Medium to High 200 lb.	1/2 lb.
	Medium 300 lb.	3/4 lb.
	Medium to Low 400 lb.	1 lb.
or <u>KMP</u>	Low 200 lb.	1 1/4 lb.

IV. Source of Potash

Natural Muriate of Potash

	Medium to High 80 lb.	1/8 lb.
	Medium 120 lb.	1/4 lb.
	Medium to Low 160 lb.	1/2 lb.
or <u>KMP</u>	Low 200 lb.	3/4 lb.

V. Source of Major and Minor Elements

Bacteria (key to unlock soil)

20-30 gal.	1/2 gal.
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Fertile Mix contains sources of N-P-K and soil bacteria. It is a blended "organic", "KMP", and bacteria fertilizer.

Medium to High 300 lb.	3/4 lb.
Medium 400 lb.	1 lb.
Medium to Low 500 lb.	1 1/4 lb.
Low 600 lb.	1 1/2 lb.

In summary, to restore soil balance and maintain your proper pH level, you need organic matter. When soil is not producing properly and its minerals are locked up because of soil imbalance, more organic matter and living organisms are needed.

If you have further questions regarding specific soil test results, please feel free to write again.

STR

SOIL INFORMATION SHEET

To aid in interpreting the soil test and making recommendations, fill in the following information sheet, and submit with your soil samples. Each soil sample should be marked with your name and sample number which should correspond with the information furnished on this sheet. See mailing instructions on opposite side under Step 3.

NAME _____ DATE _____

ADDRESS _____

CITY _____ STATE _____

A. SOIL CONDITIONS: (Use ditto and check marks wherever possible.)

Laboratory No. (Do not write in this space.)	Your Sample No. (Field)	Acres in Sample	Upland	Location		Irrigated		Soil Type (if known)	Remarks
				Bottom	Second Bottom				

B. CROPS TO BE GROWN

C. CROPPING HISTORY

Sample Number	Next 2 Crops				Last 2 Crops					
	Next Crop 19__		Year after 19__		Present or Last Crop 19__				Previous Crop 19__	
	Crop	Desired Yield	Crop	Desired Yield	Crop	Yield	Fertilizer		Crop	Yield
							Grade	Lb/A		

D. GENERAL: (Please answer following questions if applicable to these samples.)

1. Will small grain be grazed? No__ Yes__ Which fields? _____
2. Has lime been applied during past two years? Which fields? _____
3. Will grass be used for hay? No__ Yes__ Which fields? _____
4. Will grass be used for grazing? No__ Yes__ Which fields? _____
5. If grazed, how many animal units per acre? _____
6. Will a legume be grown in pasture? No__ Yes__ Which fields? _____
7. What is the primary pasture grass? _____

PROCEDURE FOR TAKING SOIL SAMPLES

Soil tests can be only as accurate as the samples on which they are made. Proper collection of soil samples is extremely important. Chemical tests of poorly-taken samples may actually be misleading.

- Step 1. Take one soil sample from each uniform area of 10 to 40 acres in a field. In areas such as east Texas, one sample should represent only 8 to 12 acres; whereas, in areas such as the Coast Prairie, where some soils are more uniform, one sample can represent up to 40 acres. The sample should be taken from over all the area. This can be done by taking a small amount of soil from 10 to 15 different places. Place these in a clean container (bucket, paper sack, etc.), mix thoroughly, and take out approximately 1 pint for the composite sample. Avoid sampling unusual areas such as slight field depressions and small eroded areas.
- Step 2. When taking the small samples use a small spade. Scrape the litter from the surface. (For pasture, sample to a depth of 4 inches.) To use a spade, dig a V-shaped hole and take a 1/2 inch slice of soil from the smooth side of the hole. Repeat in 10 to 15 different places.
- Step 3. Fill out completely the information sheet on the opposite side. Enclose together with the soil testing fee in a stamped envelope and attach to the outside of package containing samples so that both will reach the laboratory together. Address the letter and package to:

Soil Testing
Ambassador College Agriculture Dept.
Big Sandy, Texas 75755

\$1.50 will cover costs.

(NOTE: All these steps apply to a garden on a smaller scale.)

PRECAUTIONS

1. Avoid sampling spots in the field such as small gullies, slight field depressions, terrace waterways and unusual spots.
2. When sampling fertilized fields, avoid sampling directly in fertilized band.
3. Do not use old vegetable cans, tobacco cans, match boxes, etc., to submit samples.
4. Do not use heat to dry samples.
5. Be sure to keep a record for yourself as to the area represented by each sample.
6. Be sure sample numbers on the boxes correspond with sample number on the information sheet.

AMBASSADOR COLLEGE

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AC RANCH

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MILKING ON THE SABBATH

Milking on the Sabbath is a question and problem we have had to face here in Texas. After a period of experimenting, we have quit milking from sundown Friday to sundown Saturday. So, far, it has been practical and beneficial.

Overall, the animal health has improved. There has been a slight increase in milk production. We have little to no mastitis problems now, whereas, we had some because of lack of cleanliness and substandard mechanical handling in conjunction with resting the cows on the Sabbath. I am sure all this together has produced the result we are getting. (Of course if you lack faith you have lost before beginning.) The cause of every mastitis case that has appeared since we have begun this program has been traced to mechanical malfunction or a wrong handling practice.

Here is an outline of what we do:

We feed regularly throughout the week until Friday. At noon on Friday we lock the cows in a dry lot (water o.k.) away from any feed except dry hay. We milk Friday evening before the Sabbath giving them one half ration in the manger before the Sabbath, letting it simply lie there until the cows are turned out around noon on Saturday. If your feed (other than that fed during the milking period) is pasture, simply open the gate to the pasture. All we do on the Sabbath is open a gate.

We milk then again Saturday evening after the Sabbath and again begin giving the cows a full ration of feed at this milking period.

This procedure is working fine here, however, we are still experimenting. The decision of following it is entirely up to the individual. If you decide to go ahead with it, we would appreciate hearing your results. Please feel free to write us if you have further questions.

AGRICULTURE DEPARTMENT

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OUR FRIEND, THE EARTHWORM

Few creatures equal the burrowing earthworm as a necessity to better health and greater growth to plant and vegetable life. The earthworm indirectly is of utmost importance to man.

The burrowing earthworm is nature's own plow, his chemist, his cultivator, his fertilizer, his distributor of plant food. The earthworm surpasses anything man has yet invented to plow, to cultivate or to fertilize the soil.

Some 2,500 species of earthworms have been described by zoologists, ranging from microscopic in size to monsters in South America and Australia that grow to seven feet long and more than an inch in diameter.

All are "headless," eyeless and toothless. There are no external antennae or feelers. From end to end the body is composed of ring-like segments.

The earthworm's internal system is highly complicated. In a comparative sense, the earthworm's system does to the soil what the modern refinery does to crude oil.

The earthworm has a multiple system of hearts, minute tubes circling that part of the alimentary canal between the pharynx and the crop. Through a complicated system, these hearts supply blood to all parts of the body.

Minus lungs, the earthworm "breathes" through its moist epidermis or outer skin. His blood corpuscles are colorless and float to the surface of each segment where they absorb the oxygen.

The earthworm is bisexual, that is, it contains both male and female organs of procreation. However, this doesn't mean that the earthworm can go through life and reproduce his kind without need for contact with others of his species, for the worm cannot fertilize its own eggs. Mating occurs at night in warm moist weather. Two worms, leaving the tips of their tails in their own burrows, stretch out and find one another in the dark and exchange masses of sperm. This isn't done in a few seconds. The worms secrete a slime covering over themselves and remain in one another's embrace for two or three hours.

Earthworm eggs hatch in about twenty-one days. The new worm appears as a short bit of whitish thread about a quarter of an inch in length. Within twelve to twenty-four hours, their color darkens. Once hatched, it is a case of each worm for itself.

Certain species of earthworms, particularly those that come to the surface and crawl during wet or rainy weather, are active at night. Other species are active throughout most of the day and night.

The earthworm literally eats its way through the soil, except when it is highly porous. Having no teeth, everything before it, if not too large to swallow, is sucked into its mouth.

Every piece of soil and decayed vegetable and animal matter taken in by the earthworm passes through its digestive system, which is equipped with a gizzard-like organ. Here the food value in the swallowed matter is extracted for use by the worm. The balance is carried by muscular action down through and out of the alimentary canal. These waste materials are called "castings." Worm castings are the feces (manure) of earthworms. They tend to be more neutral than the parent soil, whether acid or alkaline, thus causing the earthworm to be a soil balancer. They are also much richer in nitrates, organic matter, total and exchangeable calcium, exchangeable potassium and magnesium and available phosphorous than the soil from which they were made. These creatures work tons of rich material into the soil every year.

Depositing castings is only a fraction of the good that earthworms do. They pull organic matter, such as dead leaves, down under the soil, and by their digestive juices break it down into a form usable to the plants.

Their burrows go down to eight feet or more below the surface, and they bring up rich minerals that plants need. The burrows improve aeration of the soil, permit the penetration of surface water, and help facilitate the downward growth of roots.

In the soil where the earthworms live, plant and vegetable life prospers. Earthworms are nature's own means of soil building and conditioning. The earthworm by its constant eating, pulverizing what it eats, and excreting it as castings, prepares the soil so that its mineral and chemical quantities are more easily absorbed by the tender roots of plants. The result is that we have a healthier plant, richer in chlorophyll; more fertile, healthier seeds; rapid, even growth; and if it is an edible plant, richer in food elements.

These advantages are the natural outgrowth of the burrowing earthworm. Nitrogen is much higher in the earthworm castings than in the native soil. Nitrogen is the first fertilizing principle to become depleted. But with earthworms functioning in the soil, nitrogen content is increased and will continue to remain as long as there are enough earthworms burrowing in the soil.

To the animal we have been pleased to call "lowly," God apparently assigned one of the mightiest tasks in the world--the task of keeping the surface of the earth forever renewed; the task of forever converting back into topsoil--humus--every bit of waste matter left over by man and beast, as well as every bit of dead vegetation, so that the earth might stay pure and able to support the life that God intends and keep the soil ever in a condition of health, wealth, and perfect harmony.

Of course the earthworm was given helpers to carry out his vast job. Helpers in the form of billions upon billions of tiny micro-organic creatures who do miraculous preliminary work. But the earthworm seems to be the chief executive, the co-ordinator, the homogenizer, and the final deodorizer, purifier and vitalizer of the waste. Not until it has been swallowed, digested, and excreted by him in particles that break down to the size of finely-ground black pepper, has the waste matter actually become earth again.

It was this stupendous assignment that man thought he could perform with man-made substitutes, evolved in the laboratories--lifeless substitutes which were supposed to maintain the life of the soil. No wonder we have come to such a mess soilwise and foodwise.

Commercial fertilizers used today have killed the earthworm and our soil does not have them. Lack of organic matter deep within, hence we have no earthworms.

You can't improve upon nature. Therefore, if we accept the earthworm as an important part of nature--as our friend, a natural friend--it behooves us to do our part to help and encourage the earthworm to do its part.

This is your new, perfect earth, made by nature's perfect earthmaker, the earthworm. Cherish it!

WRM

AMBASSADOR COLLEGE

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YOUR POULTRY PROGRAM

Today poultry farming has gone berserk. Actually some poultry farms are not even classified as farms but appropriately named factories. Why? Because they treat the chicken as a machine and not an animal. The chicken is debeaked, decomed, dewinged, and declawed. It is shot full of vaccines, antibiotics, hormones, and other medicated food additives. It is put in a cage with water and feed passing by. It never experiences the taste of green grass or a fat juicy bug or worm.

Is this the only way you can raise broilers or produce eggs profitably? Is there a simple, natural way for poultry production?

The establishment of a poultry program should begin with an understanding of the natural laws involved. Basically they pertain to the selection and breeding of the birds, nutrition, sanitation and management practices.

Modern breeding programs are oriented towards high production in unnatural conditions and depend upon the technological developments in medicine and nutrition for their success. The basis of the poultry flock should be the selection of the natural variety or varieties in the pure lines of birds best adapted to your area and suited to your purpose. It is rather difficult to find pure lines, so once a flock is established it would be desirable to raise your own replacements by selecting the best hens for brooding purposes and continually culling the poor producers and those lacking hardiness and resistance. Unfortunately crossbreeding programs are being used to gain hybrid "vigor" in place of selecting and mating for quality, resistance and production in the pure lines. (See Lev. 19:19)

New stock to be added to the poultry flock should be isolated from the flock for about two weeks to make sure they do not have any disease or show symptoms of disease infection.

In mating birds of the light or egg breeds, such as Leghorns, generally one male is used for fifteen to twenty hens.

In the general purpose breeds, such as White Rocks, one male with ten to fifteen hens is a better ratio. We are presently running one rooster for every ten hens in our layer flocks.

Once you have obtained your chickens, how should you take care of them? First they must be fed. The best poultry rations can be the simplest if the feeds are grown "organically" on a fertile soil and if the birds are provided with tender green pasture or fresh greens daily along with adequate sunshine. Sunshine provides vitamin D and green forage is high in the essential vitamins, minerals and high quality proteins required by poultry. In addition the bugs, insects and earthworms picked up provide protein and other "unknown factors" in the diet. A good pasture program will greatly reduce feed cost and help to maintain a healthy flock. Pastures should be rotated and tilled occasionally to prevent buildup of parasite and disease problems.

Pasture alone will not provide sufficient energy (calorie) and protein needs for optimum growth and production. The simplest manner of supplying the extra energy and protein is to provide "free choice" grain (whole grains are more palatable than finely ground ones) and protein supplement. This will allow the birds to balance their own ration. Grit should be made available if birds are not on pasture. Laying hens generally need extra calcium which can be provided by high calcium limestone or oyster shell.

When good quality organically grown feeds and forage are not available it will be necessary to provide special supplements of animal proteins, vitamins, and minerals in order to prevent poor growth and production and disease problems. While we are striving for a simple and balanced feeding program we find it necessary to compensate for present deficiencies by adding some supplements to the basic ration. We formulate our rations by:

1. Determining the availability and cost of feeds in our area.
2. Following guidelines in Morrison's Feeds and Feeding.
3. Actual experience with our flocks.

The College Ranch has its own feed mill for mixing rations. At present we are only able to grow a portion of our own feeds. When feeds must be purchased we suggest you use feeds not contaminated with antibiotics, hormones or other medications and use the natural supplements when they are needed.

Fresh clean water should be available at all times. We have found it helpful in our program to add a small amount of

vinegar as a purifier in the water and as an aid in digestion.

Another very important point of care is sanitation. The poultry house should be cleaned preferably once a month or more often if needed. At each cleaning the building can be disinfected with a washing of hot lye water or another method is whitewashing several times a year. This will not only free the house of lice, mites, and disease germs, but gives the building a clean, fresh fragrance. After cleaning, the house should be bedded down with clean, dry bedding such as straw, sawdust, or corn cobs--whatever is available in your area. A good deep litter is very essential. Ground corn cobs are excellent absorbing litter. The feet and claws of poultry are made for scratching and their beaks for pecking. Throwing "scratch" grain on top of the bedding daily provides the need for scratching and pecking--giving the poultry much needed exercise to help maintain healthy bodies.

Problems with external parasites such as flies, lice, mites, ticks, fleas, bed bugs, chiggers, etc., can be overcome by good sanitation and dusting procedures. Lime sulfur or cresol spray can be used in houses and on roosts. Dusting with woodashes, diatomaceous earth or finely powdered sulfur directly on the birds, in the nests or in a scratch box will protect the birds.

Part of sanitation is providing adequate ventilation and area. The floor space that should be provided per bird will depend on such factors as type of floor, size of bird, temperature and ventilation. Crowded conditions cause birds to develop habits such as picking, feather eating, and cannibalism which are apt to result in poor growth, poor feed conversion and poor laying, as well as possible disease outbreaks. General recommendations vary from one square foot per bird for broilers to four square feet for the larger general purpose type hens. For ample roost space, allow eight inches for each bird. Laying hens need about one nest to every four birds or community-type nests can be used if preferred. If hens lay eggs on the floor or in feeders, it may be that you have too much light in the nest. Make the nest as enclosed and dark as possible.

Several poultry farmers try to increase egg production by leaving lights on all night. This is a means of "forcing" the chicken. We feel it should not be done. If God had intended poultry to see at night, He would have created them with cat eyes. Poultry's digestive tract usually completes its duty before the night is over, giving the system a time to rest. By leaving the lights on, the chicken will eat all night and its body will wear out in less than half the time it should. We have had hens still producing after five years.

Management is the overall key to successful poultry production. Planning the whole program with the right goals in mind is the first step. Secondly, common sense, securing the right knowledge and experience will prepare a manager to achieve the planned goals. It is not possible to give all the particulars needed for a successful poultry program in a letter. Much useful information can be obtained through your County Extension Agent, books and USDA publications, and experienced farmers.

A final point of success has to do with following the basic principles in selection, nutrition and management. Hard work and being a conscientious husbandman are essential aspects of a good manager. God promises to help those who will do things His way.

PLT

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I N S E C T I C I D E S

Insecticides affect all life on earth. Back in the 1900's natural methods of controlling certain types of insects were used. This was primarily done with sulphate and pyrethrum (taken from the dried center of certain flowers, mainly chrysanthemums). Nicotine from tobacco and rotenone (from a legume plant of East India) were also used. These were a mild form of insecticide, yet did a very good job. After World War II, man began to use synthetic insecticides which delivered a much faster kill. In 1965 alone man used 900,000,000 pounds of these deadly synthetic (chemical) insecticides.

A form of arsenic was the first chemical insecticide. As insects became immuned and the kill lessened, more deadly poisons were introduced and became available on the open market. These fall into two main groups: 1) chlorinated hydrocarbons, of which DDT is one. 2) organic phosphorus. DDT was put on the market in the early 1940's. A German chemist developed it in 1939 and won a Nobel prize for this "great" achievement.

DDT has been used widely on every crop we grow. It is taken into the blood stream from the foods we eat, the liquids we drink and the air we breathe. This is done in most cases in quantities as small as 1/10 of 1 part per million, and soon builds up to 15 parts per million. This poison is stored up in the fatty tissue of the body and as it continues to build, causes a degenerative disease of the liver and other body organs. Tests show that men who work in DDT plants have accumulated as high as 648 parts per million. It is easy to understand why they are short-lived. DDT has infected our grain crops, hay crops, poultry and livestock feeds--even the milk we drink daily.

Then came chlordane, a little more deadly. In a 25 parts per million solution, one drop on the skin will cause poisoning and sometimes immediate death. Heptachlor came next, soon followed by epoxide, which is four times stronger than chlordane.

Next came the hydrocarbons. They included del-drin, aldrin, and endrin. In solution they are 40 times more powerful than DDT. These are the insecticides that do such a fine job of killing birds, fish, and other wildlife.

The thions are being pushed as some of the best insecticides now available. Malathion and parathion are the most popular. One drop of parathion on the skin brings sudden death.

There is little wonder that our soil is dying, most of the life killed by poisons.

A visit with a bio-chemist who works for a large chemical company proved quite revealing. He mentioned that we had almost reached the limit concerning the effectiveness of poisons to kill insects. He said that over the years, the strength of the poisons has had to be increased to be effective. The insecticides developed would kill all but a few of the insects. Those not destroyed began to multiply at a much more rapid pace than before because there was no competition and more food. He went on to state there was only one stronger poison that could be used, and at only one-half part per million. If the solution were made any stronger, it would kill humans as quickly as insects. He did not say this, but it is easy to conclude that if for no other reason, man would be completely destroyed from insecticide or insect infestation in the near future.

The insects are only trying to do the job for which they were created--to destroy weak and sickly plants. Insecticides cause insects of necessity to mutate and become stronger in order to do their job. The poisons from insecticides are left in the soil which destroys soil life. The weakened soil produces weak and sickly plants which summon more insects, more and stronger insecticides are applied, and the drastic cycle continues.

Many people go right on ignoring facts and closing their eyes to them. "Educated society" has no solution.

ANSWER AVAILABLE

Healthy, living soil produces healthy plants with a built-in insect repellent. Certain spray or dust can be used while the soil is being enriched. We have found KMP (Diatomaceous Earth Insecticide) to be effective as a dry dust or mixed with water as a spray. The items mentioned earlier are quite helpful. Much can also be accomplished by introducing a natural enemy to the insects that are trying to be eradicated. (Rachel Carson's book, Silent Spring, offers helpful guidelines.)

Diatomaceous earth is not poisonous in any way. In fact, we use it in our livestock and poultry mineral. Neither will insects killed by KMP harm birds when the insect is eaten. Well, if it is not harmful to warm-blooded animals, and it doesn't poison the insect, just how does it work?

To understand the lethal effect on insects, we must first know a little about the insect. Most insects' shelter consists of a hard shell. Around the joints and spiracles insects secrete a liquid. What the KMP does is dehydrate the insect. It absorbs the moisture around the insect's joints, and demobilizes the insect. Being unable to move around to obtain food the insect dies. When the KMP is put under a microscope it looks like tiny pieces of glass. With this quality it cuts and severs the insect's skeleton shell. Once the shell is broken, liquid leaks out. With loss of only 10% of its liquid, an insect will die. Therefore, the insect is killed in two ways without poisoning it.

Another advantage of harmless insecticides over chemical insecticides is that insects cannot build a resistance to it. You will not have to add a stronger dose each time.

Diatomaceous earth does kill almost any kind of insect. There are some it does not. Don't conclude that KMP is a solution to all problems. Don't deem it as a panacea. Man did not create this element, he merely discovered it.

KMP works best when applied as a dust -- administered through an electro-static duster. "Perma Guard" is also a diatomaceous earth product and may be attainable in your area.

Through natural methods we can better keep God's agricultural laws. Remember, God has the power to rebuke the devourer.

"And I will rebuke the devourer for your sakes, and he shall not destroy the fruits of your ground, neither shall your vine cast her fruit before the time in the field, saith the Lord of Host" (Mal. 3:11).

INS

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SOURCES OF INFORMATION

The following books along with our article, "The Truth About Chemical Farming," will help you become familiar with the principles of natural farming.

The Soil and Health by Sir Albert Howard describes organic agricultural experiments on several continents in the first half of this century. He presents thoroughly documented information and was knighted by the English monarch for his agricultural research. The book is published by the Deven-Adair Company, 23 East 26 Street, New York. Another excellent book by the same author is An Agricultural Testament published by the Oxford University Press.

The Living Soil by Lady Eve Balfour describes the experiments of many top agricultural scientists showing the relationship between the organisms of the soil and health of crops and man. It is also published by Deven-Adair.

A very comprehensive 900 page book on raising fruits and vegetables is: How to Grow Vegetables and Fruits by the Organic Method, published by the Rodale Press, Emmaus, Pa. This is the best book we have seen on this subject and the cost is about \$7.00. The Complete Book of Composting with over 1000 pages of information on methods of making compost successfully, is also available from the same publisher at the same price.

A book which shows the fertility chain in soil, a blueprint for soil management, the dynamic natural laws which rule the land giving man his food is Farming with Nature by Joseph A. Cocannouer published by the University of Oklahoma Press, Norman, Oklahoma.

Books describing actual experiences and large acreage and tillage and fertilization practices of two famous English organic farmers are: Modern Humus Farming by Friend Sykes and Fertility Farming by Newman Turner. Both are published by Faber and Faber limited, 24 Russell Square, London W.C.L.

Make Friends With Your Land by Leonard Wickenden, a professional chemist who approaches soil, animal, and human health from a chemist's scientific viewpoint. Mr. Wickenden, in a very readable, easily understood style covers many aspects of soil health, including a very good chapter on composting, available in many libraries, and in stores for about \$3.00.

A book on tillage practices, but now out of print and available only in some used-book stores, is: Plowman's Folly by Edward H. Faulkner. Good public libraries should have at least some of these books. Anyone in the business of farming and who can afford the reasonable cost will find these books worth buying.

A magazine on natural farming is Mother Earth, the Journal of the Soil Association. This is the best technical journal on organic agriculture we know of. It is available for \$10 per year. It is somewhat technical and hard to understand. Quarterly, New Bells Farm, Haughley, Suffolk, England.

Two American publications we find helpful are: Organic Gardening and Farming, by the Rodale Press, Emmaus, Pa., at a subscription rate of \$5 per year, and Natural Foods and Farming by Natural Foods Associates, Atlanta, Texas, at the same rate.

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