

THE FARM OF THE FUTURE
compiled by Dee Finney

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2-4-06 - DREAM: I was sitting at my computer, looking at a list of links. I decided to play with the list and eliminated links until I had a list where the letters lined up perfectly on a diagonal until they spelled:

m
o
t
h
e
r

I thought that was a clever way to remember my mother who had passed away last year.

I decided I would read a book. I had lots of books I hadn't had time to read yet.

I went down the stairs to my library to pick out a book and I heard this preacher coming down the hallway, yelling, "Jesus Saves! Jesus Saves!" I didn't want to hear him or have to speak to him. He had nothing practical to say that would save me.

So I went up to the attic to get a book that my mother had left me and decided to read from that one because it was a thick old book and I didn't have time to read much these days.

When I got back downstairs with the book, there was a young couple who had gone to the hospital and returned with a new baby girl. We had been babysitting their two older children who were just old enough to ride bicycles - around 3 and 4 years old - a boy and a girl.

They now planned to move to Florida.

I was riding in the car with them as they prepared to go to Florida and their two older children rode their bicycles alongside the car on a narrow path that ran next to the road. I knew they'd never get to Florida because they would hit their own kids with the car when their kids lost their balance on the bicycles.

The young man decided he would rest on the sofa before they left on their trip, so I sat next to him on the sofa to read my book, which I hadn't yet had

time to start. I just stuck my thumb into the book at random and began to read - it was rather near the end.

Instead of closing his eyes and resting, he kept staring into my eyes. He had brilliantly blue eyes and they were distracting me from reading my book.

I told him I was trying to read, but he kept staring into my eyes.

All of a sudden, he grabbed the book away from me and put it behind him. He smiled and continued to stare into my eyes - never blinking.

I said, "Hey! I was trying to read my mother's book!" I had to wrestle with him to get my mother's book back.

When I finally got my mother's book back, he had lost my place and I said to him, "You lost my place in the book, now I have to start over from the beginning."

I opened the book from the front and discovered that the book was about running a farm the old-fashioned way - with horses pulling plow - not using gasoline run tractors. This was from way back in the olden days. It looked fascinating and now I wanted to know how they lived with no electricity and no gasoline.

An Old Fashioned Farm

By Delmar E. Wilson

On my parents' farm in Benton County, Iowa, in the 1920s and 30s, we raised cattle, hogs, chickens, and sometimes sheep. We also raised a few colts since horses pulled our carriages, our machines, wagons, and hay racks. The machines included a walking plow; two two-bottom, fourteen-inch plows with seats requiring five or six horses each; a disc with a seat using four horses; a harrow with a cart with a seat using four horses; a clod chopper for occasional use; a two-row corn planter; a ten-foot seeder for oats and clover and timothy seeding; and four one-row corn plows.

We needed two hay racks and four grain wagons with high sides and higher band boards for picking eared corn. At home we had two cribs and two elevators driven by horses. We drove into the barn with wagons of oats and shoveled the oats off into a large bin for horse feed. The hay racks were unloaded with a large fork and a rope over pulleys drawn up by a horse—Daisey or Harley—ridden by one of the younger children.

Our work would generally be considered fun since we exercised and were strong and healthy. We worked together, ate together and played together. At one time, all seven children went to

school on the bus, which was a model T truck with a special transmission and an exhaust pipe running down the center of the bus, boards on each side to rest our feet and keep us warm.

In extreme weather, snow or mud, we used a sled or a wagon and a spirited team of horses. In cold weather, our feet in the sled were warmed by slabs, with soap stones heated in the oven, plus many blankets and horse blankets, and many clothes, some made by our parents, and handed down from older child to younger child, with necessary alterations by my mother.

We think we ate well. Much of our food was fresh. Mother's garden had many varieties of food such as lettuce, radishes, onions, peas, beans, tomatoes, cucumbers, squash and watermelon. With many welcome hands and numerous pails it was irrigated when necessary. We filled a tile with water to irrigate the cucumbers. Water came from a stock tank and was handed over a fence. We had a small push-weeder as well as numerous hoes and rakes. For potatoes we borrowed a machine to plant the cut-up potatoes, as well as one to dig them. We moved the large potato patch, as well as items in the variety garden, yearly. We used no herbicide or insecticide with few exceptions. Our apple and cherry orchard was sprayed with a smelly ingredient.

With our large family and hired men at meals, we often needed plates for twelve or thirteen. We butchered steers and hogs on the farm. Much of it was cooked and put in jars. One time we canned 100 roosters. My father cured ham and bacon in large barrel-size crocks. I believe some items were covered with boiling lard and kept in the basement.

Our meals would always include meat, or sometimes canned salmon. Salmon was plentiful before the dams were built on the other rivers. We had a huge bin of potatoes, perhaps sixty bushels, in the cool area of the basement, and many shelves of jars containing peas, beans, pickles, corn, applesauce, berries, cherries. You can see we had pies and cakes. Most of our bread was home baked. We had graham, or rye graham, as well as white. We bought the rye and graham at the local elevator where it was ground, and the white flour from the store in Dysart. It came in fifty pound sacks. Auntie Em baked a large assortment of bread and rolls, including some with frosting.

During much of the season our food was fresh from our garden. We supplemented our butchering with fresh meat from the local butcher, "Oysters Meat Market." We purchased it on a daily basis and kept it in an ice refrigerator. Sometimes we helped a neighbor fill his ice house from a large creek and we could secure some of that ice in return or buy it. Naturally we had our own eggs, which we used, and we traded the excess for groceries. We used a mixture of feed for the chickens.

We used self-feeders with ground oats, linseed or cottonseed meal, and tankage or meat scraps, exactly what I've forgotten. With shelled corn tossed in their litter late afternoon to scratch for, chickens roamed the farmstead. There was a high fence bordering the house yard in one area.

Mother hatched the eggs with a "cluck" hen and used little metal individual houses for the hen to raise about a dozen chicks. The hen could use her house in a storm or at night. She identified with her house and called her chickens, "cluck, cluck."

We sold cream from our dairy cows, and fed the skim milk to the hogs, sometimes letting it sour in barrels with added water and ground feed to make a slop. We had fresh milk twice daily, with no pasteurization. It was filtered through a fine screen in a funnel and cooled in the basement if we had no ice, and no refrigerator. We disliked the taste of pasteurized and homogenized milk. We used a Guernsey cow's milk to have more cream. We ate all our cereal with cream, and had cream for coffee or desserts, as well. Our whipped cream was delicious. We served it for company meals. Of course, we made our own butter.

Dad arose first each morning at 4:30 and soon called up the stairs. We men and boys followed shortly to our appointed tasks—one on the pony to bring in the milk cows and horses, another bringing the clean milk pails, about six. Then we all milked while Dad fed the sows and horses, and then headed to the hog house. Others fed the fat cattle, harnessed the horse, etc. Then we carried the milk to the house basement and separated the cream. Soon after we would eat a breakfast of oatmeal or cream of wheat, pancakes, eggs, bacon or sausage, toast, corn syrup, and butter, milk and coffee. Everybody including children drank coffee if they wanted.

We had a bull on the farm and our protection and herding was aided by a black snake (bull whip) reaching about 15 feet. We could snap flies off the barn wall with it. Actually our bulls were tame and good natured, sometimes tied-up and led to water twice daily. But they were never to be trusted.

We were careful, maybe lucky, to avoid serious injuries. One time the hay fork came loose at the barn roof and came down, splitting the straw hat brim of my brother Jim and lodging in the hay rack floor.

We had the runaways of the horses, sometimes lasting to the next fence, or to home, but we had no injuries. My Dad and Uncle Dave bought horses in the West, broke some and resold some for profit. Dad used a "w" on the horses' legs with which he could pull the rope and stop the horse in training. He would then hitch it with one or two other horses and it would soon learn the signals. We loved and respected our horses. Our pony "Pet" walked very slowly when a small child was on her back, and stopped if they started to slip off—bareback of course.

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<http://www.westonaprice.org/farming/oldfashionedfarm.html>



1864 The first Amish family arrives in Knox County

"The Amish have traditionally maintained a scale of farming that enabled each farm to be worked by a family. Few farms have more than eighty tillable acres, which is about the maximum a father and son can easily work. If more help becomes available the operation may be expanded to include more livestock or possibly specialty crops such as vegetables. Rarely are more acres added."

David Kline, 1990

Many of the Amish brought with them the farming skills passed down by their ancestors who founded their Swiss Anabaptist heritage in Switzerland and Germany nearly three-hundred years ago. In order to keep their religious, family and community values, the Amish have chosen to do without some of the technology that other farmers use. For instance, they often use horses to plant and plow their fields instead of tractors and combines. Many Amish also avoid using pesticides. Instead, many Amish farmers use manure to fertilize the land. They also use [crop rotation](#) to keep the soil healthy. The Amish work to combine their knowledge of science, technology and experience to maintain their traditional way of farming. This type of farming benefits the families and the community.

CROP ROTATION

Now that you've bought new land you need to design your own rotation. A crop rotation is a multiple year plan for what crops you will grow in a particular field. A rotation means that you will plant different crops in the same field. Continuous cropping or monoculture is different from rotation because you plant the same crop in a field year after year. A rotation is especially important because certain crops add nutrients to the [soil](#) and other crops take nutrients from the soil. A common rotation plan is to follow corn with soybeans, then winter rye, then hay, then again to corn. As a farmer you must understand the different ways in which your crops impact the soil so that you can keep your soil healthy and productive. Read about [grasses and legumes](#) in rotations and then return to plan your own rotation!

Often farmers plan a fallow period for their fields, or in other words, give the fields a vacation from producing crops. One way in which to renew soil nutrients is to allow livestock to graze in old fields. In these



pastures the animals' manure will decompose and replenish the soil so that it can continue to support crops. View the [layout](#) of your farm.

FROM: <http://www2.kenyon.edu/Projects/Farmschool/types/crops1.htm>

"What crops are grown on an Amish farm?"

"Main crops raised by Amish in Lancaster County, in order of acreage, are corn, hay, wheat, tobacco, soybeans, barley, potatoes, and other vegetables. Farmers also grow various grasses for grazing. Corn, grain, and hay crops usually stay on the farm for feeding livestock. Tobacco, potatoes, some grain and hay plus vegetables are raised for marketing. Farming is done with horse-drawn equipment with metal wheels (no rubber tires.)"

Organic Farming

Organic farmers are different from conventional farmers because they choose not to use any [chemicals](#) on their farm. This means that they never spray their fields with pesticides or spread any kind of chemical fertilizers. This also means that they never give their animals any non-organic feed or give their animals any drug past a certain age. For a farmer to be able to sell his product as certified organic in Ohio, the soil must have been chemical-free for at least four years. However, it varies from state to state. While in California your soil only has to be chemical-free for one year in some states it may have to be chemical-free for ten! Each organic farmer has his own reasons for choosing to farm organic. Some farmers do it because they feel that it is cheaper to farm organic. They don't have to pay for the chemicals, they get higher prices for their products and they can use a [crop rotation](#) to produce the same kind of crop yields. Other farmers do it because they feel that they are producing a healthier product. Most farmers choose to farm organic for a combination of those reasons and others.

FROM: <http://www2.kenyon.edu/Projects/Farmschool/nature/organic.htm>

Importance of Sustainability in Eco-Farms

Modern farming consumes more energy than it produces, but an eco-farm will produce its own: Little Ash Eco-Farm supplies its own energy from wind, solar power and wood. On the eco-farm, hedges and woodland can be managed to produce biomass. Plants such as sunflowers can supply biofuel, and animals provide biogas. Water can be recycled and rain water harvested from farm buildings. Horses can also be used for plowing.

Manure and composts from the farm feed the land with nutrients, trace elements and minerals which will build long-term fertility. Nitrogen levels can be raised organically through green

manuring using legumes (such as clover) which have a symbiotic relationship with nitrogen fixing bacteria.

Established pastures may be enriched and sustained by the inclusion of deep rooting plants such as docks which help bring up minerals which might otherwise leach away. The herbal ley seed mixtures will produce good grazing turf which is sustainable without the chemical management required for the rye seed monoculture of the chemical farm.

Diversification is a key element for the eco-farm so that if disaster strikes, risks will be spread and some produce or animals should survive. A range of ecosystems will support different species and should include woodland, orchards containing local varieties of fruit trees and grazing, fishponds, water courses, land for a wide range of arable and vegetable crops, and pasture for hardy stock suited to local conditions – like the Sussex beef herd on Tablehurst Farm near East Grinstead, and the South Devon cattle at Little Ash Eco-Farm in Devon – as they will also be less susceptible to disease.

Although labor costs may be higher on the eco-farm (it takes one hour to spray an acre and one day to hand weed an acre) the exorbitant prices of energy, fertilizers, pesticides, and high protein animal foods are avoided and eco-farms are able to provide a livelihood for the farmer and his workers. As Dr. Kiley-Worthington from Little Ash Eco-Farm says, “These farms are not ‘hobby’ farms”.

The lure of the eco-farm is so strong that unpaid labour may appear as neighbours, friends and burnt-out executives often jump at the chance of being involved in the work. During the potato harvest at Tablehurst Farm, the field became full of helpers working together, making new friends and feeling enormous satisfaction with their back breaking work!

The Importance of Trees on the Eco-Farm

As trees and hedges have been uprooted to create bigger fields for ever-larger farm machinery, the levels of carbon dioxide have increased. Trees are essential to reduce pollution, stabilise the ground and cast welcome shade over it. They form the backbone of the eco-farm. Woodland can form a shelter belt for the farm or protect the banks of a stream. It will support a myriad different species of insects, birds and small mammals which form an important part of an ecosystem. Delicious nuts, fruit and edible mushrooms contribute to the abundance of the harvest; and the timber is important for biomass, building and furniture. While the best soil will be earmarked for crops for grazing, woodland may thrive on poorer land and be a wonderful attraction for visitors – children and adults alike can delight in listening to the birdsong, admiring squirrels scurrying along branches, discovering pockets of primroses, or swathes of bluebells in the spring, and in the summer enjoy the cool leafy canopy.

This way forward for farming aims to create and sustain a beautiful landscape and reawaken the symbiotic relationship between man and his environment, conserving the land’s precious resources while respecting the rights of animals. The eco-farm can provide a livelihood for the farmer, and generate other small businesses. It has the potential to sustain a thriving rural community and to give children live education in the wonders of organic food production.

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FROM: <http://www.permaculture.co.uk/mag/Articles/EcoFarming.html>

The Practical Application of Permaculture

Permaculture is not limited to plant and animal agriculture, but also includes community planning and development, use of appropriate technologies (coupled with an adjustment of life-style), and adoption of concepts and philosophies that are both earth-based and people-centered, such as bioregionalism.

Many of the appropriate technologies advocated by permaculturists are well known. Among these are solar and wind power, composting toilets, solar greenhouses, energy efficient housing, and solar food cooking and drying.

Due to the inherent sustainability of perennial cropping systems, permaculture places a heavy emphasis on tree crops. Systems that integrate annual and perennial crops—such as alley cropping and agroforestry—take advantage of "the edge effect," increase biological diversity, and offer other characteristics missing in monoculture systems. Thus, multicropping systems that blend woody perennials and annuals hold promise as viable techniques for large-scale farming. Ecological methods of production for any specific crop or farming system (e.g., soil building practices, biological pest control, composting) are central to permaculture as well as to sustainable agriculture in general.

Since permaculture is not a production system, per se, but rather a land use and community planning philosophy, it is not limited to a specific method of production. Furthermore, as permaculture principles may be adapted to farms or villages worldwide, it is site specific and therefore amenable to locally adapted techniques of production.

As an example, standard organic farming and gardening techniques utilizing cover crops, green manures, crop rotation, and mulches are emphasized in permacultural systems. However, there are many other options and technologies available to sustainable farmers working within a permacultural framework (e.g., chisel plows, no-till implements, spading implements, compost turners, rotational grazing). The decision as to which "system" is employed is site-specific and management dependent.

Farming systems and techniques commonly associated with permaculture include agroforestry, swales, contour plantings, Keyline agriculture (soil and water management), hedgerows and windbreaks, and integrated farming systems such as pond-dike aquaculture, aquaponics, intercropping, and polyculture.

Gardening and recycling methods common to permaculture include edible landscaping, keyhole gardening, companion planting, trellising, sheet mulching, chicken tractors, solar greenhouses, spiral herb gardens, swales, and vermicomposting.

Water collection, management, and re-use systems like Keyline, greywater, rain catchment, constructed wetlands, aquaponics (the integration of hydroponics with recirculating aquaculture), and solar aquatic ponds (also known as Living Machines) play an important role in

permaculture designs.

FROM: <http://www.attra.org/attra-pub/perma.html#characteristics>

SUPPLIES LIST FOR 12 PEOPLE FOR ONE YEAR

FOOD: TOTAL 1,000 QUARTS OF VARIOUS FOODS - (If you have fewer people to feed, you won't need as much: Your choice from the following:

Beef - Cooked and Canned

Pork - in lard - will not spoil even if not refrigerated

Canned chicken.

Note: In winter, you can wrap meat and leave it outside frozen where animals can't get it.

Sardines (optional)

Tuna

Flour - wheat, (300 lbs per person)

whole wheat,

rice, (100 lbs per person)

corn meal

Oatmeal (50 lbs per person)

Alfalfa seeds (10 lbs per person) Seeds can be sprouted and eaten raw.

Alfalfa and wheat seeds are excellent in salads.

Salt (3 lbs per person)

Spices

Sugar (60 lbs per person)

Spices

Coffee

Tea

Rice

Peas (50 lbs per person)

Beans (50 lbs per person)

Lentils (50 lbs per person)

Honey (60 lbs per person)

Cayenne Pepper - 1 large can

Herbal Seasonings

Dried Milk (80 lbs per person)

Powdered Coffee and Tea

Peanut butter (50 lbs per person)

Assorted Cheese

Granola Bars

Kook Aid and Instant Fruit Drinks

Hard Candies

Cookies

Popcorn

Noodles

Bisquick

Mixed Nuts

Instant Puddings

Bottled Water
Corn
Soybeans
Dried Beans
Poppy Seed
Green Beans
Tomatoes
Carrots
Canned Fruits
Canned Vegetables
Canned Seafood
Sunflower Seeds
Almonds
Walnuts
Maple Syrup (You can grow your own trees. Cooking 40 gallons of sap makes 1 gallon of syrup. (See [Survival](#) for instructions)
Canned Pumpkin
Canned Potatoes
Canned Yams
Canned Pineapple
Cake Mixes
Bread Mixes
Canned Berries
Canned Pie Fillings
Dried Cereals
Canned Spam
Salsa
Canned Chili
Canned Soups
Canned Frostings
Dried Potato Mixes
Beer
Soda (not Diet - it doesn't keep in warm weather)
Pasta Sauce
Refried Beans
Pastas
Dried Fruits
Olive Oil
Corn Oil
Cannola Oil
Corned Beef
Gatorade
Sports Ade
Toaster Tarts (you can eat these untoasted too)
Cannas Pastas
Energy Mixes - Dried and Canned
Ramen

Split Peas

Watermelons can be kept in the granary covered with grain. They won't spoil.

OTHER NEEDS

Garbage Bags

Dish Soap

Laundry Soap

Fabric Softener

Toilet Tissue

Paper Towels

Nose Tissues

Stacks of Old Newspaper

Bee Sting Kit

Coffee Grinder

Whole Wheat Grinder (Make sure to keep mice and rats away)

Meat Grinder

Medications

Baby Supplies if you have an infant

Dog Food

Cat Food

Bird Seed

Medications for your pets

Clocks

CLEANING EQUIPMENT

Brooms

Dustpans

Vacuum cleaners

Rags

Soaps of various kinds

Deoderizers

Mops

Cleaning chemicals - various kinds

CAMPING:

Mosquito netting

Punk sticks

Bug spray

Bug repellent

Bee sting kits

Snake bite kits

Sleeping bags

Rain slickers

Hiking boots

Extra dry socks

Rain boots
Gloves
Tents
Tarpaulins
Air mattresses
Puncture kits
Rain repellent coating paint
Ropes
Ridge poles
Stakes
Pins and rings
Repair kits
First aid kits
Mallets
Nets
Straps
Clips and hooks
Hammocks
Bungee stretch cords
"D" rings
Buckles
Silicone water guard
Brass grommet kits
Sewing awl and thread
Stuff bags
Ditty bags
Mesh bags
Air hand or foot pump
Wool blankets
Folding camp stools
Folding tables
Folding pots, pans and utensils
Back packs
Climbing gear
Pick axe
Helmets
Hats

Survival Food Kits

Raisins
Hard sausage
Sticks of beef jerky
Canned and slab bacon
Powdered orange drink
Bagels
Powdered coffee or tea
Assorted cheese

- Pita bread
- Granola bars
- Peanut butter and jelly
- Kool Aid instant fruit drink
- Hard candies
- Instant soups
- Cakes, rolls, cookies
- Popcorn
- Minute rice
- Instant mashed potatoes
- Noodles
- Bisquick
- Mixed nuts
- Dehydrated fruits
- Instant puddings
- Salt
- Pepper
- Honey
- Sugar

Take along 5 days worth of food in case you might get lost

- Propane Stove
- Propane Heater
- Halogen Lamp
- Flashlights
- Batteries
 - (Get the new type you shake with LED bulbs)
- Insulated food and drink containers
- Grill grids
- Canteens
- Waterproof matches
- Foxhole shovels
- Fire sticks
- Magnesium fire starter
- Insect repellent
- Sun screen
- Heavy clothing
- Portable toilet facilities/bags
- Toilet tissue
- Sun glasses
- Binoculars
- Mini tool kit
- Snow Shoes (in winter or in the mountains)
- Skies (in winter or in the mountains)

OTHER EMERGENCY PREPARATION

Have an extra pair of glasses available

Have dental work or surgery done before an emergency happens. Don't put things off.

Keep an extra supply of medications on hand.

Keep extra gasoline and a gallon of water in the car.

Keep a sleeping bag and blankets in the car.

Keep at least 5 gallons of drinking water in the house. One gallon per person per day.

Boil water after an emergency situation. - Don't take chances with bad water.

Keep on hand a supply of dried fruits and nuts at least 5 days worth per person.

Have basins or buckets to catch rain water in.

Have a supply of water purification tablets or bleach - plan to boil water otherwise.

Have a good first aid kit.

Water purification kits

Water

1: go away at least 100 feet from the shoreline to get your water

2: Avoid any water that has a greenish tinge. It contains algae and is loaded with micro-organisms. (It is usually found in shallow water)

3: Don't take water from backwaters or stagnant areas.

4: Don't drink water contaminated by wastes from a paper mill. Secure your water from incoming streams instead.

5: Don't take water near beaver dams or lodges. Diseases from them can make you ill for several weeks.

FIELD TREATMENT OF WATER:

1: Boiling. Most organisms are killed instantly when water reaches a rolling boil. A one minute boil is usually adequate, except in problems areas or high altitudes.

2: Portable filters, the vacuum operated, portable filters sold at camping shops will produce quality water, but they are slow. Not all filters kill all organisms.

3: Chemicals will release iodine or chlorine are available in tablet form from most pharmacies and camping shops, generally iodine is more effective than chlorine. Neither works well in cold or cloudy water.

4: Boiling remains the most reliable method for treating drinking water.

CLOTHING

Underwear - many sizes - for all ages and sexes

Nightwear for colder weather

Blouses

Shirts

Pants - male or female - all ages and sexes

Hats - for protection against too much sun

Caps - same

Handkerchiefs

Scarves

Bandanas

Belts

Coats
Sweaters
Socks - wool for winter and summer socks
Learn to darn socks - don't wear socks with holes
Shoes - no high heels
Boots
Robes
Slippers
Sunglasses
Eye glasses - varied prescriptions as needed
Magnifying glasses
Watches
Aprons
Diapers - cloth only
(Indians used moss or dry grass in a buckskin cover)
Women's cloth pads - no disposable pads

OTHER NEEDS FOR YOUR FARM

This list is in alphabetical Order. You can choose from this list as you desire. Not everyone will need all of this:

ANIMALS

Animals also require their own types of food to plan for

Chickens
Pigs
Cows
Goats
Horses - working type
Beef Cattle
Rabbits

BEES

Bees are kept in boxes stacked in piles

See topic Bees at [Survival](#)

25 boxes should be sufficient

Inside the boxes are frames on which the bees make their honey. Frames are made with a foundation of wax impressed on both sides with a pattern of honeybee cells. Bees use this pattern to build their cells.

The hives are protected with heavy plastic during the winter. Beeing season begins when the trees and flowers start to bloom in spring.

The colony of bees, can be up to 60,000 bees, but there is only one queen bed.

To take care of the bees, a bee suit is required, a coverall which fastens at the wrists and ankles

tightly.

A hat is worn over the head with a heavy veil.

A zipper on the bottom of the veil connects to a zipper at the top of the coverall suit.

Leather gloves are also worn.

A bee sting kit should be handy in case of allergy to bee venom.

When the hive is opened, it is heavily smoked with burning twine which makes a heavy but cool smoke. This makes the bees load up on honey which makes it harder for them to sting.

A hive tool is used to loosen the seal the bees made between the frames and the box.

A healthy hive needs to be fed with syrup dripped down into the hive through small holes.

If the frames are empty, a new queen is needed immediately or there will be no honey during the summer.

Queen bees can be ordered from a supplier of bee equipment.

A record must be kept of each box, detailing what is being done and what is needed.

New queen bees arrive in a small cage with worker bees.

The queen cage is sealed with a piece of candy.

It takes about 3 days for the bees to eat the candy and release the new queen. The bees will be used to her by then and take care of her.

When hives are being combined, a sheet of newspaper is put between the cages. They will eat through the newspaper and by that time, they will know each other well enough not to kill each other.

Bees work only inside the hive during the first 20 days of their life. Then they begin to forage.

They produce only 1/12 of a teaspoon of honey during the 6 weeks they live. Many new bees must be produced during this time to take over his place.

A bees makes about 10 round trips from the hive in one day.

Bees travel no more than about 1/2 mile from the hive.

Dandelions are usually the first flower visited by bees in the spring.

Sweet white clover and alfalfa make excellent honey.

Clover honey and orange blossom honey is light in color and mild flavored.

Honey from things such as buckwheat would be dark and strong tasting.

When a colony swarms, about half of the hive leaves, taking the old queen with them.

The hive will swarm if it is too crowded - in one season with good care - 9 hives can turn into 56 hives.

Queen cells will be made at the bottom of the frames.

A new hive or swarm needs a new queen bee.

Royal jelly produced by the bees are fed to the queen cells which turn a regular bee into a queen.

To prevent swarming, remove the cells with the new queen bees developing, or add an empty hive body with a sheet of newspaper between, or divide the hive into two hives. This is not foolproof but worth trying.

A swarmed hive makes no money that year.

The bees need a place to store their honey, so you put the 'Supers' (Boxes) on top of the original, and keep stacking the Supers on top as long as the bees keep making the honey.

A stack may have as many as 5 Supers on top, but nine Supers is not unusual.

To prevent the queen from entering the Supers, a queen excluder which is a piece of plastic with small holes that only the worker bees fit through. This is placed on top of the hive separating the queen from the Supers with small holes that she won't fit through.

A BEE FRAME: is removed to begin honey processing when the Super is 3/4 full of capped honey cells. When you remove the frames from a hive, you also remove the bees clinging to them. To remove a whole Super, you must use bee repellent. A bad smelling chemical which repels bees - called 'Bee go'. You place the chemical face down on a fume board over the Super which drives the bees down into the next Super down into the hive. The the Super can be removed, just by brushing away the last few remaining bees. You must cover up the honey filled Supers to keep bees from other hives from coming over and stealing the honey. They are attracted by the sweet smell. Once bees become robbers, they will invade other bee hives to take the honey.

THE HONEY HOUSE: The honey house has large glass windows and a concrete floor. Along the walls the Supers are stacked. In the honey house, honey is taken from the frames and put into glass jars.

EXTRACTING: First the caps must be cut off the cells using an electrically charged knife. The frame is propped over a decapping tank. (If there is no electricity, you will have to improvise with a regular knife by hand) The wax caps fall down into the tank along with the honey. Not all of the honey falls out however, which must be put into a machine called a honey extractor. The barrel shaped machine has a rack that holds 12 frames. The machine spins like a washing machine tub. The rapid spinning pulls the honey from the cells and throws it against the walls of the extractor. The honey runs down and collects at the bottom where it is withdrawn out through a spigot into buckets. Filters over the buckets catch bits of wax which is not wanted in the honey jars.

NOTE: The scraping from the edges of the honey frame are used medicinally to prevent colds, flu, etc. It is dark and strong flavored, and can be used in tea and is as good or better than penicillin.

AUTUMN CHORES: Check the coverings on the hives to make sure they are secure. Make new frames for the hives for spring use.

COLD FRAME/HOT BEDS

By means of hot beds, plants of desired flower and vegetable varieties may be started weeks or even months before they can be sown outdoors. One may start their own seedlings rather than relying on other sources for seedlings or potted plants. Thus, one can start one's own seed in the hotbed, pricked-out in coldframes, inured to the weather 'hardened off' and when outdoor conditions are favorable, transplanted to the garden.

By starting hardy perennials and biennials several weeks before outdoor sowing would be safe the plants may be often be made to bloom during the first season instead of having to wait until the second year. Similarly, cuttings of many perennials, roses, and other flowering subjects may be started in a hotbed and advanced by the same stages to the open ground.

The coldframe alone may likewise be used for slower rooting varieties. Risks of starting tender subjects too early or too late outdoors may be avoided. When seed of such varieties is sown too

early in the open weather may be so cold and wet, it may decay or the seedlings may be nipped by a tardy spring frost, when too late, the plants may meet unfavorable summer conditions develop poorly and perhaps be destroyed by an autumn frost before they have reached their desired development. This is of special application to growing cantaloupes, cucumbers, watermelons, tomato, eggplant, pepper, dahlia, canna, and geranium.

In localities where blight destroys watermelons, cantaloupes and cucumbers, hotbeds and coldframes also enable the gardener to avoid this disease or to ward off its effects until after the fruits have ripened, for by starting the plants on inverted sods, in flower pots, or other convenient receptacles to favor transplanting, they may be kept in the frames and readily sprayed, dusted, or fumigated to kill cucumber beetles and squash bugs which not only feed on them but spread blight infection from plant to plant.

Even when not growing plants, coldframes are used for extending the ripening season of tomatoes that would otherwise be spoiled by an early fall frost. The fruits that show pink may be gathered when falling temperatures threatens damage, placed on deep layers of straw in the frames and covered with sash whenever the weather is wet or cold. The rate of ripening may be accelerated to a week or so by keeping the sash on the frames during the day, thus raising the temperature, or it may be delayed by leaving them off whenever the weather will permit without risk or frost-bite. Thus the tomato season may be extended to Thanksgiving day or even later. The frames may be used to store such late vegetables as celery, endive, cauliflower, brussel sprouts and chicory, and for carrying semi-hardy plants such as chrysanthemums over winter.

Standard hotbed frames are made in 3' x 6' and 6' x 12' foot sections.

For a coldframe, no excavation is usually made, for a hotbed, the area to be excavated should be at least 6' wider and longer than the frame so there may be plenty of space for the foundation. This may be made of stone, brick, concrete or 2' planks, preferably 'pecky' cypress, otherwise clear cypress or some other wood that resists decay - locust, chestnut. The foundation should extend a few inches above the surface to increase the longevity of the frame itself. A post is at each corner and at 4' intervals on the sides of all wooden foundation frames.

The depth of excavation will depend upon the climate, it varies with the local frost line. From Maine to Minnesota and northward, 24" to 30" is favored, in south-eastern New York, 18" to 24", near Washington DC, 12". In the south the frame usually rests directly on the ground without excavations or foundation frame.

Though all commercial sash are 3' x 6', users have preferences and objections to various types. Some prefer lightweight styles because they are easier to handle than heavy ones; others prefer heavier ones because glass breakage is less. For this same reason, many growers prefer sash with four rows of panes rather than three, but three row style casts less shadow.

Double glass sash have both proponents and opponents, the former claiming protection equivalent to straw mats placed upon single glass sash, thus avoiding the work of laying and removing the mats (real work when wet or icy) giving the plants full sunlight, and therefore better growing conditions than under single glass sash.

Opponents object to the greater weight of the double glass sash. They also say that more

moisture is retained, therefore adding to the risk of decay.

The only difference between a coldframe and a hotbed is that heat in the former all comes from the sun. Hotbeds may be heated in several different ways. Fermenting material especially fresh horse manure, is objectionable because of its scarcity, high cost, labor to prepare, short period of usefulness, fumes of fermentation, and the excess of attention to ventilation that beds so heated require. It is inferior to all other means of heating hotbeds.

Electricity has become the most popular source of heat because of its advantages over all other methods, but in the time and period where there may be no electricity available, the coldframe method will have to be used and heated by the sun.

A coldframe may be converted to a hotbed and vice versa by merely turning a switch off or on.

Coldframes can be kept from freezing by hanging electric cables around the inside walls and turning on the current if electricity is available. Regulation is done by the thermostat which may be set to operate the current at any desired temperature.

Bottom heat should be least costly for seed germination, lights most desirable for rapid growth, especially in cloudy weather. A combination of the two would supply the widest range of adaptability. Lights would be desirable for beds smaller than 6' x 6'.

Heating capacity of 200 watts would require 120 feet of cable, a length cumbersome to install in small areas.

COMPOSTING

Compost all kitchen food scraps

Compost all cut grass and leaves and garden waste.

COVER CROPS: See green manure

CROPS: HOW TO CHOOSE

Crops to grow, area to plant, livestock and how much to keep are problems which demand knowledge of market requirements, conditions and personal usage. When the produce is to be sold, the advantages and disadvantages of various competing regions, knowledge of price trends and the potential production of the individual farm.

Most farm products are supplied by many farmers working independently and competing with one another in the marketplace. Usually the keenest competition does not come from producers, in other districts, but from the neighbors. Each farmer, therefore, should know what these competitors are planning to do. He should use the knowledge supplied by the department of agriculture as to the combination of the various crop and livestock enterprises and economic conditions.

SHORT SEASON CROPS ONLY

1. CORN

A cover crop of hairy vetch will yield 40 bushels of corn per acre, whereas 200 pounds of phosphate fertilizer would only produce a crop of 13.5 bushels per acre. Adding 85 pounds of nitrate soda to the 200 pounds of phosphate would produce only 24 bushels per acre.

Start your own corn breeding by choosing the best 50 or 100 ears of corn you can find in the crib. Be sure they are properly cured specimens of good form and size, well filled out and well rounded on both ends, each one pleasing to the eye. Lay them side by side on a table, critically examine each under a good light in comparison with the others and ruthlessly discard the poorest, the next poorest and so on until only 10 are left. These are to be your nucleus for breeding. Before shelling the grain from the cobs, pick out 10 or 20 individual kernels from the center of each cob. Discard the butts and tips of each cob. Do a germination test of these kernels, keeping each cob kernels separated so you know which ones sprouted quickest and sturdiest. The best cob should be used to grow a 'test plot' in a row by itself. During the summer, examine the plants to make sure which row or rows produce the sturdiest plants. Especially determine which plants produce two ears per plant. The ones that produce only leaves or poor cobs, cull out and feed to the cows or make into compost.

At harvest time, cut and cure these test rows by themselves and for the following year, repeat the selection process already described. Use the two ear stalks from the other rows to sow the general field for seed corn. Each year your crop will be more valuable than the year before.

2. HAY /WITH OATS: in grain, hay and other field crop farming, the rent or interest on the land cost may be 50% of the total expense of growing and harvesting.

Sweet clover is hay
Alfalfa is hay

3. WHEAT

Winter wheat is planted in fall

4. RYE

If no cattle - corn or oats

SOYBEANS

OTHER DRY BEANS

POPPY SEED: 50 TO 70 POUNDS

After seed head forms - pull the leaves off so head dries faster

POP CORN - 1,000 pounds a year. Baby rice - white is best. Keep biggest ears for seed for following year.

RADISH, LETTUCE, CARROTS, KOHLRABI, PEPPERS, CAULIFLOWER, BRUSSEL SPROUTS, PEAS, ONIONS, (Several kinds)

MELONS

GREEN BEANS

POLE BEANS

TOMATOES

POTATOES: Plant various kinds - Not all one kind. Red potatoes are not keepers. Eat them first. For breeding, pick out the best shaped, good sized, shallowest eyed tubers. Cut each tuber in quarters from end to end, but keep each four pieces separate from the others. Plant each piece in a hill by itself. Then kip each fifth hill so as to keep the four pieces of each tuber in consecutive hills. During the summer, treat them all alike, watch for differences of foliage, resistance to disease and other point good and bad, and dig the weaklings for 'new potatoes'. At harvest time, dig each hill carefully by hand and place the tubers from each four hills together for judgment. discard the groups of four that produce unsatisfactorily either as to size, number, irregularity, or other defect. Keep only the best for seed for the following year.

Put a fresh coat of cow manure on the garden every year. If chicken manure, use very lightly. Horse manure is okay. Sheep manure stinks really bad. Farm land should have 25 tons of manure per acre per year. If commercial fertilizers and frequent green manure or cover crops have been the regular practice, the land should be in good condition.

CULTIVATION

In cases where cultivation must be done by horse or tractor and the rows must, therefore be spaced farther apart than when the wheelhoe is used, it is essential as a time saving factor to make the rows long and few rather than short and man, so as to reduce the amount of time turning at the ends. Even so, time may be saved by skipping several rows when making each turning because less time is needed to make a long turn than a short one, especially with a horse or a fast moving, heavy, or long radius tractor.

Should a complete row be likely to produce more of any one vegetable than would be needed, it should be filled with two or more kinds that require the same general cultural treatment. A well balanced farm garden may be arranged to provide a large assortment and continuous supply of vegetables throughout the growing season for use fresh, canned and for winter storage.

Sowings should be made at four different times. This is because of the effects of frost and because seasons vary, some being early, others late in opening. For the latter season, the time between the early sowings should be increased in an early spring and made about the time that the earliest trees, such as silver maple open their buds.

To take advantage of the cool fall weather, a second crop of cool-season vegetables may be grown.

Fall garden vegetables do not thrive in warm weather and too early planting will stunt some kinds and cause others to become coarse, woody, or pithy and unfit for use.

Crops should be rotated from year to year

The soil may be fall plowed and left rough over winter to catch snow and avoid runoff. Snow

fences may be set up to catch snow. Effective snow barriers may be made with a row of corn shocks or even by several rows of standing corn plants.

The function of cultivation with vegetables is to conserve moisture by eliminating weeds, to close up cracks and provide a loose, rough surface which will absorb rainfall and prevent runoff. Deep cultivation destroys many roots, reduces the yield of most vegetables and is unnecessary. Shallow surface cultivation is recommended for all vegetables, especially in un-irrigated soils and in dry seasons.

Snow and avoid runoff

Mulching gardens with straw or other litter such as hay or manure is a practical way to increase yields and produce vegetables of the best quality. The benefits are greatest with long-season crops and in dry years. Though straw mulches have increased the yields of nearly all vegetables, their use is not recommended with early short-season crops such as leaf lettuce, peas, spinach, seeded onions, cauliflower, and early cabbage. With root crops such as carrots, beets, and parsnips their use does not appear advantageous and with transplanted onions is of doubtful value. The difficulties of applying straw more than offset the advantage which most of these crops might gain. Straw mulching has been found desirable with all long season crops except sweet corn. Straw should not be applied until the plants are well established. A mulch of 2" to 4" is adequate. Deeper is unnecessary and undesirable.

Between 10 and 15 tons of straw are needed for mulching an acre, or about 500 pounds for 2,000 square feet.

At the end of the season, straw mulches should be removed and burned because of the unfavorable effect upon the soil when such a large amount of dry organic matter is plowed under. This is most serious with un-irrigated or sandy soils.

With potatoes, the straw mulch should be applied before the plants come through the soil. With other crops, such as tomatoes, eggplants, and other transplanted vegetables, before transplanting or after the plants are established, preferable at the latter time.

Irrigation

Most vegetable crops can be increased and improved by irrigation. Straw or paper mulches are also useful. Irrigation will be found desirable at some time in practically every season and often in many seasons. Except for hastening seed germination in a dry spring, irrigation is seldom needed before July and not after August. [In dry climates where there is no rain at all after May, use your best judgment as to when to begin and end irrigation]

Needless or excessive irrigation early in the life of the plants might cause the development of shallow root systems. However, vegetables should be kept growing steadily. Knobby, growth-cracked, hollow, rough-shaped, double and otherwise undesirable vegetables are produced when growth is uneven, especially when a period of abundant moisture follows one of prolonged drouth.

One inch of water, in one rain, or from irrigation should maintain vigorous growth of most

vegetables for five to seven days during hot weather, and 10 to 15 days in cooler weather.

Smaller amounts or larger amounts of water at one time are less desirable, because the soil will be poorly aerated for a time and the loss from rotting, blight, etc. will be increased.

DRAINAGE:

Undrained lands are not merely wet but cold and often acid. Because of wetness, they cannot be worked nearly as early in spring as well drained lands, when seed is sown it germinates poorly, unevenly, or not at all; such plants develop roots near the surface and when summer comes they suffer because they cannot then reach water which by that time is at much lower levels. Crops are therefore late, poor and unprofitable.

When land is not naturally well-drained, artificial drainage is a necessity, tile drainage of agricultural lands is a comparatively expensive improvement and the capital expended in drainage work cannot be recalled or transferred, but owing to its permanent nature a properly installed drainage system should continue to return dividends for many years.

All soils not naturally drained require drainage. These are usually cultivated areas with fair surface drainage but with heavy subsoil; heavy clay soils with little or no surface drainage; rolling areas with impervious subsoil areas, large and small, saturated long enough each year to destroy the physical condition of the soil and to interfere with spring seeding and harvesting operations; pot-holes and swamp areas.

Tile may be installed either by hand or by a ditching machine. The latter, when properly operated is quicker, more efficient, and usually more economical.

The grade must be uniform so there will be no depression to collect sediment; a solid bottom is essential - tile laid on muck or other soft material are likely to shift out of alignment and to obstruct the flow of water; stones and other obstructions encountered in the trench must be removed, the holes carefully filled and tamped to give a solid bottom; only the best tile should be used; blinding and backfilling must be carefully done to prevent the breakage of tile by rolling in stones or by horses stepping in the trench; junctions and outlets must be carefully laid and trees likely to block the tile with their roots must be removed.

Tile should be laid as closely together as the cut ends will permit. In heavy clay soils, a little opening is not objectionable, but in sands or sandy loams, it is necessary to fit them closely together. In the latter, it is often desirable to cover the upper half of the tile with tar paper to prevent the sand from entering. Junctions should be carefully constructed in order that no obstruction may offer resistance to the flow of water. A few inches of soil, preferably the surface soil, should be placed over the tile as soon as they are laid to make sure they will not shift by accident. Backfilling should be done as early as possible because soil often becomes baked after a rain or in other ways is hard to move.

Depths and distances apart of drains depend almost entirely upon the nature of the soil. The lighter the soil, the deeper and farther apart; in heavy soil, they must be placed closer together and somewhat shallower.

Quicksand is the worst of problems. Undertake quicksand drainage during the driest part of the season; if possible, after opening the drain into quicksand, leave it until the water drains out of the sand and solidifies and the drain can be more easily completed. In some cases, it is better to remove the last foot or so by hand, as action of the digging wheel seems to provoke the trouble; sod thrown in the trench and around the joints is practical for short distances; straw, sawdust, shavings, gravel and cinders are often used to good advantage, cemented sewer pipe may be found practical in some cases; a silt basin should be constructed on the line of tile as soon as possible after passing through the quicksand area and the deposits of silt removed when necessary.

Tree roots seldom interfere with a drain unless it carries seepage or spring water during the dry season. All trees such as willow, poplar, soft maple, elm, and elder bushes should be removed from the location of the drain. They are likely to clog the tile with roots. Where it is desirable to leave a shade tree, cemented sewer-pipe should be used for at least 50' on each side of the tree position. In orchards and permanent crops, cut-off drains should be installed to remove all seepage water as this has a tendency to feed the tile drain during the summer and thus give trouble by root development in the tile.

The outlet of a drain should be well-protected. The last 8' or 10' should consist of a piece of iron pipe or sewer pipe. A retaining wall may be a necessity, so may be a concrete or stone block to spread the water and prevent it from eroding the earth at the exit. Protection of the mouth to prevent the trampling of cattle and horses is also essential, and so is a grating, preferable hinged or hung from above, to prevent the entrance of small animals.

Tile may be made of clay or concrete. They should have the following characteristics; smoothness inside to reduce friction and promote rapid flow; hardness inside to reduce friction and promote rapid flow; hardness to assure drainability; good shipping and handling qualities; good shape-cylindrical - not warped; clean cut ends to assure good fitting; freedom from burnt limestone to prevent breakage due to slaking of the lime.

EARTHQUAKES

Be prepared for possible earthquakes, especially if you are in an area that gets big ones.

Discuss preparations and various courses of action and have earthquake drills. Learn to listen to the earth so you will have advance notice if something is going to happen. Animals are perfect warning systems. They sense earthquakes long before humans do.

Know how to shut off the gas, water, and electricity. Keep the gas tanks full at all times for emergencies. If you are religious, make prayers, offerings or ceremonies for the keepers of the fault line or volcano close to you.

ELECTRIC POWER

Electric power may not always be available. Have a supply of candles always available. Have flashlights with good batteries available. Use solar or wind power if possible.

FAILURE: WAYS TO:

Unfavorable soil
Undrained land
Rocks and stones everywhere
Wrong crops for your area
Improperly prepared and tilled land
Too large area devoted to lawns and ornamental planting
Excessive time devoted to pets
Pets occupy areas that should pay profits
Inadequate manuring or fertilizing
Failure to fight insects and plants diseases

FARM CHORES

ALARM: 5 A.M. Milk cows, goats
Heat up water for animals in winter
Get kids up for school - make breakfast
Kids eat cereal or eggs and bacon
Meat and potatoes for farm workers
Children as young as 5 years old can help do chores
 They can feed chickens, geese
 They can help in the house
 hey can be water boys for the workers

CHORES: Winter - clean barns
 Spread manure on fields
 Feed cows, pigs, coats, chickens
 Grind feed for several days use
 Summer -

Let cows out for pasture

Horses: feed horses - takes 8 or 9 horses for 160 acres if there are no tractors

Do field work - plow - seed - cultivation

Run rows north and south wherever possible for more favorable distribution of sunlight.

MAY: First crop of hay - stack outside for outside feeding

JULY: Second crop of hay

 Cut grain - no shocking - 6 weeks drying

AUGUST: Do threshing

 Neighbors get together for crews

 Go from farm to farm until all are finished

SEPTEMBER: Third crop of hay

FENCING:

If there are many fences made out of split rails or zig zag fencing, or fences made out of stones and rocks 10 to 15 feet wide, you are wasting many feet and acres of usable soil better used for production. You can use the rail fences for fire wood. Get rid of the rock fences, since they harbor weeds, insects, and animals that attack crops and annually require labor, time, and expense to cut the gangly growing bushes and trees that start in the. You can make one large field out of an area that is now two small fields. One large field is easier to farm than two small fields.

FERTILIZER: Commercial - use only when fresh manure is not available

Commercial fertilizers are of two classes.

Organic (of vegetable and animal origin)

Inorganic (of mineral origin)

Dried blood, dried fish, and cottonseed meal are all rich in nitrogen, but contain less potash and phosphoric acid. Ground bone is noted for phosphorus, but has less nitrogen and potash. Tankage has good phosphorus, but less varying nitrogen depending on what it consists of. Nitrogen is the growth maker.

In the presence of sunlight, when supplied with water, plants are able to get all their necessary plant food except nitrogen from the air and soil. Growth, repair, and reproduction are all directly or indirectly dependent on nitrogen. Nitrogen washes out of the soil easily. Therefore it should be applied in frequent doses by small amounts during the first half of the growing season, never late in the growing season because it causes fast sappy growth which freezes when cold weather arrives.

Nitrogen can be supplied from nitrate of soda, and sulfate of ammonia. The former contains 15% nitrogen, and should be applied in small doses every 2 to 4 weeks. The latter contains 20% nitrogen and is less quickly dissolved and less likely to be lost by leaching. It should be used in light soils like sand.

Nitrate of soda tends to make and maintain soils in neutral or alkaline condition - favorable to vegetables and ornamental plants. sulfate of ammonia tends to make soils acid and unfavorable to vegetables, but favorable to blueberries, rhododendrons, and other acid-tolerant plants. The acid condition of this fertilizer may be neutralized by application of wood ashes or lime.

Potash is the fiber maker, often lacking in sandy soils which have grown root crops (turnips, carrots, beets, parsnips, etc.) When deficient, the stems and branches of plants are weak and spindling and easily broken by wind.

Potash is available from wood ashes (4%), muriate of potash (50%) sulfate of potash (45%) and Kainit (12% to 16%) Ashes contain all the mineral elements of the plants burned to make them. In order to be most useful, they must be stored and applied dry. It will not usually be worthwhile to buy them, but use homemade when available.

Muriate of potash is the preferred type because it is not washed out of the soil and applied in very small amounts. It can be applied any time of the year when the ground is not frozen.

Phosphorus is the ripener, causes fruit and seed to ripen well. When lacking in the soil, crops

may be slow to mature or may fail altogether. It is usually applied as superphosphate. Basic (or Thomas) slag or pulverized phosphate rock (floats)

Superphosphate (acid phosphate) is the leading seller. The objections to it is that it's analysis is only 17% to 20% which is low, and humid weather tends to cake because of its absorption of moisture from the air.

It is soluble in water and the advantage is that it is less likely to burn the crops to which it is applied.

Before applying any fertilizer, it is advisable to know which one is needed and which not; to avoid wasting materials and money.

The simplest way to do this is to divide the garden into strips of at least 10 feet width at right angles to its width and sow only one unmixed fertilizer on each alternate strip, leaving the others unfertilized, then sow crops lengthwise of the garden so as to cross the strips. The development of the plants will suggest what plant foods are lacking in the soil and therefore which ones to apply.

Yellow foliage will indicate shortage of nitrogen. Weak stems (lack of potash), poor ripening fruits and seeds, (lack of phosphorus)

The best time to apply potash and phosphorus acid is shortly before seed is sown or plants transplanted.

Leafy vegetable are generally stimulated by top dressings during chilly, wet spells when the rate of growth is slow. Cucumbers, eggplants, and tomatoes are often helped by an application of nitrate of soda just as the first flower buds develop. Root crops do not respond so strikingly to surface applications, because they forage more deeply in the soil.

Top dressings usually range from 150 to 300 pounds to the acre. the lower amount being applied, generally all at one time, the larger amount in two dressings. Make fractional dressings at 2 week intervals.

A good mix of fertilizer is:

Nitrate of soda - 5%

Sulfate of ammonia - 10%

Dried blood - 15%

Muriate of potash (or sulfate) - 15%

Superphosphate or ground bone - 55%

The analysis should be published on the package.

It's application should be followed in the vegetable garden by one to three surface dressings of nitrate of soda at intervals of three to four weeks.

Fertilizer must be distributed evenly throughout the garden to avoid burning or killing the plants.

Fertilizer gives best results when placed more or less locally to the seeds or plants rather than scattered promiscuously over the surface.

FINANCES

The net worth or total value of all property above liabilities tell whether or not the enterprise is being run at a profit or loss, and how much. It shows how the total investment is apportioned among the diverse branches of the business.

Cash on hand, is not a safe guide as to earnings, an inventory prevents drawing false conclusions as to prosperity at the close of the year. Often a comparatively small amount of cash discourages a farmer who has done well, but whose earnings are tied up in some kind of property. Conversely, a large amount of cash on hand may have come from a decrease in inventory of other property. an inventory kept up to date, enhances credit relations with banks and other loaning concerns when adjustment is necessary after a fire, it is highly valuable. It is fundamental to the keeping of any accounting system.

Farm accounts reveal the less productive, less economical methods and practices and where income may be augmented; but they are of little or no value unless analyzed and the results studied.

Among important items, they should show the following facts:

- 1 - net earnings the farmer pays himself for his labor and management.
- 2 - gross income or total amount received on sales of crops, live stock and live stock products and increases in inventories each year.
- 3 - volume and increase in business as a whole and from each department - live stock and individual crops.
- 4 - total operating expenses.
- 5 - cost per \$100 of income from each department as a check upon expense control.
- 6 - total live stock.
- 7 - productive animal units per area or the proportion of stocking to the land stocked.
- 8 - acres pastured per animal unit or the economy of pasturage.
- 9 - receipts from stock departments.
- 10 - receipts per unit whether animal or crop, as a check upon the quality of product. Low returns per unit indicate that quality is below par.
- 11 - records of how well horse, tractor, and man labor are being used.
- 12 - productive labor or the average number of hours - horse, tractor, and man - necessary to manage each crop and class of live stock annually.
- 13 - total number of available days' labor annually.

14 - use of man labor compared with available days labor to care for each crop and class of live stock.

15 - number of men needed annually to run the farm.

16 - crop-acres per man or number of acres grown per man.

17 - productive animal units per man, or number of head per man.

18 - crop acres per horse.

19 - days of productive horse - labor to care for each crop and department of lives stock.

20 - days of work, per horse or tractor per year.

21 - after the record has been analyzed the less economical and less productive methods and practices may be studied, amended, or replaced by better ones, and what can and cannot be done to improve conditions may then be considered.

Every farmer should have his account book, take inventories, keep records of receipts and expenses as suggested and thus increase his income.

FIRE: TO BUILD

See: <http://www.greatdreams.com/fire.htm>

FIREPLACES:

See: <http://www.greatdreams.com/fire.htm>

FIRST AID

bandages

mecurichrome

aspirin

tweezers

needles

thread

splints

alcohol

snakebite kit

skin lotion

scissors

nail file

toe nail cutters

boric acid powder

healing herbs (See HERBS)

Have several people trained in first aid care. Keep a kit only in the house, but in the car and in

the barn, with you when you camp or picnic, or hunt, or fish. Always take it when traveling.

vitamins and minerals

apple cider vinegar

honey, garlic, sage tea for colds

mint tea, golden seal, brandy

herbal tinctures

catnip (to help you sleep)

herbs for cooking, including onions and garlic

cayenne pepper, cumin, basil, coriander, salt

FROST DAMAGE PREVENTION

The killing of plants and plant parts by frost may often be prevented by simple, inexpensive, easily applied, means as air cools, its power to hold water in vapor form decreased until it deposits more or less in tiny drops (dew) on objects cooler than itself such as foliage. The temperatures at which this frost occurs depend on the proportion of water vapor in the air at the time. This varies as cooling proceeds, during summer the dew point, as the deposition or saturation temperature is called, is often above 60 degrees; in winter often is below zero.

When the dew point is below the freezing point, the water vapor condenses on still cooler surfaces in the form of fine particles of ice, which because they reflect the sunlight and appear white, we call hoar or white frost. Often this can occur when the temperature is several degrees above the freezing point.

The condensation of water vapor tends to check the fall of temperature because of what is called, "latent heat" in this vapor is returned to the air which, scientific instruments prove, become measurable warmer. Thus, within variable limits the deposition of dew protects plants from frost damage as the temperature approaches or in some cases even goes below instead of above the freezing point. We can often take advantage of this phenomenon and save our plants.

Plants vary in their resistance to frost damage according to their origin and condition. Those which originate in a cold climate (apple, cabbage) naturally are strongly resistant; those from a warm climate (orange, tomato) are weak and easily destroyed. Between these extremes are many intermediate grades. Those plants that, in a given locality, live through the northern alpine winter in spite of deep freezing of the soil are called 'hardy' in that locality; those that succumb to the slightest frost are 'tender' and those half-tender, and semi-tender, (french artichokes).

Tender plants are usually injured more or less when the temperature continues at 32 degrees, 31, or 30 for several hours especially when bright sunshine or quickly warming air strikes them in early morning. Few, if any of them can stand lower degrees than these for even a short time, half-hardy plants often survive temperatures of 20 degrees, but seldom lower degrees.

In all these cases plant condition plays an important part; for plants that have made rapid growth, have soft, immature tissues and are full of water, are far less resistant than those which have developed slowly, have denser stockier growth and are less full (perhaps even in need of) water. This statement applies to hardy as well as tender plants; for even trees normally hardy in

a given locality may be winter-killed because they made a later, sappy growth which did not ripen or which was full of water when cold weather arrived.

The mere deposition of frost on the surface of foliage does not necessarily indicate that the plants have been killed or even damaged. But when the air is too dry for dew to be deposited they may be frozen by a dry wind, or on a clear night without the deposition of either dew or hoar frost. In such cases, damage is too to freezing of the water inside the plant and the consequent rupture of the tissues. When the sun shines on tissues thus injured, the internal ice melts, the leaves have no chance to mend th broken cells so the leaves droop wilt, and turn black; hence the term 'black frost'.

Anything that will prevent the fall of temperature to or below the freezing point and anything that will shield the plants from direct sunshine while they are still frozen, covered with hoar frost or severely chilled will help ward off damage or even save plants that would die or be seriously checked in their development.

A wind that springs up in the evening, clouds that appear during the night or early morning, or a rain that follows a frost will often either prevent the freezing or check the thawing process and thus save the plants. All these phenomena of nature are beyond our control, but we may imitate them.

During the spring, we can avoid over-feeding our young plants with stimulant fertilizers such as manure and nitrate or soda and also avoid giving them excess of water. both these tend to make sappy growth easily killed by frost. On the other hand, by keeping plants cool, almost cold ('hardening' them off) as they approach the time for transplanting to the open ground we can increase the hardiness of hardy, semi-hardy, and even tender plants. Plants so prepared will stand cold snaps whereas those of the same species not so inured would probably be killed or so chilled that they would 'sulk' for several weeks before recovering or renewing a normal rate of growth.

Similarly, we may prevent winter injury of hardy trees, shrubs, and vines by supplying ample water during summer and early autumn, withholding it later, avoiding applications of fertilizer and manures from midsummer forward, counteracting any excess of these by liberal dressings of potash and phosphoric acid during early fall, or by sowing buckwheat in July or rye in September or both these together in July as these crops grow they remove excess water and nitrogenous plant food from the soil and develop plants which when plowed or dug into the ground in spring return the plant food and their own bodies to form humus.

Fortunately, we can predict accurately enough for practical purposes when to expect frost. The daily forecasts by the U.S. Weather Bureau give suggestions as to the general weather to expect; but we can make our own temperature observations and predictions. Local conditions influence temperature. For instance, a nearby body of water such as a lake, the sea, a wide or deep river, or even a large pond affects the rate at which air temperature changes. In spring, more or less retards plant development. In autumn, the reverse effect occurs. The water being warm not only warms the air but fills it with water vapor thus warding off frost.

Open and flat country and small villages are more likely to suffer from late spring and early autumn frosts than the large cities and their nearby suburbs because, in the former, heat loss by

radiation into space is more rapid in clear, clean air and under cloudless skies the latter where the air is filled with smoke and dust and where the fires in countless houses, factories, and other buildings directly raise the temperatures.

Dark colored, sandy and well drained soils absorb and hold more sun heat than do light colored, clayey and poorly drained ones so are less likely to be frosty. Other conditions are also warmer than western and northern ones because they more quickly absorb the sun's rays. Though this favors earliness of plant development it often makes the growing of certain fruits (apricot, peach, Japanese plum,) Precarious or impossible because the flowers are encouraged to open so early that spring frost kills them and thus prevents the fruit production, though not usually killing the trees.

Frosts are morly likely to occur when the air is still, the sky is clear and the stars are brilliant, than when there is wind or clouds, especially overcast. The direction of the wind also help to make a local forecast. One that blows strongly from the north is far more likely to bring a cool or cold weather than one from the south, just as one from the east is likely to bring clouds and rain and one from the west clear skies and colder weather. The rate at which the barometer rises also helps because it indicates the approach of clear weather and, in rapid, also of cold weather.

An usually warm spell is almost sure to be followed by a cooler or cold one because our general weather moves in prodigious waves from southwest to northeast across the country, hence a light frost following a warm spell is likely to do more damage than an even more severe one following cool weather. For this reason, we should be on guard when on of these warm spells occurs in spring. Be ready to protect your seedlings, newly transplanted plants and the flowers on your fruit trees and bushes.

When the sky is cloudy, when there is fog, or even when a haze occurs during or toward evening, frost is less likely to occur, than when the night is clear because these condtions of moisture in the air prevent loss of heat from the earth.

A reliable sign of approaching frost is the rate at which the temperature falls during the late afternoon and early evening, starting with 50 degrees or less, clear skies and no wind. a fall of 2 degrees or more an hour between four and either o'clock, usually indicates that freezing temperatures will be reached before morning unless clouds or winds develop or unless we do something to prevent frost.

FROST PREVENTION

In a small way, individual plants may be protected by inverted flower pots, peach baskets, and other receptacles placed over them, by newspapers spread and held in place by stones or clods of earth. A more convenient adaptation of this way is to use a light screen or burlap mounted on a frame placed over the plants or beds. These all tend to hold the heat around the plants.

Smouldering fires which produce abundant smoke and steam form artificial clouds which check radiation in the same way as do true clouds. When the air is still the smoke spreads out evenly and proves effective as a protection nearly as far as the clouds extend. This method is infeasible where the smoke would prove objectionable to neighbors. Numerous small, bright

fires of wood, coal, or oil are used extensively by commercial growers of fruit and vegetables to heat the air. they are less useful in small areas than the methods already presented.

The most generally feasible method is to fill the air with water vapor in one of the following ways;

Stirring the soil with the wheelhoe or the cultivator towards evening to expose an increased surface of damp earth; sprinkling the plants, the ground and the adjacent area with a hose nozzle that breaks up the water into small drops, or using an overhead irrigation system for this purpose. The water evaporates and as the vapor condenses it liberates heat and thus checks the cooling process.

Freezing of the ground may injure even established trees, shrubs, and vines of some kinds, so anything that will reduce the depth of frost penetration or prevent alternate freezing and thawing will tend to prevent such injury.

Just before winter, a few forkfuls of manure or shovelfulls of soil or peat banked around the trunks of exceptionally vigorous peach trees may survive the winter whereas untreated trees may not.

In order to have extra early beans, corn, melons, and cucumbers, you can sow seed much earlier than locally popular, thus risking frost damage, when no frost occurs you are ahead of competitors, and if frost comes, you can protect the plants as mentioned.

If a frost occurs and you were unprepared, you may possibly have the plants anyway if you spray them with cold water as soon as possible after dawn or before sunrise and also shield them for direct sunlight after the sun appears until they have thawed out and returned to normal activity. Better to keep them shielded until 10 a.m. to noon.

When water freezes, it swells and lifts the crust of frozen earth above the unfrozen ground below. As it does so, it also lifts shallow rooted plants, roots, and all. when it thaws, the soil settles back, but the plants do not. They are left with more or less root exposed. Each succeeding freeze lifts them some more and each thaw leaves them farther out of the ground with the result that they dry and die. Hence the importance of applying a mulch in the fall.

In the spring, equally fatal results may follow unmulched plants because when the surface thaws above a lower layer of still frozen earth the thawed layer settles and when it later freezes and lifts it breaks the roots of small plants by pulling them. Hence, again, the importance of mulch.

GARDENING

Learn how to garden indoors if necessary.

Learn how to sprout seeds for food.

Have a small truck garden near the house as well as large fields.

Flower pots

Sterilized soil

Hoes

Shovels
Watering cans
Watering hoses
Boric acid powder

Learn how to forage for food in your area, such as fruit abandoned in orchards or other abandoned gardens

Learn how to find wild edibles, nuts, berries, herbs, etc.

GREENHOUSE

One of the most important advantages of buying certain standard styles and widths is that these are made in sections. Thus a beginner or a person short of money may start with two, or preferably three sections and add others as he gains confidence through experience or as his finances improve.

By using bench and walk widths as a basis of measurement, the greenhouse companies have decided upon standard widths. Among the favorites are 15', 18' and 25'. A standard house 25' long would consist of two sections, each 12 1/2' long. A 50' one of four such sections or two sections of 25' each.

Such being the case, the beginner may not only avoid making countless mistakes in construction. But knowing that he may make harmonious additions to his first small greenhouse. Whenever possible, the house should face south. A house 15' or 18' wide will prove a better investment than any narrower size. Narrower sizes are harder to operate during changeable weather because of the relatively small volume of air they contain. The air is affected by outdoor temperature and the fluctuations of intermittent sunshine and clouds, to say nothing of wind.

Another advantage of a standard greenhouse is that guesswork is eliminated, especially with heating. The heating requirements of each plant species to be grown is different. The standard green house will keep plants healthy even in blizzards or zero weather.

Adequate ventilation is no less important than heating, for without it, the plants may be 'cooked' even when the weather outside is below freezing. Unless the ventilating system is properly proportioned to the area of roof and the volume of the house it may be inadequate to keep the temperature and the humidity favorable to plant development. Moreover the ventilating apparatus must be constructed so as to be easily operated regardless of outdoor conditions.

GREEN MANURES AND COVER CROPS

Green manures are crops grown solely for the improvement of the soil. When sown toward the close of the season, either alone or among other crops as these are approaching maturity they are often called cover crops because they are intended to cover the ground during winter and thus prevent loss of plant food through washing over the surface ('sheet erosion') or by seepage to lower levels and drainage. In the latter case they are always plowed under in early spring before they have made much growth. Otherwise they might become woody they might decay slowly and thus, for a time be a detriment to the soil.

Plants used for green manures are of two classes; nitrogen gatherers, those that work over

atmospheric nitrogen from the air in the soil, and nitrogen consumers. Those that cannot perform this function. But use what nitrogenous compounds are already in the soil. The former are generally the most important because they increase the supply of this important element of plant growth. The most expensive to buy and the one most easily lost from the soil.

The principal nitrogen gathering crops are clovers, vetches, peas, cowpeas, and soy beans. The consumer crops are buckwheat, rye, cowhorn, common turnips and dwarf essex rape. Often these crops are sown together to perform both functions at the same time. One favorite combination is rye and winter vetch. Another is buckwheat and crimson clover. Sometimes all four are sowed together in July, after an early vegetable crop has been harvested. Buckwheat plants are killed by the first frost, and winter will kill crimson clover. The vegetable matter these crops develop will be just as good as if alive when turned under. Rye and vetch will probably live through the winter, must be dug or plowed under before they get 8" high or the job will be difficult and the effects may not be as good as if the plants were more succulent.

When fresh or rotted manure is available, it is highly advantageous to apply liberally just before a cover crop or a green manure crop is turned under because the bacteria these contain will help break down the buried plants and thus make their plant food material more quickly available to the succeeding crops.

For best results, the soil temperature should be at least 65 degrees and have moist conditions following plowing under for best decomposition.

Choice of the green manure or cover crop will depend on whether or not an increased supply of nitrates is desired in the soil. For summer sue cowpeas, soy beans, velvet beans, and summer vetch. For fall and winter, use crimson clover, hairy or winter vetch, and Canada field peas.

Sweet clover has notable value as a green manure, especially on heavy soils because of its deep rooting habit and the abundance of its foliage. However if the soil is acid it may fail unless lime or superphosphate is applied shortly before seeding. Also it may fail if 'unscarified' (machine scratched) seed is sown late - after the ground has become dry in spring. Such seed gives best results when sown in late fall or on the snow during winter. In these cases, the plants et an earlier start than the weeds which they choke out. Scarified seed cannot be safely used in this way because it germinates too early.

HERBS: See; http://www.greatdreams.com/herbal_healing.htm

Wild foods for survival. These are links to:

http://www.indianspringherbs.com/wild_food_contents.htm

[Acorns](#)

[Alfalfa](#)

[Amaranth](#)

[American Beech](#)

[American Elder](#)

[Arrowhead](#)

[Asparagus](#)

[Blackberries](#)

[Lamb's Quarters](#)

[Milkweed](#)

[Mint](#)

[Muscadines](#)

[Passion Flower](#)

[Paw Paw](#)

[Peppergrass](#)

[Persimmon](#)

<u>Black Birch</u>	<u>Plantain</u>
<u>Black Walnuts</u>	<u>Puffballs</u>
<u>Bull Thistle</u>	<u>Quickweed</u>
<u>Burdock</u>	<u>Redbud</u>
<u>Butternut</u>	<u>Red Mulberry</u>
<u>Cattails</u>	<u>Rose Hips</u>
<u>Chestnuts</u>	<u>Sassafras</u>
<u>Chickweed</u>	<u>Sheep Sorrel</u>
<u>Chicory</u>	<u>Shepherd's Purse</u>
<u>Cleavers</u>	<u>Spicebush</u>
<u>Coltsfoot</u>	<u>Stinging Nettle</u>
<u>Dandelion</u>	<u>Sugar Maple</u>
<u>Daylily</u>	<u>Trout Lily</u>
<u>Elecampane</u>	<u>Violets</u>
<u>Evening Primrose</u>	<u>Wild Blueberries</u>
<u>Ground Cherries</u>	<u>Wild Carrots</u>
<u>Groundnuts</u>	<u>Wild Ginger</u>
<u>Hickory Nuts</u>	<u>Wild Onions</u>
<u>Honewort</u>	<u>Wild Strawberries</u>
<u>Jerusalem Artichoke</u>	<u>Winter Cress</u>
<u>Kudzu</u>	<u>Yellow Dock</u>
	<u>Yellow Nut Grass</u>

HUNTING WEAPONS - Guns/ammo/bows and arrows/ traps, etc.

A .22 caliber rifle will kill anything up to a deer.
Have 500 rounds of .22 hollow point bullets.

For larger animals - have a 30-39 or a 30-06 shotgun with at least 200 shells.

Bow and arrow is an excellent weapon.

Carry a sharp hunting knife also.

Hunting:

Squirrels - 150 to 200 a year feed 12 people. (Fall and winter hunting)

Rabbits - 150 to 200 a year feed 12 people. (Winter hunting only)

Pheasant

Grouse

Wild Turkey

INSECTS

Be aware of ticks, mosquitoes, and ants, and the diseases they carry.

Be watchful for Lyme disease from ticks. Also Rocky Mountain spotted fever.

Fleas can also carry disease

Find a natural insect repellent. Marigolds give off a scent that bugs and mosquitoes do not like.

Relieve itching: Use a cotton ball to dab mosquito and other bug bites with white vinegar straight from the bottle.

Repel Mosquitoes: Tie a sheet of dryer sheets through a belt loop when outdoors during mosquito season.

Mosquito bite relief: - Rub some onion juice on the bite. Smells, but works!

Insect Repellent: Make a solution of mint oil and rubbing alcohol, place in a spray bottle and spray yourself before any outings, the mint acts as a natural deterrent for most insects.

Bee sting relief - combine a little baking soda and water to form a paste...dab on bite.

Ants:

Keep a small spray bottle handy, and spray the ants with a bit of soapy water.

Set out cucumber peels or slices in the kitchen or at the ants' point of entry. Many ants have a natural aversion to cucumber. Bitter cucumbers work best.

Leave a few tea bags of mint tea near areas where the ants seem most active. Dry, crushed mint leaves or cloves also work as ant deterrents.

Trace the ant column back to their point of entry. Set any of the following items at the entry area in a small line, which ants will not cross: cayenne pepper, citrus oil (can be soaked into a piece of string), lemon juice, cinnamon or coffee grounds.

Ants on the deck? Slip a few cut up cloves of garlic between the cracks.

Cockroaches

It is a little known fact that roaches like high places. If you put boric acid on TOP of your kitchen cabinets (not inside), if space allows between ceiling and cabinets, the roaches will take the boric acid to their nests, killing all of them. Boric acid is toxic by mouth - keep away from children and pets.

Catnip is a natural repellent to cockroaches. The active ingredient is nepetalactone, which is non-toxic to humans and pets. Small sachets of catnip can be left in areas of cockroach activity. Catnip can also be simmered in a small amount of water to make a "catnip tea" which can be used as a spray to apply around baseboards and behind counters. This natural repellent should only be used in homes without cats!

Keep a spray bottle of soapy water on hand. Spraying roaches directly with soapy water will kill them.

In an empty one pound coffee can, place 1 or 2 pieces of bread which have been soaked thoroughly with beer. Place in areas known to have roach infestations.

Leave bay leaves, cucumber slices or garlic in the affected area as deterrents.

The fruit of the Osage orange tree, the hedgeapple, is a natural roach repellent. Leave one hedgeapple per room for effective deterrence up to two months. You can learn more about hedgeapples for pest control at hedgeapple.com.

Non-toxic roach traps are commercially available. Inspect regularly.

Fleas

Citrus is a natural flea deterrent. Pour a cup of boiling water over a sliced lemon. Include the lemon skin, scored to release more citrus oil. Let this mixture soak overnight, and sponge on your dog to kill fleas instantly.

Add brewer's yeast and garlic, or apple cider vinegar, to your pets' food. However, it is not advisable to use raw garlic as a food supplement for cats.

Cedar shampoo, cedar oil and cedar-filled sleeping mats are commercially available. Cedar repels many insects including fleas.

Fleas in the carpet? The carpet should be thoroughly vacuumed especially in low traffic areas, under furniture, etc. Put flea powder in the vacuum cleaner bag to kill any fleas that you vacuum up, and put the bag in an outdoor garbage bin.

Trap fleas in your home using a wide, shallow pan half-filled with soapy water. Place it on the floor and shine a lamp over the water. Fleas will jump to the heat of the lamp and land in the water. The detergent breaks the surface tension, preventing the flea from bouncing out.

Mosquitoes

The most important measure you can take is to remove standing water sources. Change birdbaths, wading pools and pet's water bowl twice a week. Keep your eavestroughs clean and well-draining. Remove yard items that collect water.

In a New England Journal of Medicine study, oil of eucalyptus at 30% concentration prevented mosquito bites for 120.1 minutes, while Bite Blocker with 2% soybean oil kept bites away for 96.4 minutes. (the eucalyptus oil must have a minimum of 70% cineole content, the active therapeutic ingredient.) Citronella, a common alternative to DEET, performed poorly, warding off bugs for only 20 minutes.

If you're using the barbeque, throw a bit of sage or rosemary on the coals to repel mosquitos.

An effective natural bug repellent can be made using garlic juice. Mix one part garlic juice with 5

parts water in a small spray bottle. Shake well before using. Spray lightly on exposed body parts for an effective repellent lasting up to 5 - 6 hours. Strips of cotton cloth can also be dipped in this mixture and hung in areas, such as patios, as a localized deterrent.

Neem oil is a natural vegetable oil extracted from the Neem tree in India. The leaves, seeds and seed oil of the Neem tree contain sallanin, a compound which has effective mosquito repelling properties. Neem oil is a natural product and is safe to use. Neem oil is also an excellent skin moisturizer and highly regarded for its wound healing properties. Look for new Neem Oil-based commercial products on the market. The website, nutraceutic.com, is one source.

Planting marigolds around your yard works as a natural bug repellent because the flowers give off a fragrance bugs and flying insects do not like.

Campers often report that the very best mosquito repellent is Avon Skin-So-Soft® bath oil mixed half and half with rubbing alcohol. Another recommended insect repellent is Vick's Vaporub®.

Thai lemon grass

(*Cymbopogon citratus*) is a natural and effective mosquito repellent. It contains the natural oil, citronella, which is safe and effective; in fact, lemon grass citronella is considered more effective than true citronella as an insect repellent.

You can buy Thai lemon grass at garden centers and supermarkets, and it grows readily into a clump about 15" across and about 2ft tall. To use as a mosquito repellent, break a stalk off from the clump, peel off the outer leaves, until you find the scallion-like stem at the base. Bend the stem between your fingers, loosening it, then rub it vigorously between your palms - it will soon become a pulpy, juicy mass. Rub this over all exposed skin, covering thoroughly at least once. You can also make a tincture using alcohol, for spray applications. Plantings around the patio will also help repel mosquitoes.

Flies

Use mint as a fly repellent. Small sachets of crushed mint can be placed around the home to discourage flies.

Bay leaves, cloves and eucalyptus wrapped in small cheesecloth squares can be hung by open windows or doors.

Place a small, open container of sweet basil and clover near pet food or any open food in the house.

A few drops of eucalyptus oil on a scrap of absorbant cloth will deter flies. Leave in areas where flies are a problem.

You can make your own flypaper with this simple recipe: Mix 1/4 cup syrup, 1 tbsp. granulated sugar and 1 tbsp. brown sugar in a small bowl. Cut strips of brown kraft paper and soak in this mixture. Let dry overnight. To hang, poke a small hole at the top of each strip and hang with string or thread.

A plastic bag filled with water is an effective fly deterrent

Moths

Cedar chips in a cheesecloth square, or cedar oil in an absorbant cloth will repel moths. The cedar should be 'aromatic cedar', also referred to as juniper in some areas.

Homemade moth-repelling sachets can also be made with lavender, rosemary, vetiver and rose petals.

Dried lemon peels are also a natural moth deterrent - simply toss into clothes chest, or tie in cheesecloth and hang in the closet.

Earwigs

Diatomaceous earth is a safe and effective way to control earwigs in the home. One application in key spots (bathroom, baseboards, window frames) can be a long-term repellent.

To trap earwigs, spray a newspaper lightly with water, roll it up loosely and secure with a string or rubber band. Place on the ground near earwig activity. The next morning pick up and discard the paper in a sealed container.

Another method to trap earwigs is to take a shallow, straight-sided container and fill it half full with vegetable oil. Clean the trap daily; the oil can be re-used.

Silverfish

Silverfish prefer damp, warm conditions such as those found around kitchen and bathroom plumbing. Start by vacuuming the area to remove food particles and insect eggs. Silverfish can be easily trapped in small glass containers. Wrap the outside with tape so they can climb up and fall in. They will be trapped inside because they cannot climb smooth surfaces. Drown them in soapy water. The best preventive control is to remedy the damp conditions.

Wild cherry trees encourage peach borer and tent caterpillar.

Elms are breeding quarters for canker worms

Wild roses foster rose chafer

Red cedars are alternate hosts for rust disease of apple and quince

IRRIGATION

Whether or not to irrigate depends on the character and drainage of the soil, topography, crops, temperatures, costs, time of application, water supply, quantity of water needed, relation of irrigation to tillage methods, and perhaps most of all with the differences (timeliness and untimeliness) of rainfall.

In arid regions, irrigation is a necessity, it includes dams, reservoirs, canals, ditches, flumes, furrows, and other features that have to do with supplying, conducting and applying water to immense tracts of land at about ground level of the fields.

Some form of overhead irrigation is applicable to every conceivable condition. It may be either stationary or portable, hand operated or self-operating, laid on or preferably raised above the

surface to suit local conditions. Its first cost in any case is not much greater than an equivalent of hose and nozzles but it will last almost indefinitely, whereas hose usually must be replaced in two or three years.

The nozzle throws a stream 1/32" in diameter and the stream of water breaks fall about 40' away with no wind.

To irrigate vegetables and berries the best way is to place straight lines of pipe 50' to 70' or 80' apart depending upon the pressure and with nozzles at 4' intervals. They may be laid on the ground but will work better if raised.

When placed on the ground, they are easy to step over, when 6' high, are less likely than tall ones to be shifted by winds, more convenient and easily removed and replaced for plowing and digging.

For small gardens, one line may be made to serve by having it in readily portable sections. Each line may be connected with a hydrant by hose or have its permanent supply pipe with a gate valve and a turning union to control the water distribution. For convenience, however, a water motor is far better than a handle because the whole area will be sure to get an even distribution of water.

Overhead irrigation in some form has the great advantage over all other styles in its applicability to every type of soil, in every elevation, every size of garden or field. As the water is evenly distributed in minute drops it sinks slowly in the soil without puddling or baking and neither seeds nor plants are injured. Also the gentle showers cleanse foliage and encourage healthful, vigorous development.

High temperature (90 degrees or above) which usually accompany summer droughts deplete the supply of soil moisture and increase the water requirements of plants.

The chief sources of water for irrigation are ponds, reservoirs, artesian wells and municipal water supplies. Shallow rooted crops, such as radishes and onions, usually require more frequent applications of water than do tomatoes or carrots.

Light and frequent watering is inadvisable; applications of less than 1/4" is considered enough for seed beds and young vegetables and from 1/2" to 1" for maturing crops.

As soon as the irrigation season ends the machinery should be overhauled, the pipes thoroughly drained before winter, and repairs made when necessary. Before starting in spring the pipes should be thoroughly flushed out to get rid of any loose rust particles. Repairs and overhauling should not cost more than ten dollars annually for a system of one to four or five acres. If properly handled, the engine and the pump should last for 12 to 15 years and the piping still longer.

The initial outlay for equipment, exclusive of motor and pump is estimated at \$400. The equipment can be depreciated for tax purposes. The item of repairs is practically nil.

Temporary wilting such as affects plants on hot days, is not necessarily a symptom of moisture

deficiency. Plants will recover from such wilting if sufficient water is in the soil. But if they remain flaccid until early morning. They indicate permanent wilting, so water should be applied promptly for if the wilting is allowed to continue the quality and succulence of the crop is likely to be seriously impaired and the yield greatly reduced.

If porous hose is preferred, the supply pipe is located at the higher end of the field and a pressure of 15 to 20 pounds to the square inch maintained in the porous lines. Old fire hose can serve as temporary water supply. Hose may run up hill. A better distribution may be secured by having it run down. Lengths of 600' have worked well. Especially when heavy weight canvas is used near the source and lighter at the distal and when the current is up grade and the reverse when it is down.

Hose may last up to three years, longer if treated with a solution of one gallon asphalt paint. 1/2 pint of kerosene and gasoline thoroughly stirred before applying either with a brush or by soaking and running through a clothes wringer to squeeze out the excess. It must be dried for 24 hours at least before using.

In use the hose is merely laid between the crop rows the water turned on until enough has been applied, then moved to the next place. Soil conditions and methods of tillage will decide the width of effective distribution.

KITCHEN

Food preparation should never become routine. These are basic procedure to ensure a healthy kitchen, especially when you are serving other people.

1. Wash hands thoroughly before any food preparation.
2. When drawing water from pipes, always let it run for a minute before filling the glass. This removes any dangerous mineral elements from the pipe itself.
3. Always thoroughly wash poultry before preparing it. Wash all counter surfaces with which the meat has come into contact. Likewise, wash anything you've touched with your meat contaminated hands. Thoroughly wash your hands when you are done.
4. Never use a wooden kitchen block or cutting surface. Food particles remain in the cut surfaces and breed germs.
5. Wooden kitchen utensils retain food particles that can also breed germs. Use teflon or stainless steel - never aluminum or wood.
6. Store chopped onions and garlic in glass containers or jars. Plastic containers will retain odors.
7. An open box of baking soda placed in the refrigerator will help to absorb odors.
8. Wash all fruits and vegetables before eating.
9. Wash can lids before opening. Otherwise, dirt particles will contaminate the contents

during opening. Also, rodents have been known to skitter across stocked foods either in the manufacturing plant or in private cupboards, these critters may have left more than dirt particles behind in the wake of their passing.

10. Before eating, mentally thank your food for the give-away of its life force. (Native Americans did this long before Christianity came along)
11. Allow enough time for meals. Never eat when rushed or upset. Mealtimes should take place in a relaxing and pleasant atmosphere.
12. If you use teflon coating baking utensils, replace them whenever the coating is broken through or worn off.
13. Clean tops of salt and pepper shakers daily.
14. When washing forks, clean well down between the tines.
15. Keep pets off kitchen surfaces. Remember where those little paws have been.
16. Never leave leftover food out after the meal has been concluded. Take the time to properly store it away.
17. Keep all foods covered. If you leave out your stick of butter, be sure the dish has a cover. Flies lay their eggs in food. Such exposed foodstuffs can be contaminated by various sources, including airborne particles.
18. Always use a clean spoon each time you taste-test your cooking. This is not good kitchen hygiene.
19. Frequently examine all household plants in the kitchen. They can become infested with bugs without your noticing.
20. If you wash and dry utensils by hand, be sure there is a separate dish towel and hand towel. A towel that people wipe their hands on should not be the same one used to dry the clean dishes. Take out clean towels daily.
21. Remove all cellophane wrapped grocery edibles from original store packaging right after bringing them home. Fresh fruits and vegetables will rot faster if left wrapped.
22. Never refreeze any edibles.
23. Don't purchase or eat green skinned potatoes.
24. Don't store medicines in cupboards near or above the stove.
25. Keep a fresh raw potato handy for accidental kitchen burns. By immediately placing a slice of potato on a burn, the burning sensation will be alleviated. Taping the potato over the injury will help to heal the wound.

26. Keep a fire extinguisher in the kitchen. Make sure it's rated for kitchen-type fires. make sure everyone knows how to use it. do routine refresher sessions with the family members.
27. Never serve pink poultry. If it's not opaque white after cooking, then it's underdone. All meats need to be thoroughly cooked.
28. Give ice trays a routine washing with soap and hot water.
29. When the freshness of an edible is in doubt, throw it out.
30. Never use strong cleaning solvents in the kitchen. Harmful vapors can be absorbed by foodstuffs. Simple baking soda is a wonderful cleansing agent in most kitchen cases.
31. Keep a bar of antibacterial soap in the soap dish on the kitchen sink. Rinse soap after every use. Bars of soap should never look dirty, nor should their dishes.
32. Never cook when you're upset. You're an accident waiting to happen.

LAND PURCHASE

In choosing the farm, it is essential that not the total area conveyed by the deed or contract be considered, but the area available profitable use. Any additional land may be a liability instead of an asset, since often the returns do not pay the taxes.

Another factor is ease of cultivation. Steep land is hard to cultivate with machinery, time consuming by hand. The physical condition of the soil should receive first attention. High grade farms can get into poor condition through a few years of mismanagement. To correct such damage usually takes several years.

Shallow soil is a liability. It would be cold and wet in spring, the water table close to the surface. Later it dries out rapidly and bakes hard. It is quickly affected by drought. Test for depth with a soil augur.

Check natural drainage of soils. Do ponds form in areas of the fields during wet weather?

How are the buildings arranged with relationship to the fields?

Is the area large enough to produce a profitable volume of business?

Is the soil suited to the crops to be grown or the animals to be reared and to produce a profit?

Are the natural resources with respect to sales of products favorable to the development of a profitable business?

to be of productive value land, buildings, and equipment must contribute their quotas of income.

Factors that contribute to farm income are:

Profit on the uses of the land.

Profit on the working capital.

Profit on the personal and hired labor employed.

HOW TO TELL WHETHER THE LAND IS GOOD

Beech, sugar maple, hickory, black walnut and white oak trees of large size indicate rich land;

white pine, scrub oak, and scrawny trees of most species are typical of poor land;

extra thrifty willows, poplars, and alder and elder bushes suggest too much water and probably need draining.

Healthy green weeds indicate good land

Pale, sickly colored, scrawny weeds, are eking out a miserable existence.

An abundance of sheep sorrel - small plants with spear-head-shaped leaves with a tart taste especially if the plants are puny, the land is not only short of plant food, but is acid, a condition not favorable to most cultivated crops, but easily corrected with lime.

Ox-eye daisy, wild carrot, and mullein in abundance and poorly developed, indicate lack of humus as well as fertility and prove that the land has been badly mismanaged, for these plants cannot stand either rich soil or rational tillage.

If the farm looks to be mismanaged, but the neighbors land has good crops, there will be the hope that it may be reclaimed and made as good as the best in the vicinity.

A slope toward the south is almost always the warmest so is best suited to greenhouses, hotbeds, and coldframes, outdoor early crops and poultry raising.

A slope toward the north retards growth, but less likely to be destroyed by frosts when a cold snap follows a warm spell in winter and early spring.

LIVESTOCK

BUFFALO - economical to raise, meat, hides.

CHICKENS - eggs, meat, feathers

Hen care time is small in comparison with the other advantages. They destroy countless insects, and use unwanted vegetable waste, they supply eggs whose freshness cannot be impeached. An occasional chicken dinner, and the production of appreciable quantities of highly concentrated manure. For the majority of people, the profitable limit is 100 chickens. Master those before trying a greater quantity.

If you want poultry for meat, choose Brahmas, Jersey giants, Langhams, Cochins, or

some other 'meat breed.'

If you want eggs, regardless of meat, choose Leghorns, Spanish, Minorcas, Anconas, Andalusians.

If you want eggs and meat, choose Rhode Island reds, Plymouth Rocks, Orpingtons, or Wyandottes.

Hatching your own chicks is inconvenient and results are unsatisfactory. To buy chicks if at all possible. Artificial brooding avoids many of the disadvantages of natural brooding, especially lice, exposure to unfavorable weather, time, labor, and annoyance incident to hen brooding. In portable brooder colony houses, it is easy to manage 300 chicks and to be surer of developing more uniform pullets.

Egg production has been profitably increased by using electric light to lengthen the hens' working day to 12 to 14 hours between the equinoxes of September and March, through encouraging the fowls to consume larger quantities of food.

The quality of product may be maintained by sanitation, cleanliness of the poultry houses, runs, nests, gathering the crop at least twice a day in autumn, winter, and spring, four times a day during warm weather, keeping them cool and away from direct sunlight to avoid deterioration, discarding all males except for breeding purposes so as to prevent fertilization and consequent rapid deterioration. Market eggs at least twice a week.

Eggs need to be checked for blood spots, graded as to size, weight, shape, cleanliness, infertility, and freshness.

Eight out of twenty-two farm flocks produce more than 48 eggs a year per hen. The most liberally fed flocks produce the most eggs. The best birds to keep are the ones which produce the most eggs. Egg production can be increased by systematic breeding, careful culling and careful feeding. Quick maturing Rhode Island Reds make more profit in eggs because they mature faster.

To find out what cost your eggs are, you must keep track of all costs including purchase of chicks, feed, water, labor, replacements, inventory depreciation, interest, auto, upkeep of buildings, taxes, lighting, miscellaneous.

DUCKS - eggs, meat, feathers

Ducks are a highly specialized business in which many single farms raise from 10,000 to 50,000 ducklings each season and place them on the market within 10 to 12 weeks of hatching. The only water these ducklings are allowed to have is what they drink. None but the breeding stock is allowed to swim.

GEESE - eggs, meat, feathers

Goose growing is not similarly specialized because apparently geese cannot be so closely confined but must have ample grass range on which to graze. Relatively small

flocks are kept on pasture with no access to lake or river until goslings are at least half grown, through they may have a small pond in which to swim.

TURKEY - meat

Turkeys, unless reared by modern methods are the most disappointing, perhaps because the poults are delicate until they have passed a stage of development called 'shooting the red'. The turkey hen is the worst fool of a mother imaginable. Unless she is confined in the morning and during rainy weather, she will lead her brood through wet grass with the results that they get chilled, weakened and die. The young turks are also subject to diseases which are highly fatal. So turkeys should be left to specialists.

RABBITS - meat, wool, hides

Rabbits and Belgian Hares, kept not as pets but for meat are often profitable where most of the feed is produced on the place and where the marketing conditions are favorable. They require good housing, exercise paddocks and preferably summer range on clover and alfalfa. during winter they need good hay as they are prolific breeders and grow rapidly they soon begin to return profits to the man who takes good care of them.

SHEEP - meat, wool, hides

Sheep have no place on a small farm. They require grazing range, cheaper, rougher, untillable land. The should be kept in moderate to large sized flocks in order to have enough high grade wool to interest buyers. Similar comments apply to lamb raising for meat.

GOATS - good for milk, cheese (some have excellent wool for carding and knitting)

Where there is untillable grass land it is sensible to keep a milch goat or two than a cow or sheep. The animal is hardy and will largely shift for itself, except in winter when only the most ordinary shelter and feeding care is necessary. It's milk is highly nutritious and is specially noted for cheese making.

LLAMA - ALPACA - meat, wool (these animals produce excellent knitting wool, that knitters pay a high price for.

Llamas or alpacas can be a good addition to the farm or ranch-an alternative livestock enterprise that fits well into a diversified farming operation. Marginal pastureland, not prime farmland, is suitable for raising llamas and alpacas with some supplemental feeding.

One major drawback is that when starting to raise llamas or especially alpacas, the initial capital investment in breeding stock is fairly substantial. Llama or alpaca farming is considered a high-risk enterprise by banks and other agencies. A large owner investment is usually needed to obtain a loan.

There may be some tax advantages for breeders holding animals for over five years. For more information on these tax advantages, see <http://www.ctalpacas.com/invest.html> or discuss it with a tax accountant.

There are four types of lama (the genus name is spelled with one 'l'). They are the llama, the alpaca, the guanaco, and the vicuna. All are members of the *Camelidae* family. Modified ruminants with a three-compartment stomach, they have cloven hooves and chew a cud like sheep and cattle. The llama and alpaca have been domesticated in South America for many centuries. The llama, the largest of the types, is used as a beast of burden, as a fiber source, and as a meat source in South America. The alpaca is used primarily for fiber production, but is also used as a meat source in South America. The guanaco and vicuna are wild animals that are protected from hunting in South America

COWS - milk, butter, cheeses, cream, hides

Average 4,200 pounds of milk per cow up to 20,000 pounds or more a year.

Steers - stay outside all winter as well as non-milking cows

Cows require a minimum of an acre of pasture to support her, even though she will get much of the waste from vegetable and other crops. In addition to this, more or less area will be needed to supply her with fodder even when hay and grain are bought. On a property with less than 10 acres, it would take far too much land to feed her to warrant keeping the usual cow for her milk and manure.

Another objection is the work connected with milking twice a day and tying someone down to this duty. Neglect or postponement of milking may be fraught with danger or impairment of her ability as a milker. If not to the animal herself. Furthermore, she should always be milked by the same person, not a series of experimenters who differ in their natures and abilities as milkers. For thus she may acquire bad habits.

If there is sufficient land to keep a cow, and where she can be properly managed, she is a highly desirable animal to have. She will produce amply milk for drinking, cooking, butter, and pot cheese for the family and manure of special value in the vegetable growing but profitably consume large quantities of usable produce and waste. Thus converting worthless material into profit.

Holstein is the favorite, but they are poor foragers. When pastured, their yields of milk decrease. Jersey, Alderney, and Guernsey are famous for the richness of milk, but they require more care in stabling, dieting, and handling than other cattle. Guernsey is the hardiest. The best all round cow is the Ayrshire. They are hardy, active, wonderful foragers, abundant producers of milk, which, though is less rich or copious is more palatable than any other.

HORSES - working on the farm - riding in place of a vehicle

Any other purpose is a waste of space, time, and money on an old-fashioned farm

where the purpose is to make money and survive. Horses just for riding pleasure as a pet is not the purpose for this paper.

A large part of the time for plowing, hauling, cultivating and other work. Work horses can be kept only if they are used consistently. Otherwise a rented tractor or team of horses may be done more economically, and the light work done mostly with a garden tractor or a wheelhoe. Hauling is more expeditiously done with a truck.

HOGS - meat, hide, grease for cooking

Best fit for the conditions on a small farm. He requires a smaller area than any other - merely a pen and some range, with shade and a good wallowing place. Except to provide him such items and good and ample feed, he demands no unreasonable time or attention. He is the most wonderful of all domestic animals as a converter of waste and worthless fruit and vegetables, even makes weeds into profitable meat.

PIGS - meat, hide, grease for cooking, etc.

It is not profitable on the small farm to breed pigs, but it is highly so to buy young ones in the spring when only a few weeks old, feed them until fall and then convert them into pork, sausage, headcheese, scrapple, liverwurst, pickled pigs feet, and other toothsome delicacies. Rendering lard is also easy to do. By purchasing in spring and butchering or selling in the fall, the farmer may be relieved of the care and cost of winter feeding - 4 to 6 months.

Brood sows - 10 to 15 - Some have 3 or 4 babies. Some have 14.

Save the sows that have the most babies.

Prime price for selling is 135 to 200 pounds. They reach that weight at 6 months old. Over or under weight is less money.

They eat grass, grains, corn, skim milk separated from cow milk, pumpkin, rye, oats, all cooked together is a treat for pigs.

Good grade pigs whose sire are of almost any breed, cost but little more to buy, much less to feed, grow rapidly, fatten well, and when dressed out, are almost all meat.

Razorbacks eat ravenously, grow slowly, fatten poorly if at all and when slaughtered, consist largely of hide, bones, and offal.

MANURES

The first business of the farmer is to grow crops such that the land becomes better rather than poorer. The best manure is stable manure because as it decays it supplies all its mineral elements, but also nitrogen and humus. It is in partially digested form and is full of micro-organisms which help to unlock other plant food held in the mineral compounds of the soil. This manure may be fresh, or dried and pulverized from the store.

Soils fertilized by the fresh product will grow better crops than those enriched by chemical

fertilizers. Unless the latter is supplemented by humus in some way. the best results will be had by plowing under the manure in the autumn. It will then decay by spring. In heavy soil, you will not notice the difference the first year because the leaching effect of rain does not work as well in heavy soil. In sandy soil, the plant food in manure becomes available as fast as the plants can take it up. For vegetable crops, a two-horse load of manure spread out on 2,500 square feet (50' x 50') is a liberal amount. though half this quantity will give fair results and twice as much will be best for crops grown for their foliage or stems - celery, spinach, cabbage, cauliflower, etc.

Always, fresh and rotted manure should be applied to the surface before digging or plowing, dried, pulverized manures. Afterwards, and then thoroughly raked or harrowed in the surface inch or so of soil. Liberal dressings of dried manures are: sheep 100 lbs to 1000 sq. ft. Poultry and pigeon, 75 pounds; horse 100 to 150 - cow - 150 - 200.

The crude materials upon which the bacteria more consist of dead organic matter such as plant roots, leaves, stems, animal wastes, and the bodies of dead animals. These must break down into nitrates before the plants can use them. If insufficient raw materials is lacking, you must add nitrate commercially.

Rotten manure is better than fresh because of the acid. Unless soil conditions are favorable to decay - warm, moist and aerated - action will be slow. The physical condition of the soil, must, therefore, be made favorable by such processes as plowing, harrowing and, where feasible and necessary, but irrigation, organic matter such as manure and green manure plowed under when nature (as in straw and corn stalks) or when the soil is dry will decay much less quickly than if it is succulent and when the soil is warm and moist.

10 to 20 tons of stable manure to the acre annually is necessary to produce good vegetables, otherwise you must add commercial fertilizer. More fertilizer increased productivity, especially in heavy soils.

4 tons of manure = 500 pounds of fertilizer.

8 tons of manure = 1000 pounds of fertilizer.

12 tons of manure = 1500 pounds of fertilizer.

On light soils, turn under weed growth. Always use whatever manure is available on the farm. (Low cost - high yields)

MULCH

Mulch is an application of manure, or any other loose material such as leaves spread upon the soil surface to protect the roots of newly planted trees, shrubs, tender plants. Today, it is extended to include earth kept loose by surface tillage to check evaporation.

You can use buckwheat hulls, shredded corn stover, chopped straw, or granulated peat moss. For mulching trees, and berry plants, coarser material may be used - marsh hay, straw, leaves, and corn stalks.

Also used is black paper spread upon the ground between or through which young plants may

be grown. It sheds water into the soil, conserves water in the soil by checking evaporation, increases germination, greatly reduce or even eliminate weedings and cultivation, increase soil temperature, hasten maturity, increase yields, and produce larger high quality, and cleaner crops.

Paper should not be used on low value crops. It usually eliminates weeds in the covered area, and thus conserves the moisture and fertility they would use. It also cuts down the cost of cultivation.

NUTRITION FOR SURVIVAL

Needed: Vitamins, Minerals, Carbohydrates, Proteins, Fats

1. Iron, calcium, and phosphorus are often lost due to the practice of discarding the peels of fruits and hulls of grains.
2. During cooking, much of the mineral content of foods goes into solution and is thrown away with the cooking liquid.
3. The most important minerals for nutrition is man are iron, salt, iodine, calcium, and water.

See: <http://www.greatdreams.com/diet.htm>

<http://www.greatdreams.com/health.htm>

The healthiest diet is a 'raw food' diet.

Carbohydrates serve to provide energy for muscular contraction and other body functions. They are most rapidly utilized source of energy and normally supply two-thirds of all man's energy. Carbohydrates in a diet reduce protein metabolism, and therefore large amounts of meat are not necessary.

Proteins supply the building blocks (amino acids) for construction and regeneration of the body tissues. In the absence of sufficient carbohydrates, some proteins can be converted into dextrose to yield energy, but the amount of such conversion is limited. Protein has the advantage of being available from vegetable and animal sources.

Fats are oxidized by the body to liberate heat and supply.

Energy similar to that of carbohydrates, stored body fat along with stored carbohydrates in the form of glycogen, provides an immediately available source of energy. Fat due to its high caloric value, supplements the amount of carbohydrate that must be used by the body for energy and to some extent, like carbohydrates, conserves protein for use as building material rather than a source of energy. You cannot support yourself on fats alone. Fat itself, does not supply other nutritive substances such as vitamins, which might be found in foods containing protein or carbohydrates. A small amount of fat is necessary for proper nutrition and health. Fat is needed for the brain to work well, as does carbohydrates. a deficiency leads to renal (kidney) lesion and other disease symptoms.

All foods have a polarity. all foods when ingested, either are acid producers or alkaline producers. An individual with too much acid in his system will experience all manner of adverse physical effects and frequently develop colds and flu. Conversely, an individual whose system is mostly alkaline will experience good general health and well being.

There should be a delicate balance between acid and alkaline in the food intake. the ideal balance should be 15% acid to 85% alkaline.

Following is a small listing which should be helpful.

ACID PRODUCING FOODS

- Animals fats
- Vegetable oils
- Egg whites
- Legumes
- Nuts (except almonds)
- White flour (pasta/noodles/white bread)
- Starches
- Chocolate
- Cane sugar
- Alcohol
- Artificial sweeteners
- Beef (steaks, burgers, liver, heart)
- Pork, ham, ribs, bacon
- Cranberries

ALKALINE PRODUCING FOODS

- Dairy products (yogurt, cheese)
- Fruits (except plums)
- Vegetables (except legumes)
- Seafood/shellfish
- Poultry
- Sunflower seeds
- Almonds
- Hard grains/wheat
- Honey
- Maple syrup
- Egg yolk
- Raisins
- Granola
- Herbal Teas

ANIMAL ORGANS

If you are frequently susceptible to colds, your system may be too acid. Mullien teas and/or fresh alfalfa sprouts help equalize the chemical imbalance factor and aid the system in returning

to a healthful alkaline condition.

VEGETARIANISM

Four legged animals have higher spirits than to the lesser beings of fin and feather. Some people think that being a strict vegetarian is the only way to be spiritual, and that if you eat meat, you cannot be spiritual. This is not true. One who eats merely vegetables is no more spiritual than one who eats fish and fowl. It is in the practice of your life where you show your level of spirituality.

DIETARY GUIDELINES

1. Eat only fruits and vegetables that have been grown in your local region. Honey processed locally is especially helpful for the purpose of alleviating symptoms or building up immunization against seasonal botanical allergies.
2. Eat only vine ripened products. Those products shipped green from far away producers do not have the same level of nutrition than those grown locally.
3. Never combine sugars with starches. This combination creates difficulty in digestion, resulting in constipation, flatulence, and an irritated colon.
4. Never consume starches with meats. This produces a long digestive time, thereby causing an invasion of the bloodstream and organs by fermenting elements. (This means no sandwiches) (This means no meat and potatoes)
5. Never mix citrus fruits or juices with milk. This sours the milk, resulting in poor nutrient assimilation and aggravated digestive functioning. (This means if you have cereal with milk, don't drink juice too.)
6. Never eat fried foods. Broil, braise, bake, boil, stew, or steam. Never, never, fry.
7. Never cook in copper or aluminum cookware. Metal elements leach into the foods. Cast-iron cookware is recommended because the iron mineral enter the food and benefits the system. This also applies to mixing bowls and the like. Throw out all uncoated aluminum and copper kitchen utensils. They look pretty, but they are deadly. (This also goes for Teflon coated pots and pans)
8. Never consume preservatives or artificial additives. These will prove to be cancer producing agents, especially nitrates and certain colorings. Don't use MSG.
9. Never eat light colored chocolate. (Dark chocolate has been found to be beneficial)
10. Steam all fresh vegetables. This is the only cooking method that retains the total nutrient value.
11. Limit all sugar substitutes and chemically decaffeinated drinks. Virtually all sugar substitutes are a detriment in some to the body. Decaffeinated products raise the the levels of serum cholesterol in the bloodstream.

(Use the plant Stevia for sweetener)

12. Avoid egg whites. The yolk is the most nutritious part of an egg. It is alkaline. Eat the the yolk and leave the acid white alone.
(The cholesterol in the yolk has cells too large to enter the arteries)
13. Never eat pork, beef, or animal organs. (Too much cholesterol)
14. Inspect eating utensils. Never eat with utensils that have chemical spots on them.
Or whatever else might be on them.
15. Never eat when you are upset, nervous, or angry. These negative emotions have a direct effect on your digestion. Negative mental attitudes constrict the digestive tract and cause rhythmic contractions of the intestines and colon, resulting in cramps, diarrhea and/or severe indigestion. Rather, you should wait to eat until your emotions have calmed down.
16. Limit sweets. Instead, munch on sunflower seed, yogurt, granola bars, (without the chocolate chips) raisins, almonds.
17. Limit alcoholic beverages.
18. Be aware of your body's acid/alkaline balance.
19. Drink eight glasses of water/fluid per day.
20. Get at least eight hours of sleep at night and analyze your dreams.
21. Accept others as they are. Accept life.
22. Love yourself.

ORGANIC GARDENING: See: <http://www.greatdreams.com/garden.htm>

PERMACULTURE: See: <http://www.greatdreams.com/garden.htm>

OZONE

Don't use spray containers with chlorofluorocarbons as propellants

Don't use styrofoam

Don't buy halon fire extinguishers

Don't buy clothing that has to be drycleaned

Don't use air conditioning unless absolutely necessary

Make sure A-C's are running well and don't leak.

Make sure your car is well maintained so it doesn't pollute the air.

Keep car tires properly inflated so you don't waste gas

Use your car less - carpool - walk - bicycle

visualize the ozone layer whole and complete. Ask the spirit keepers of the ozone to help make your visualization a reality.

PROPANE STOVES

SAFETY OF:

DO: Carry fuel in recommended containers.

DO: Check the temperature of your stove's fuel tank by feeling with your hand. If the tank is too hot to hold, reduce the stove's heat and/or pour cold water on the tank.

DO: Carry extra stove parts and tools, and extra pressure cap and leather pump washer is usually enough. You will need a small screw driver and pliers.

DO: Empty the fuel in the stove at the end of each season. Impurities in the fuel left in stoves can cause malfunction. This is the most common cause of long term stove failure.

DON'T: Loosen or remove the filler cap of a gasoline stove when the stove is burning. This could result in an explosion.

DON'T: Re-fuel a hot stove. There may be sufficient heat still available ignite the gas fumes.

DON'T: Set over-size pots on stoves. Large pots reflect excessive heat back to the fuel tank, which may cause over-heating of the stove. Run stove at 3/4 of maximum heat output if you use oversize pots.

DON'T: Use automotive gasoline (regular or unleaded) in a stove designed to burn white gas.

DON'T: Start a stove where there is insufficient ventilation. A closed tent or room is not sufficiently ventilated.

DON'T: Set stoves on sleeping bags or tent floors. There's enough heat generated at the base of some stoves to melt or warp these items.

DON'T: Run stoves at full power for extended periods of time. The tank may overheat and cause the safety valve to blow.

DON'T: Fill gasoline or kerosene stove more than 3/4 full. Fuel won't vaporize if there is insufficient room for it to expand.

RECYCLING

Recycle all paper

Recycle everything possible

Save all used clothing either for other people or for rags

Reuse all jars and bottles where possible

Use old newspaper to make logs for fireplaces

Wrap the newspaper tightly to make the logs

Use paper scraps for kindling

Keep a bucket alongside the toilet and in the outhouse for used toilet paper. This can be burned in the woodstove

Newspaper and old telephone books can be used for toilet paper. Save in bucket for burning.

Use cloth diapers on babies - no disposable diapers

Don't buy products with excessive packaging

Buy products in reusable containers

Buy rechargeable batteries

Use cloth shopping bags - don't get plastic bags

When changing the oil in the car - take to a recycling center
Keep tires properly inflated to save on gas and the tires
When camping or picnicing, pick up litter even if it is not yours
Do not use harsh chemicals for cleaning - use biodegradable soaps
Snip plastic rings from soda cans to prevent harm to animals
Keep all appliances in good condition to use less energy

SEEDS

Asparagus: cannot be expected to yield a paying crop until the 3rd or 4th year, but when well fertilized, it should yield annually for at least 10 years. When well fed, it could produce for 40 years.

Tomato
Lettuce
Corn
Peppers
Radish
Onion
Cabbage
Melon (Don't plant melons and pickles together if you're going to save seed for next year because they cross pollinate.)
Bean (Green & Northern & Kidney)
Cilantro
Collard
Kale
Lettuce
Horseradish (winter hardy)
Pumpkins (can be fed to pigs as well as people food.)
Pickles of various sizes
Cucumbers
Parsley
Dill
Celery
Brussel Sprouts
Cauliflower
Bay
Basil
Eggplant
Zucchini
Carrot
Wheat
Oat
Rye
Garlic
Herbs
Basil

Sunflower
Catnip
Leek
Cotton
Squash
Okra
Peas
Rhubarb
Popcorn
Ginseng
Gourds
Watermelon
Potato
Sage
Poppy Seed
Pineapple

Strawberries

When growing strawberries, you can train the best bearers to produce runners, so that only the best strawberries are allowed to grow. These can be planted in a new bed the following August. Within a few years, you will have the best strawberries you can possibly grow. Strawberries generally bear their most profitable crop when they are 14 or 15 months old. When a second crop is borne by the same bed, it is not only lighter and inferior to the first, but, because of necessary hand weeding, it costs relatively more to produce and often brings lower prices.

SEPTIC SYSTEM

A properly installed septic tank and not abused should never need to be cleaned out during the lifetime of its builder. Unlike the cesspool (which fills up and must be replaced or cleaned periodically) the first cost and the only cost is the setup.

Household wastes must be disposed of and where there is no municipal sewage system. The septic tank is generally the most satisfactory way to dispose of it. It is generally 5' or 6' deep, 1 1/2 times as long as the breadth, receiving only household sewage and liquid waste from the kitchen, which enters by an inlet pipe submerged which has a slow and regular flow to the outlet pipe 2" lower than the inlet pipe. The liquid which flows from the tank is but little discolored and carries no visible solid matter. The best method of its disposal is through ordinary drain tile laid as subirrigation. The cover, which must be tight and at least a foot above the scum which forms on top of the liquid in the tank, should be removable at least in part, so as to allow access to the inside when necessary.

Sewage enters from the house through a 4" glazed, tight jointed sewer pipe which should be as short as convenient, with a slope of at least 2 1/2" and not more than 10" in 10'. It is undesirable to have the incoming stream enter the tank violent and thus disturb the contents. The fitting used at the entrance should be an elbow, a tee or a Y-branch, so it's opening will be submerged, and so the incoming stream will be deflected downward. The direction of flow may be aided by plank baffle boards. A similar pipe fitting, placed at the discharge end 2" lower than

the inlet pipe should be vented to allow gas to escape.

As the sewage flows slowly through the tank, the solid matter settles to the bottom and leaves an almost clear effluent which is disposed of by subirrigation. Bacterial action within the tank converts most of the solid matter into liquid gases, thus reducing the volume until only a trifling amount is finally left at the bottom.

Though the effluent is generally clear, it must be disposed of carefully or it may give offense or even cause disease if it comes in contact with a water supply.

The subirrigation tile should be not less than 3' in diameter and laid in a trench 18" to 24" deep, with open joints, protected of the top with tarred paper to prevent the entrance of soil or sand which would tend to clog the pipe. the slope of the tile in the disposal bed should not exceed 1/2" to the foot. This requires careful laying to secure best results. A 1" x 4" grade board nailed to stakes driven in the bottom of the ditch will be helpful in obtaining a uniform slope.

By using boards 12' long and setting the down stream and 3" lower than the end toward the tank the correct grade may be easily made. The board is to be left permanently in position. The length of drain (which may be laid out in several branches) depends on the character and ability of the soil to absorb drainage. Light, loose soils require about 30' to each person who uses the tank; heavy, clay soils as much as 75' to the person. Careful installation will be repaid in care-free operation of the disposal bed. In heavy soils, it is sometimes necessary to dig the disposal trench a little deeper. Back -filling with gravel or cinders about 6" before the tile is laid, thereby providing a more efficient absorption area. In such cases dry wells may be used to advantage.

A blueprint of a tank and construction details can be gotten from "Portland Cement Association, Boston, Massachusetts.

MIXING THE CEMENT

The concrete mixture must be water-tight, capable of resisting the attack of sewage. A trial mixture is recommended: "Portland Cement", 1 bag, sand, - 2 cubic feet pebbles - 3 cubic feet, water - 5 gallons (when the sand is dry - 6 gallons when the sand is dry Mix until the mixture is plastic and jelly-like. If too stiff, add a little cement and water. to make subsequent batches uniform, vary the amount until the proper proportions and consistency is attained.

Gravel as dug from the pit is usually too much sand and should be screed through 1/4" screen. Sand should be free of loam or decaying vegetable matter. Sand can be washed to clean it.

Never connect a septic tank to house eaves or other excessive flow of water. Never connect factory wastes to the tank. Locate the tank as near the house as possible so as not to chill the water unnecessarily during cold weather. The exit drain may be extended as far as necessary or be branched. Always make the drain pipe from the house to the tank with vitrified tile with joints tightly packed in concrete or melted tar to prevent leakage. If the sewage is to contain grease, install a grease trap at the beginning before the tank, so it may be removed. Do not use this sewage water to water growing vegetables, garden truck, berries, or low growing fruits, or to water vineyards, or orchard crops when windfalls or fruit lie on the ground, and no effluents, sludge, or screening shall be permitted to enter ditches, r pipes which may be used to irrigate

such crops, nursery stock, cotton, and field crops may be watered with effluent provided that no milk cows are pastured on the land while moist with sewage, or have access to ditches carrying such.

SHRUBS

Currants, begin to yield usually, during the 4th or 5th year.

Gooseberries, begin to yield during the 4th or 5th year.

Rhododendron

Raspberry: generally start to pay during the 3rd year and bear annually for 6 to 10 years.

Blueberries

High Bush Cranberry

Blackberry: generally start to pay during the 3rd year and bear annually for 6 to 10 years.

Dewberries: same as blackberry

Grapes

Fig

Dates

Mulberry

SOILS

If you have soil that man has never touched and interfered with, you could doubtless maintain fertility and crop production indefinitely at a high standard. However, the land on which you have to deal probably has been so injured by man's abuse that its ability to grow desirable plants is at a low ebb.

Soils may be classified according to their principal components - clay, sand, and innumerable combinations of these with vegetable matter (humus). Clay - blue, red or yellow - though rich in mineral elements is undesirable without modifications by the presence of the other two components. It is sticky, hard to dig or plow, and so dense that water and air penetrate it with difficulty and its surface contains far less actual plant food material, allows water to rush through, carrying with it and wasting soluble plant food material added by nature or man.

Combinations of these extremes with vegetable matter form 'loam' of many grades popularly known as heavy clay loams, light clay loam, sandy loams, etc.

Loams are more desirable for plant growing than are either clay or sand because on the one hand, they are easier to work, more porous and less likely to bake than clay, and on the other hand are more retentive of moisture and plant food than sand.

Clay may be lightened by plowing under a two-horse load of fresh horse manure to each 2,500 square feet of area in late fall, leaving the clods and furrows unbroken just as turned up by the plow so frost will break them, adding a 1 inch layer of sifted coal ashes during the winter and in spring, giving a surface dressing of lime (about a pound to 10 square feet, 250 to 300 pounds per acre.

Coarse soil has got the best value for truck farming, mainly due to the size and the quantity of sand particles. When coarse, the soil is 'quick' because it drains rapidly, warms up quickly and

permits early sowing. Such soils are warm all season long and thus favor early crop maturity. Because of their open texture, they require large quantities of humus, lavish feeding and irrigation.

Medium sandy loams are not quite so early but retain water and plant food better and are more productive. Fine sandy loams though later than the preceding are usually best of summer vegetables and strawberries. For latest crops, silty and clayey loams are often most valuable of all. Their fertility is also more easily and economically maintained.

The sandy loam is the best bet for vegetable farming.

When soil need humus, we can put on liberal dressings of manure, muck, peat, leaf mold, or other vegetable material or by growing green manures. When leaves and other forest litter decay they become 'leaf mold', a material highly valued by flower growers, but not as much by vegetable growers and farmers. The annual deposit of leaves or needles and other waste in populous pine woods is about a ton and in hardwoods probably twice as much to the acre. But only does it gradually change to humus, but it adds appreciable quantities of plant food to the soil.

A farmer who applies the rakings of one acre of heavy oak woods to an acre of field crop land during three years, secured corn and cotton which increased his monetary returns about 16 times than that of an acre which was not treated.

Soil color is another test for fertility, usually, black soil is rich and a dark soil productive in ratio to its darkness but black color is due to combinations of organic matter and lime.

Brown color generally indicates soil acidity, due to the presence of iron oxide. In such soils, the organic matter, even though abundant, is not saturated with lime. When iron oxide is in the 'free' state, the soil is usually yellow when the quantity is small, or red when the quantity is large.

Red and brown soils are highly valued, because their condition indicates that they have good drainage, and other favorable growth conditions and proves the presence of abundant material which will both supply and retain plant food.

White and light colored soils are deficient in important components - organic matter and clay - and contain excess sand. Hence they cannot absorb and retain water but permit such rapid drainage that the soluble components of manures and fertilizers rapidly disappear and are wasted in the drainage.

Some sandy soils cannot ever be treated enough to make them grow vegetables well.

The loss of soil fertility due to sheet erosion is probably far greater than from gullying. Though it is a thin layer of the most fertile soil is removed from the surface with each heavy rain. Because the material is removed gradually and because subsequent cultivation destroys all evidence of erosion, the ill effects often go unnoticed until after much damage has been done.

Sheet erosion is greatly reduced when the land is kept covered with a crop as much of the time as possible. By using a cropping system that provides for a crop curing most of the seasons

when the greatest erosion is likely to occur, much can be done to reduce the disastrous effect of sheet erosion.

Small grain crops give more effective protection than do others, such as corn or other cultivated crops. Red clover forms a sod and protects the land more effectively than a crop like soy beans and thus gives not only more efficient but more extended protections from washing. Sweet clover or alfalfa used in the cropping system gives much the same protection as red clover.

On steepest lands, permanent grass pastures or meadows should be used at much as possible since they form a most effective protection against erosion. The less sloping ground should be grown to small grains or kept in such rotations that the land will be protected by a crop at least 3/4 of the time. It is only on relatively level upland or bottom land that cultivated crops can be grown more or less constantly without serious loss from erosion, even in such cases, the land should be rotated with other crops since continuous cropping is seldom the best practice on any soil.

SOLAR PROBLEMS

Be aware of sun, solar storms, and solar radiation and their effects on the earth. Protect yourself from the dangers that come from solar radiation.

TOOLS

Picks
Spades
Pitchforks
Shovels
Hoes
Gooseneck Hoe
Grub Hoe
Hand Tools
Weeder/Router
Fishtail Weeder
Asparagus Knife
Weed slicer
Pruning Shears
 both short handle and long handle
Tool Sharpener
Pruning Saws
Long handled pruning cutters
Cold Frame
Peat Pots
Plastic plant pots
Watering Cans
Hoses & Connections
Compost containers
Sprayers
Star harrow & Hoe

Oscillating Hoe
Rakes - metal and bamboo
Bulb planter
Hammer
Nails - various sizes
Screws - various sizes
Saws - several sizes
Screwdrivers - various sizes
Levels
Hand push mower
Brooms - several types
Dustpans
Plant stakes
Trellises
Work boots - more than one pair
A large supply of extra nuts, bolts, nails, screws,
wrench set, 200 of feet of nylon rope, duct tape,
electrical tape

TREES

APPLE

Apple orchards rarely provide a paying crop in under 7 years, more often 10 to 15 years. Many varieties bear satisfactorily only in alternate years. So they will rarely yield more than 15 crops in 37 to 40 or 45 years from planting.

Baldwin apples are notorious for 'off' and 'on' years.

Yellow Transparent, Oldenburg, and Wealthy are famous for regular annual bearing.

Trees should have regular feeding

During the summer, cull all inferior and worm-infested specimens, which would have to be discarded anyway at or after harvest. This diverts the plants food from the inferior fruits to flower-bud formation for the following year, and enhances the size and quality of the remaining specimens. Thirdly it distributes the fruit bearing area more evenly both over the trees and over the years. The later thinning can be used for vinegar making, and prices of the large apples at harvest will bring higher prices.

ORANGE

Oranges, lemons, and grapefruit require five years to bear profitable crops, but unless injured by frost, they usually bear well annually and for many years.

PEACH

Peaches begin to be profitable in the 4th or 5th year. Some trees may be profitable for 20 years.

But most growers only count on 10 or 12. Though the peach would naturally bear every year, an annual yield cannot be counted upon because cold winters and spring frosts often destroy the buds, flowers, or newly formed fruits.

NOTE: Wild cherry encourages peach borer and tent caterpillars - cut them down.

LEMON: See orange

LIME: See orange

GRAPEFRUIT: See orange

BANANA - only viable in warm climates or in greenhouses

WALNUT

PECANS

HICKORY

ALMONDS

CHERRY - RED and PIE

Rarely become profitable before 5 years, are more regular annual bearers than apples and pears, and are naturally longer lived than peaches - 15 to 20 years for well managed sour cherries and plums and 30 years or more for sweet cherries. Their main objections to them are the cost of picking and their proneness to brown rot of the fruit and foliage.

CHESTNUT

PLUM

PEAR

KIWI

HAZELNUT

BUTTERNUT

MAPLE - See: <http://www.greatdreams.com/maple.htm> for how to tap these trees.

GENERAL NOTES: Beech, sugar maple, Hickory, Black Walnut, and White Oak trees of large size indicate rich land; White Pine Scrub Oak, and scrawny trees of most species are typical of poor land; extra thrifty willows, poplars, and Alder, and Elder Bushes suggest too much water, and probably need of drainage.

Elm trees are breeding quarters for canker worms, Red Cedars are alternate hosts for Rust disease of Apple and Quince - these can be cut down if you are growing other trees for profit.

WATER SUPPLY

BAD:

Where the primitive rain barrel furnishes family needs and rears mosquitoes

Where shallow cisterns must have holes chopped in the ice and from which the water has to be hauled up in an oaken bucket, or hauled hand over hand, by rope and pail, or a 'chain pump';

Where a deep, unprotected cistern was built without provision for drainage, and has to be cleaned of nasty sludge, dead toads, mice, and other gruesome ingredients every summer.

Where there was a 'filter cistern' which could not be cleaned, because of inaccessibility.

Where an attic tank filled direct from the roof collects leaves, soot, dirt, and bird droppings.

Where the water has to be pumped by hand either to a tank in the attic or a pressure tank in the cellar.

Well water include brownish or whitish scale that forms in kettles because of lime content, magnesia or iron. This scale is a poor conductor of heat, thus making necessary the use of excessive fuel. It also clogs 'waterbacks' in kitchen stoves and 'heating coils' in furnaces, often causes leaks and sometimes explosions. Lime and magnesia form 'curc' or 'sludge' with soap and washing powders and spot or stain clothes being washed, and water that contains iron turns brown upon standing, stains pails, and makes clothes yellow or stained when laundered.

GOOD:

Rain water is superior to most well and spring water and is such a money saver that every farm home should have a supply, of for no other purpose than that for the family washing. It requires no softener, uses less soap, and is pleasanter to work with than even the best water that has come in contact with the ground.

To obtain an adequate supply of rain water for household use, provision must be made to collect it, to eliminate contaminating materials by screening and filtering to provide storage and to make the water readily usable. The roofs of buildings are the most common sources of supply, but they are subject to various types of contamination and since water is a good solvent, it is quickly polluted. Hence, in collecting a rain-water supply the roof must be thoroughly cleaned by rain before any water is allowed to collect in the cistern. also the downspouts always should be disconnected from the cistern at regular intervals. they should be inspected to make sure they are uncontaminated.

The filter cistern is used chiefly to remove foreign matter carried in suspension in the rain water. Coarse material such as leaves is first removed by a screen before the water reaches the filter proper. The filter should have surface area enough for sedimentation before filtration; be so constructed that sediment and the filtering material may be easily removed.

The commonest type is the downward flow or gravity style which is better than the upward flow style with drains. This is a concrete box filled with alternate layers of coarse gravel, charcoal

and sand from which a drain discharges the water when not flowing into the cistern and which drains the filter when not in use. A screen removed all coarse material and a hose or a few pails of water will cleanse the inlet side without disturbing the cistern supply. the easily removable water-tight top is for removal and renewal of the filtering material.

Storage may be above or below ground. Where there is little chance of freezing, the former is satisfactory and where the roof is high, the tank may be placed high enough to give pressure without pumping. Such tanks may be of wood, galvanized iron, etc. and placed inside or close to the house whose roof collects the water. the commonest storage for rain water is the masonry underground cistern. the walls must be made water-tight to prevent leakage and to avoid the entrance of seepage water. Never should it be located near trees because the roots might crack the walls. Trouble of this kind is most likely to occur with plaster-on-earth masonry. cylindrical and rectangular cisterns are both satisfactory. by providing a pipe at the lowest point of the bottom, practically all the sediment may be siphoned out when there is a drain t a lower level or pumped out otherwise.

The cistern should be of a size to serve the amount of people who will use it. 5 gallons daily per person is a fair estimate where amply hard water under pressure is also available for other purposes. Far more should be provided where there is enough roof area to collect it.

33% of the rainfall estimate should be deducted for leakage, evaporation, and to wash the roof. enough storage capacity should be provided to store water that falls during the rainy season to meet needs during the dry time. Better still to have sufficient storage for six months.

Chemical solutions to remove the color from rain-water off of roofs is:

1. dissolve $3/4$ pound of baking soda in 1 gallon of water.
2. dissolve 1 pound of alum (potassium aluminum sulphate crystals) in $1/2$ gallon of water. (Filter alum may be used) use $1/2$ pound to $1/2$ gallon of water.

Determine the amount of water in the cistern by multiplying the area by the actual depth of water (1 cubic foot contains $7\ 1/2$ gallons) for each 30 gallons of water, add $1/2$ pint of solution #1 and stir. Next add $1/4$ pint of solution #2 for each 30 gallons and stir again. Allow 24 hours for the precipitate to settle to the bottom, after which the water above the solution will be clear.

Sludge accumulation in any cistern and should be removed at the time of year when the water is at its lowest point.

In spite of precautions, leaves, mice, toads or insects sometimes get into cisterns and produce bad odors. The proper thing then is to clean the cistern thoroughly. In dry years, when this waste of water may be serious the water may be deodorized and made satisfactory for all uses except drinking by treatment with chloride of lime which burns up the odor. Mix about a tablespoon in a porcelain glass or crockery dish with two or othree tablespoonfuls of water. rub the lumps with a spoon, then add about a quart of water. Stir thoroughly and pour the solution into the tank, mixing it intimately with the cistern water by stirring with a long board or a paddle. If this treatment is not adequate, use a second or third dose if necessary. This chemical is harmless unless used in excessive amounts.

SPRING WATER

When higher than the point of use, pipes placed below the frost line may be laid so the water will flow by gravity. Though the system usually works well, trouble is sometimes met by the gradual reduction and finally the stoppage of the flow. Generally this is because air has collected. Little by little from bubbles in the water and lodged in some irregularity of the pipe. The less the grade, the smaller the pipe, and the slower the flow, the greater the likelihood of such trouble because the bubbles will not be carried down by the current but gradually work back to a high spot.

To avoid difficulty, the pipe should not be smaller than 1". Stand pipes may be tapped in at high spots to allow the air to escape. The entrance to the pipe should be 6" or more above the bottom of the spring well and be protected by a screen to prevent anything but water getting in. The pipe itself should be laid as straight as possible, with neither dips, rises, nor avoidable angles. All joints should be well leaded, and screwed tight so as to cover all the threaded parts.

Water supply parts and supplies can be obtained from local plumbers, such as water rams, regular well pumps, etc.

WATER NOTES

Be aware of water usage.

Each toilet flush consumes about 5 gallons

Each minute of water running in a sink - 3 to 5 gallons.

A ten minute shower uses - 50 gallons

Each washing machine load - 30 to 50 gallons

Avoid excessive toilet flushing:

 If its yellow - let it mellow

 If its brown - flush it down

Put a bottle filled with water or a displacement object in toilet to conserve water

Put hard rubber plugs for sinks that leak

Get an effective water filtration system

If bottled water is used, use recyclable containers

If you have a lake or lagoon, practice keeping the water and shores clean

Get a low-flow device for shower, tub, and sinks

Use whatever gray water you can

 Wash a baby with biodegradable soap. Do hand wash in it, then water plants and flower with it.

Take a bath in 5 gallons of water

Use a sponge bath whenever possible

Use a basin for washing and rinsing dishes

Do not let the water run when washing dishes

WINDBREAKS

Windbreaks are not meant to be wind-stops. This can be responsible for other problems.

Windbreaks can cause their lee to be colder than would be the case without their protection.

Because of this, damage may accompany spring or fall frosts. If so, the windbreak has become a windstop. This condition can be prevented by spacing the trees far enough apart to allow reduced air movement through them, by reducing the number of trees or shrubs already planted, or by pruning out some of the branches.

Windbreaks are not necessarily wasted space. If the trees are conspicuous when in flower or in autumn colors, especially when evergreens are included among them, they have an ornamental as well as a practical use that makes them doubly valuable. In other cases, if we plant Shadblow (or Juneberry) Mulberry, Hackberry, Highbush Cranberry, and other fruit and seed bearing trees and shrubs we may attract birds away from our cultivated berries and yet gain all the advantages of their aid in keeping down insects in our gardening and fruit growing.

Profitable trees for windbreaks are: English Walnuts, Almonds, Apricots, Fig, Filberts, Black Walnut, Northern Pecans, Highbush Cranberries, Elderberries, Raspberries, Blackberries, and Sugar Maple.

Windbreaks reduce evaporation of water from the soil and transpiration from the crop plants, particularly the leaves. Thus they mitigate the effects of drought, and winter injury which often follow a dry summer and a wet autumn.

The harmful effects of winter are lessened by the retention of leaves and snow on the ground, for in the lee of a windbreak, the ground freezes less deeply than where they are blown away, so the roots of the fruit trees, bushes and other plants are less likely to be injured because of their presence.

They also greatly enhance the physical comfort and noticeably reduce the cost of maintenance of man and animals whose living quarters they shield from winter winds. Houses are protected, require less fuel to maintain comfortable temperatures than do adjacent similar ones not so favorably placed, and animals so sheltered need less food to keep them in condition favorable to the production of work, milk, eggs, and flesh.

Windbreaks should not be planted before careful study has been made of the local conditions, especially with respect to air, drainage - the flowing of cold air from higher to lower levels. This must be done to prevent cold spots or 'pockets'.

Planting should be not less than 50', preferably 100' away from the principal area or buildings to be protected. Its influence extends for a distance equal to 20 times its height; that is, trees 30' tall influence the force of wind for 600' on the level. On the protected or lee side of a windbreak of 10' to 30' is a calm zone where snow drifts during wind-driven storms. Hence the necessity of planting far back from buildings.

The length of the planting will depend on the area to be protected. It should extend at least 50' beyond the last building, or feed lot area. Where you have an L-shaped lot, greater protection may be had by extending the planting 100' to 125' northerly or westerly beyond the buildings.

Conifers are the most suitable for windbreaks. Hardwood trees are the least recommended. Conifers should be at least 3 years old, 4 year or 5 year for white spruce, Douglas or Balsam Fir, White Pine, Norway Spruce, Chinese Elm, and Red Maple go in light loams, White Spruce,

Balsam Fir, Arborvitae, Cottonwood, Ash and Sugar Maples for heavy loams and clays.

Two or more species of trees in a windbreak provide a more compact growth of foliage than when only one is used, especially where spruce and arborvitae are used with open growing White or Norway Pines. The possible loss of one species from a future insect or disease epidemic will thus not destroy the windbreak. Russian Willow or Cottonwood may be used to give early protection while the slower conifers are becoming established in their lee.

Where there is enough space, three rows are desirable, otherwise two. For all suitable trees except Arborvitae, the rows should be 8' apart and the trees 6' asunder. Arborvitae should be 6' to 8' and the trees 4' asunder. On sandy soils where growth will generally be slow, the trees should be staggered in rows, on fertile ones they should be planted in checks because in 12 to 15 years, they will crowd at 6' to 8'. Then by removing each alternate tree in each alternate row, the remaining trees will be left in staggered positions at wider spacing. Where arborvitae is planted, the original spacing should be maintained. thinning will not be necessary.

Windbreaks depend for their usefulness largely on the care they receive for the first five or six years after planting. Keep poultry and livestock out by fencing them. A mulch of straw, marsh or salt hay or sawdust 2" deep and 12" in a radius around each tree should be applied within a few weeks of planting. This will hold soil moisture and help to smother weeds. Sod growth around the trees must be prevented.

To avoid heaving by frost, a winter mulch 4" to 6" deep of straw with a low percentage of manure should be applied after the ground is frozen and preferably after a light snow is on the ground there will be no danger of mice nesting in it. It should remain on the ground the following summer to add fertility to the soil, prevent evaporation of moisture and smother weeds.

You may grow sunflowers in several rows along the windbreak the first few years to protect young seedlings and the sunflowers can be used to feed chickens or use for silage. (People like to eat these too) Conifers in a windbreak should never be pruned. It is desirable to retain those branches that grow near the ground. If trees have enough sunlight, they will maintain their foliage throughout most of their lives.

A NEWS ARTICLE - ADDED 8-2-06

Back(yard) to the Land
Family grows its meals on tiny urban lot
Justin Clark
Natural Home magazine
Saturday, July 22, 2006

<http://tinyurl.com/g78ug>

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For most people, eating organic means a trip to the local whole-foods store and, often, a hit to their wallets. For the Dervaes family, eating organic requires only a trip to the garden. The family of four raises 3 tons of food each year -- enough to supply three-quarters of their diet and maintain a thriving organic produce business to boot.

Jules Dervaes, along with his three grown children, lives on 1/5 of an acre in suburban Pasadena and cultivates about half the property, or 1/10 of an acre. Given that the average American's diet requires 1.2 acres of farmland per person, the Dervaeses are eating quite well off one-fiftieth of the land the rest of us require.

The California Department of Food and Agriculture reports that most California corn or rice farms produce an annual yield of less than a 1/2-ton per acre and the average bean farm 1/5-ton per acre. The Dervaeses' operation is about 60 to 150 times as efficient as their industrial competitors, without relying on chemical fertilizers and pesticides. "Everybody wants more land," Dervaes says. "We decided to find out how much we could accomplish on this piece of land." Path to freedom

Dervaes had been running a small lawn-maintenance business six years ago when he and his family started their self-sufficiency garden project, dubbed Path to Freedom. They started the garden because of their growing concerns about genetically modified organisms and other potentially harmful additives in mass-market produce. Since then, the Dervaeses have raised everything from asparagus and jicama to kiwis and cotton -- all of it organic.

They've been successful using space-maximizing gardening techniques, including raised earth beds and potted plants that hang between trellised plants. Jules Dervaes' genius lies in his ability to adapt his back-to-the-land vision to an urban environment. Ultimately, he realized that in addition to providing food for his family, this garden also could help sustain them financially if he sold its bounty to local businesses. Rather than competing head-on with larger produce suppliers, the family raises niche products that only a city full of gourmet restaurants could support: nasturtiums and Khaki Campbell duck eggs, for example.

The Dervaeses' garden exemplifies both sustainability and frugality: manure (sweepings from local stables) used as fertilizer, trellises made from old bicycle wheels, planter dividers made from recycled glass bottles and homemade pots-within-pots that save water.

In addition, the family drives one vehicle, a black Chevy Suburban that runs on biodiesel refined from discarded cooking oil provided by local restaurants. The Dervaeses reach out to their community by using their garage to screen environmental films and by holding seminars on going solar.

They also took advantage of Pasadena's home-greening rebates by installing a \$14,000, 2-kilowatt solar-cell system for less than half the retail cost. The family is installing a wastewater reclamation system, a dual-flush toilet and a composting toilet. Already, they rely on hand-crank appliances and a pedal-power grain mill.

Urban gardening tips

"Anyone can do this, if they have dedication," says Dervaes of his wildly productive garden. "Don't be afraid to start small with something like herbs that you know will survive." For aspiring urban gardeners, Dervaes has plenty of advice.

1. Get to know your backyard's ecology. As an example, Dervaes points out a patch in his yard that doesn't appear to be shaded but that feels cool. He uses a canopy with a shade cloth and squeezes out one more round of lettuce in summer.
2. Let natural ecosystems develop. Dervaes recommends exercising patience when aphids invade because the solution already may be in the local insect population. Recalling Path to Freedom's first infestation, he says: "I tried spraying soapy water, but I actually had to let the aphids spread. Their natural ladybug predators needed the aphids to max out before they got to work." Now, says Dervaes, an entrenched ladybug and praying mantis population takes care of most of his pests.
3. Keep a nursery. Dervaes keeps a large workbench with dozens of seedlings that he uses as guinea pigs to help him figure out when to plant. If one type of plant fails, he simply pulls it out and substitutes another. He also rotates plants that like it hot and dry (beans, cucumbers, corn and peppers) with cool crops (kale, mesclun, snow peas).
4. Start a skyscraper farm. Most of the Dervaeses' backyard was initially covered in concrete, so they experimented with multistory container plantings, with each plant occupying its own "story" in the skyscraper (for instance, broccoli, a tall, strong plant, paired with endive, a low-growing salad green. Dervaes plants three or sometimes four crops vertically, using trellises to support vine plants that grow above their downstairs neighbors.
5. Take a holistic approach. "It's so important to feed the soil," Dervaes says. He fertilizes between plantings using a mixture of kitchen compost, bat guano pellets and droppings from his rabbits, ducks and chickens. Every week during growing season, he dilutes 1/4 to 1/2 teaspoon of a kelp fertilizer in a gallon of water and sprays it directly on the plants. (Salad greens, such as lettuce, should not be eaten right after contact with kelp fertilizer, especially without washing, because it can leave a fishy taste.)

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