

FARMSTEAD MAGAZINE

Home Gardening & Small Farming



**How to Make
Great Garden Soil**

See Page 42

**How to Prune
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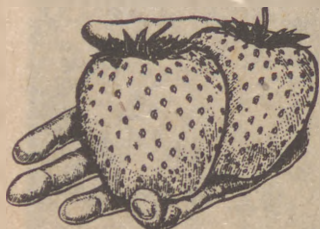
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FARMSTEAD

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Letters

DO PLANTS FEEL PAIN?

Dear FARMSTEAD,

I just read Kim Giglio's letter in the Garden 1980 issue and I was very upset at the attitude she expresses.

First, there is usually one article or idea in a magazine or organization that doesn't go along with my own way of life. Is that any reason to reject the whole magazine or club?

Secondly, as a true animal lover and one-time vegetarian myself, I can sympathize with her ideals. But as a vegetarian, isn't she also picking and choosing which plants or fruits to eat and not eat? Isn't she deciding what plants live or die when she dines on lettuce and soybeans, instead of maple leaves and buttercup blossoms? Aren't plants living and able to breathe and to feel pain? Even though they don't move about freely and meow or oink, do they feel less anguish when they are uprooted or picked and eaten? Especially after carefully planting, fertilizing, weeding and caring for our vegetables, do they feel any less trust in us than the cow does, when we prepare to kill and eat them? Is eating a plateful of alfalfa sprouts, five days old, any worse than eating an egg, five days old, or a veal cutlet?

I respect her stand on vegetarianism, but I feel sorry for her attitude that she is above us omnivores. Every time we raise a forkful of food to our mouths, we are eating something that has died in order that we may be sustained. Plants are no less sensitive than animals when it comes down to dying.

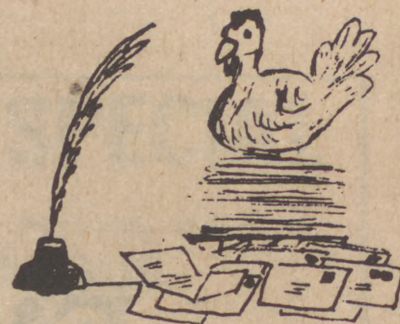
I liked "Thoughts on Killing My Fatted Calf," and I think Farmstead has evolved over the years into an excellent magazine. (Even though sometimes, I may not like certain articles!)

Linda Cohen

MORE THOUGHTS ON KILLING

Dear FARMSTEAD,

Gay Weeks Neale's article called "Thoughts on Killing My Fatted Calf" in your Fall 1979 issue could have been titled: "Hardening Myself Against My Own Feelings." Richard Guches' "Eating Betty, Tom and Susan" in the Winter issue could



have been: "Teaching My Children to Put Down Their Natural Sensitivity." Of course, if one wants to eat meat that much, this stamping out of empathy is quite necessary in order to quiet the conscience and enjoy the meat. The parents raising animals for meat would have their children believe that it is necessary. Of course, anyone who has read Laurel's Kitchen knows that none of this is necessary at all. It's quite possible that to start with, the kids were more right than the parents.

Sarah S. Schellens
 Tenant's Harbor, Maine

MORE ON WOMEN IN FARMING

Dear FARMSTEAD,

As a long time farmer and recently, the director of an inner city community farm, I find your magazine invaluable. But, it is difficult to find on the newsstands. I read your most recent issue and I'd like you to send me that one as the first issue of my new subscription. Thanks.

Please--more, more on women in farming, appropriate technology and other non-traditional areas. The jobs, training and grant money for program development in A. T. are again going to the men. There are many highly qualified women, and women-run organizations with financial needs who wish to work in non-traditional areas and develop training for women in these areas. In the ghettos especially, where women are the majority of the population and the heads of the households, the need is critical. We need your continued support and investigation of these topics. It would be great to see an issue devoted to women in farming and alternative technology and their ideas and the problems they face.

Lynn Rae Carroll
 Director, Our Farm

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CHEMICAL TRESPASS REDRESS

Dear FARMSTEAD,

Before you go pushing for a chemical trespass law, consider these things:

1. Before any chemical used in agriculture is put on the market, the company spends millions of dollars (and this is not exaggerating), on research before it is even put up for E.P.A. approval.

2. The growers who use these chemicals don't just spray any time of the day. They want that chemical to help make a better quality product. Also, at the cost of the chemicals (in some cases, \$14.00 a pound), the growers are not going to waste it.

3. Banning aerial spray or any kind of spray would hurt the economy, putting a lot of people out of jobs starting from the person who does the spraying, to all the people who are hired by the growers.

4. The fruit or vegetable grower is around these chemicals every year. I know of several apple growers who are in their seventies or eighties, and still kicking. If these chemicals were going to hurt anybody, it would hurt them. Interview a few growers and see what their opinion is.

5. We have research centers like Highmoor Farms in Monmouth to guide us along in our use of chemicals.

Tom Fillebrown
Waterford, Maine

Editor's Reply:

In my article on chemical trespass, I was not trying to say we should ban the use of any specific chemical but that we should make the user, the party who profits by the use, strictly liable for the destination of the chemical. If a law making chemical

users more liable for their actions restricts the use or method of application of chemicals, then maybe those chemicals are a bit more dangerous than the chemical company data (for which they spend millions of dollars to apply for E.P.A. approval), might indicate. Most of those millions of dollars spent are spent to see if the certain chemical actually does the job of controlling the certain target weed or insect, and little or nothing is spent to determine long-term health effects.

I hope most growers use care in the application of chemicals. If growers do use care in application and actually believe the chemicals are safe, they should not be frightened by a chemical trespass law.

D.K.

WANT HELP WITH SELF-SUFFICIENCY

Dear FARMSTEAD,

We are a non-profit community organization operating in Victoria, Vancouver Island, British Columbia, Canada. Currently, we've formed a neighborhood gardening club and leased some School Board land on which we're building two solar green-

houses and preparing some community garden plots. The greenhouses were built with materials obtained from buildings which we dismantled. We have a rotovator and mulcher, and have built quick composting drums and stands.

Our purpose in writing to you is to learn of your experiences and experiments with composting systems, viable crops, specific types of seeds, small scale technology and systems you used to obtain people participation. We are interested in receiving any information on this.

Thank you.

Paul Phillips
Victoria, B.C., Canada

Country Craftsmen Wood Stoves

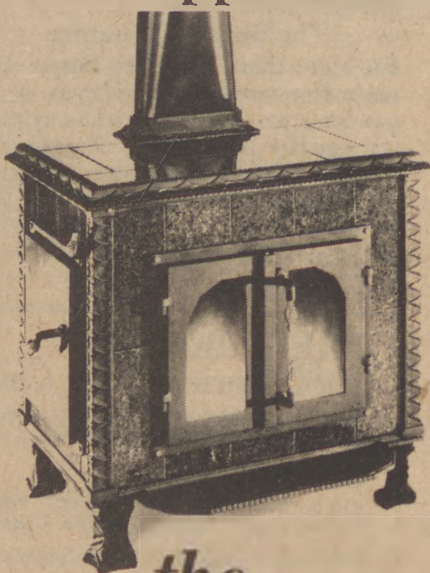
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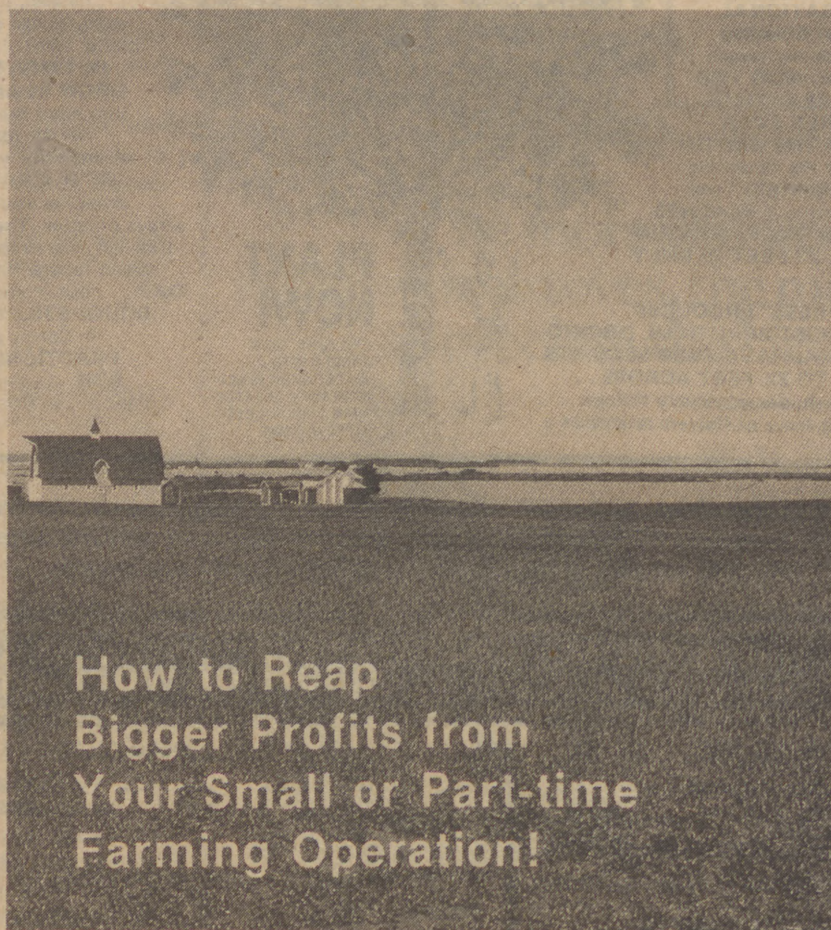
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Christmas Trees, Cattle and Corn

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ASK FARMSTEAD

Last year I grew potatoes under a heavy mulch, and I am not aware that the tubers got any light. Nonetheless, many of them turned green or had green spots on them. The mulch was fresh and partially composting, and I wonder if the heat of composting could have caused the potatoes to turn green? Also, is it OK to eat a potato that is partially green, if the green part is cut off and discarded?

We contacted Willy Erhardt, extension vegetable specialist at the University of Maine at Orono, to help us answer your question. He states that potatoes are actually stem tissue and turn green upon exposure to light. To his knowledge, light is the only factor that can cause green coloration on potato tubers. (Perhaps some light did penetrate the mulch). If the green color is discarded, the rest of the potato can be eaten.

I am going to plant an asparagus bed. How long will I have to wait to harvest it? How do I harvest?

It's best to delay harvesting until the asparagus bed is two years old, and to limit this first cutting to not more than three to four weeks. This allows for better crown development and more productivity for a longer period.

During the fourth and subsequent growing seasons, harvest asparagus spears when they are four to ten inches long. Cut the spears one to three inches below the soil surface. The best time for harvesting seems to be in the morning. It's a good idea to harvest every three days at the beginning of the cutting season, but as the weather warms, it's wise to harvest asparagus daily.

I have 16 black sex-link hens about two years old. They simply quit laying when fall came. I've heard this breed only lays one season. Is this true?

We asked Jan Willems of Mt. Desert, Maine and the author of several poultry articles for Farmstead to answer your question. He says:

"Productivity in most sex-link hens drops considerably in their second and following seasons; it might drop from 80%, during the first year, to around 50-60%, and although the eggs might be larger, it usually does not pay for the feed costs. An extended molt period with the onset of cold weather, might further have limited your egg harvest. I would suggest you buy new sex-link chicks (not necessarily the Black sex-link—which in my experience, tends to be rather aggressive), early this season. And, as soon as they start laying (under right management in about 22 weeks) recycle your old hens to the stew pot. However, with spring, they might, if they are healthy otherwise, still provide you with some eggs. I would guess this would be from March, with possibly eight to ten eggs a day this summer."

Are there any good varieties of ornamental corn suitable for New England and Northern climates?

The latest word in ornamental corn is still in the developing stage.

A Dr. Gerry Dunn, geneticist at the Agricultural Experiment Station at the University of New Hampshire, began a project ten years ago developing an early-maturing, colorful variety of ornamental corn adaptable to New England. According to him, varieties now available may be hurt by a freeze in early October. He wanted to secure a variety which

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would mature in time for the fall tourist trade.

Dunn began with a few ears of colorful corn and crossed it with several early sweet corn varieties and a "flint" type called Gaspe Flint, which may be the earliest maturing corn in the world. This flint type is the corn the Pilgrims encountered in New England. It has very hard and rounded kernels. The pretty corn you buy for fall decorations is this flint or "Indian corn," but the corn the Indians actually grew was probably all yellow rather than many-colored.

Dunn is presently growing corn that contains kernels which are red, white, yellow, purple, blue and striped. He hopes to have a variety of ornamental corn on the market in a year or so, which will combine these colorful kernels with a large, well-shaped, and early maturing ear.

At this time, none of his seeds are available, but the corn he is growing is a "multiple use" grain. Not only is it decorative but the kernels can be ground and eaten. Dunn's experimental variety has a nutty flavor and makes excellent corn bread and muffins.

If you have a little patience to wait for something special, keep on the look-out for "Dunn's New England Multi-Purpose Ornamental Indian Corn."

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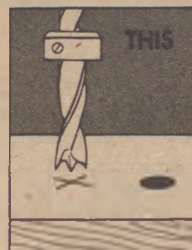
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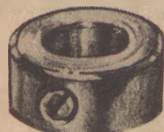
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needles and pains

Acupuncture used alone has been tried and found wanting in the United States as an anesthetic during various operations and during childbirth. But a recent study at the University of Utah in Salt Lake City raises the possibility that electroacupuncture (in which electric current is passed through electric needles) used along with a general anesthetic, may reduce the amount of general anesthetic required.

Nathan L. Pace reported that electroacupuncture significantly lowered halothane (a general anesthetic) in a study using dogs. These findings, Pace said, may encourage further studies in this country, where earlier failures have discouraged researchers from pursuing further acupuncture studies. It remains to be seen, he added, whether the results will justify the extra time and equipment needed. In Germany, there have been two clinical reports in which electroacupuncture was used as an adjunct to general anesthesia.

--Science News

pass the lemon & polystyrene, please

A warning to tea-drinkers: If you prefer lemon-flavored tea and drink it from polystyrene cups, look out. The tea won't hurt you, but the cup might.

Michael Phillips, a researcher at the University of Connecticut Health Center in Farmington, was drinking his lemon tea from a polystyrene cup when he noticed that the interior of the cup was dissolving before his very eyes. Phillips lost interest in drinking that particular cup of tea and decided that the matter warranted laboratory investigation.

Taking 16 polystyrene cups, he weighed them and put boiling water and a tea bag in each one. He squeezed slices of lemon into eight of them, let them steep (stirring frequently) for 15 minutes, then emptied, dried and weighed the cups.

All of the tea-with-lemon cups showed a significant net gain in weight and led Phillips to believe that "the substance in lemon tea may solubilize polystyrene and possibly combine with it chemically," which certainly suggests that lemon tea drinkers are also consuming an "appreciable amount" of the polystyrene container along with the tea. Since polystyrene is carcinogenic in laboratory animals, Phillips suggests drinking lemon tea from china cups—more aesthetically pleasing and less hazardous to the health.

--Science News

btu budgets for buildings

Energy-guzzling homes and offices will become a thing of the past if the Department of Energy has its way. In the works are energy budgets setting the maximum allowable energy consumption for all newly constructed buildings—and even for some renovations. Expressed at btu's allowable per square foot per year, the proposed standards are expected to be issued this month with regional hearings starting in January. Final standards could be in force as early as 1981.

Written as "performance standards," the budgets will be implemented through compliance with redesigned state and local building codes. According to DOE's Archie Twitchell, energy-cost savings should pay back any additional building costs necessary to meet the standard within seven years at most.

--Science News

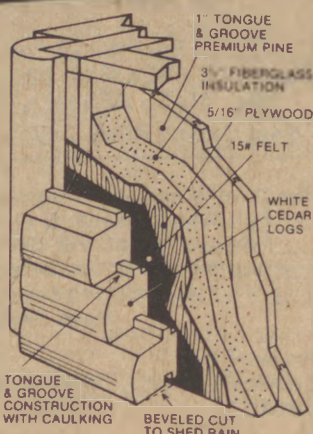
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trees are cool

It may be more energy-wise to plant a tree than to add a few inches of insulation, says a director of the American Society of Home Inspectors. Studies in the Northeastern U.S. have found that strategically locating shade trees can cut home heating cost \$12--106 a year, and cooling costs as much as \$50. Siting a large-leaved deciduous tree on the south-south-western side of your home can equal a half ton of air conditioning capacity,

allowing you to get by with a smaller cooling system and less operating time. Plant evergreens on the north side of your property for effective windbreaks. While species with year-round foliage help out with cooling summer shade, they also block solar gain during the winter. So do your part to cut America's energy use, and get beauty, shade and increased property value to boot: plant a tree!

--Science News

legislating the wind

Both the House and the Senate have passed major wind legislation. The Senate version of the Federal Wind Bill provides loans for private wind energy systems and government purchase of wind systems for Federal facilities.

The House bill calls for cost-sharing demonstration programs for small and large wind machines, with the Department of Energy paying 50% of the cost in the early years of the program. Passage showed good support with a vote of 382--23.

The two versions of the bill will go to a joint House-Senate conference to reach a compromise sometime before the end of this year. The \$100 million is an increase in funding, up from \$67 million in the past year.

The President's recently completed Domestic Policy Review of solar energy indicated that wind energy could provide two to three per cent of the nation's energy by the year 2000. Other Department of Energy Studies indicate wind energy may eventually provide ten to fifteen per cent of the energy used in this country.

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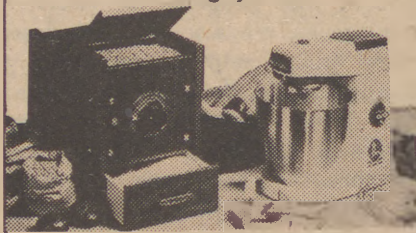
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1980: no shortage of people

The dawn of the 1980's finds the world population growing at a slower rate than that of a decade before but still increasing by 74 million a year, or one million every five days. "Far from being defused, the population bomb is still ticking," reports the Population Reference Bureau, Inc., in Washington, D. C..

Population growth reached its peak of about two per cent annually in the mid-1960's and is now down to 1.7 per cent, according to statistics from a study conducted by the bureau. Global population is more than four billion, compared with two billion 50 years ago; by the year 2000, the total is expected to be close to six billion and the annual increase more than 90 million, despite an expected drop in the growth rate to about 1.5 per cent.

While birth rates have started to decline in many developing countries, "mortality declines are leveling off as the easiest-to-control diseases are conquered," the report states. "As a result, the huge gap between annual births and deaths in the Third World, which set off the post-World War II population explosion, is now narrowing." The report points to China--

which contains more than one-fifth of the world's population--as a "bright spot," where the growth rate has been cut from 2.3 to 1.2 per cent in the years from 1971 to 1978.

fasting increases longevity in rats

Many animal studies have indicated that moderate eating early in life increases life span. Evidence that periodic fasting promotes longevity has been much more convincing. Experiments by Charles L. Goodrich of the Gerontology Research Center in Baltimore indicate that periodic fasting not only increases life span but also promotes more vigorous activity later in life.

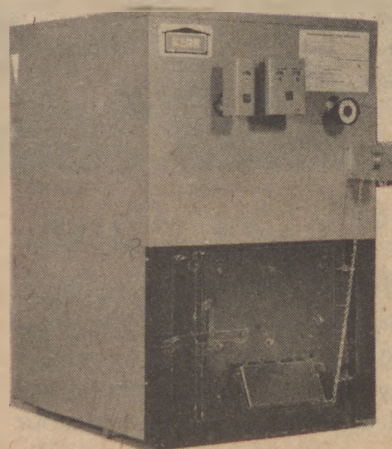
Goodrich took five groups of paired male rats, one control and four experimental groups. Two of the experimental rats were put on an every-other-day feeding schedule, and one of these was allowed free access to an exercise wheel. Two other groups were allowed all they wanted to eat and one of these two was allowed the exercise wheel. Both groups of fasting rats lived significantly longer than the non-fasting rats. Among the free fed rats, the group that exercised lived longer than the group that didn't, but exercise did not increase the life of the fasting rats. The group of fasting rats that had the exercise wheel voluntarily exercised much more later in life than the free fed rats which had access to exercise.

a stratified-charge engine

Texaco Inc. has designed an auto engine that could help solve fuel-availability headaches in decades to come--a stratified-charge engine that without adjustments can run on anything from jet or diesel fuel to high-octane gasoline. Under license, United Parcel Service is developing a kit to convert the GMC 292-cubic-inch six-cylinder gasoline engine used in its fleet of 35,000 heavy-duty delivery vans. For a conversion cost of less than \$2,000 per van, UPS claims the Texaco-designed engine will deliver a 30 per cent increase in the miles per gallon with an accompanying reduction in exhaust emissions.

UPS has already tested one engine and plans road tests for several more. If all goes well, UPS will retrofit 500 vans.

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wind power conference

A first-of-its-kind conference on the potentials of wind energy will be held in Rochester, Minnesota on April 25 and 26. The conference site is the large John Marshall High School in Rochester.

The conference will be unique in that it will offer the audience an opportunity to explore the real and practical uses of wind-generated electricity. Included will be information on the applications of wind power for the home, farm and by industry.

HOW-TO BOOK CLUB

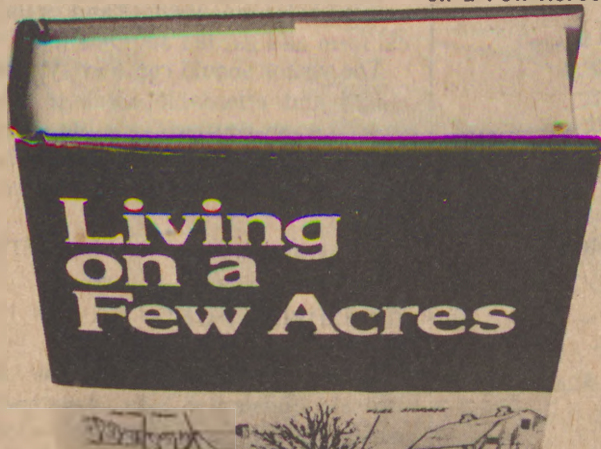
A series of workshops are scheduled which will focus on the availability of commercially-made systems; consumer information; what you need to know in choosing a system (site selection, local wind speeds, choosing a machine to fit individual requirements); farm applications and a panel of home-owners who have had first-hand experience in using wind-powered electricity.

The exhibit area will include displays and information from manufacturers, agencies and organizations who are associated with the subject of wind power.

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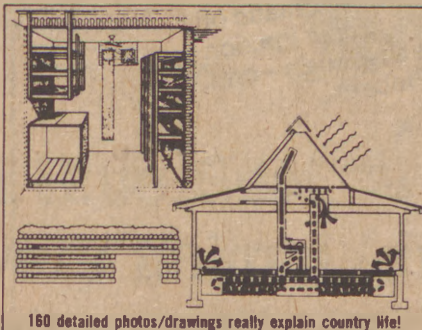


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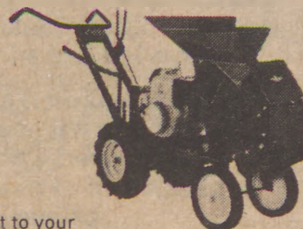


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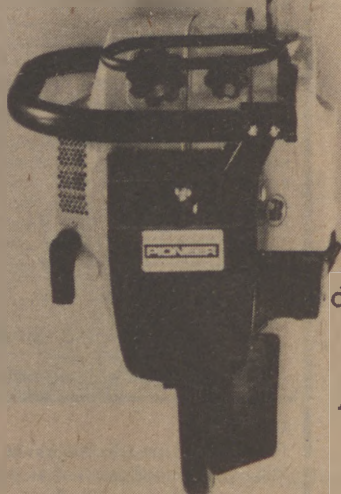
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new earth exposition

New Englanders wondering what's in store in the 1980's will get some answers at the third annual New Earth Exposition, April 18, 19 and 20 at the Commonwealth Armory in Boston. The Exposition is a unique collection of products and ideas for self-sufficient, energy-conscious living.

More than 50,000 visitors to recent New Earth Expositions have seen the latest woodburning stoves, solar technology, power-generating windmills, and multi-fuel furnaces. They have discovered numerous ways to grow and prepare organic foods by using passive solar greenhouses and practical farm and garden equipment.

The visitor should come away with useful and affordable ideas to improve every aspect of life—from energy to nutrition, preventive medicine, and creative leisure-time activities.

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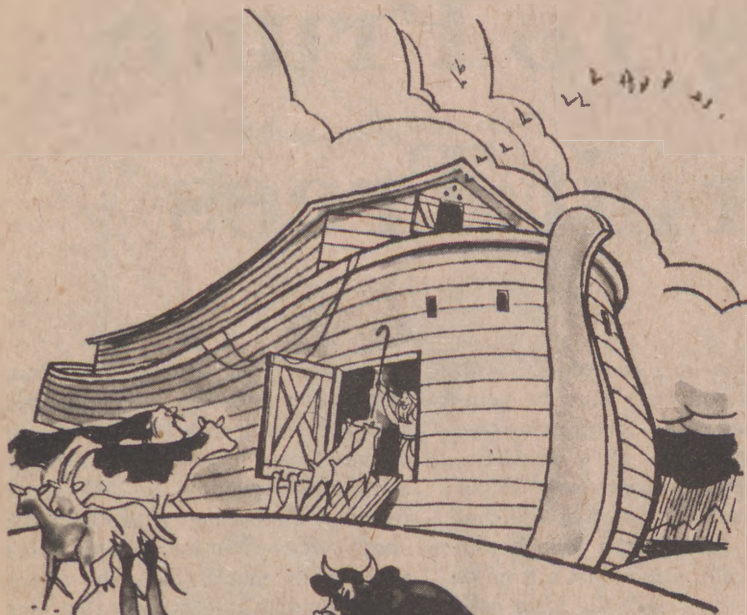
detoxifying PCB's

Louis Pytlewski, a chemist of Drexel University, has developed what may be the first chemical breakdown or detoxification of polychlorinated biphenyls (PCB's). PCB's are insoluble in water, thermally stable up to 862 degrees Centigrade and resist biological and chemical breakdown. As a result, the 750 million pounds of the chemical produced between 1930 and 1971 are presumed to be still in the environment. They accumulate in body fat and are implicated in many environmental and health problems, including the reduced sperm count in American males. A method to detoxify the chemical and make it water soluble could lead to a way to flush it from the body.

Pytlewski used polyethylene glycol 400 to transfer the chemical reactivity of metallic sodium to PCB's. This pulled out the tightly bound chlorine in the PCB's and replaced it with hydroxyl groups. The sodium and chlorine bound to form common table salt and the PCB became relatively harmless and water soluble.

PCB's were banned from production and for most uses by the EPA last spring, but now we need a good way to get rid of the 40 years worth of production and accumulation.

--Science News



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It's Time To Prune Your Fruit Trees

by Margret S. Wilcox

It's easiest to learn about pruning from someone who already knows what he's doing. I learned from my father, and he learned from my grandfather, and he learned from a gardener employed by the owner of a large German castle. But you can learn too, even if you don't have a teacher. You may wish to do some experimentation on plants or trees which are of less value to you than your most prized possession. For example, a friend of mine understandably was nervous about pruning a potted grapefruit tree which had been in her family for several generations. Furthermore, your initial attempts might well be limited to only a few cuts, until you have observed how the plant responds to your pruning.

Why Prune?

One of the first questions you may ask about pruning might be, is it really necessary to prune plants? The answer "no" may surprise you, but most plants, whether house plants or trees, will grow without pruning. Trees, for example, often prune themselves. This is particularly true of trees growing in a wooded area. As you walk through such an area, you will notice that many, if not most of the lower branches of the trees, are dead or nearly so. These branches die because the upper limbs of any tree and also neighboring trees, prevent light from reaching the lower leaves. Eventually the limbs die, and in time, so do the lower branches. As branches are gradually broken off by wind and other weather, the bark of the trees grows up around the stubs, and

if the tree lives long enough, the stub of the dead branches may be completely hidden within the growing tree trunk in the form of a knothole. Similarly, if you observe your larger house plants, you will often see that the bottom leaves turn yellow and drop off. Again, this is just a form of pruning, as the leaves die from both old age and lack of light.

Why should you then interfere with a process which will occur naturally anyway? In many cases you should not. However, certain plants will actually fare better if you do a certain amount of pruning which stimulates new growth. Fruit producing plants almost always produce larger crops if some pruning is done. The wild blueberry growers of Maine know this and every second year they burn off the tops of their blueberry fields, which in fact prunes the plants, among other benefits. In other cases, you can prune simply to improve the appearance of a plant or tree, or to remove diseased tissue.

Botanical Aspects of Pruning

In order to learn how and where to prune, we must first learn something about the way in which plants grow. For the moment, let us omit evergreen trees and consider only the flowering plants which represent the majority of plants which you are growing--those which you have as house plants as well as those which you have in your garden or yard.

As you may have observed, all plants grow in length from a region located at the tip of the individual stems and branches. New cells are formed by cell division in this tip region, and as the new cells enlarge, particularly by elongation, the individual stem becomes longer. Thus the bottom portion of a stem (that nearest the ground or pot), is the oldest, while the area farthest from the ground, is the youngest.

Consider for example, a small cutting of a geranium which you may have received from a friend. Let's say it rooted, and it now sits in a pot on some sunny window sill. When you received the cutting, it probably was about three or four inches long. If that was several months ago, the cutting now should be at least twice that long. You will note that although the stem has increased in length, due to growth in length of new cells at the tip, the stem will have no side branches, only more main stem and leaves. (You may be fooled into thinking that the leaves are attached on side branches. Actually these branch-like structures are in fact the petioles of the leaves which come off with the blade of the leaf as one unit.) If you do no pruning, this main stem will continue to increase in length almost indefinitely, until you decide it is simply too ugly to warrant continued window sill space. If you pinch out the growing tip of this geranium cutting, then side branches will grow. Why?

In the angle between the petiole of each leaf and the main stem, there are small growing areas or buds which have the capacity to develop into branches growing out of the sides of the main stem. This pattern, of latent buds directly above each leaf petiole, is present in the majority of plants. The growing tip of each main stem produces a chemical which is transported throughout the stem and which has the effect of preventing these lateral buds from developing into branches. Thus, when you pinch out the growing tip, you stop the formation of this growth-inhibiting chemical, and the side branches are free to grow. If you have already done this to your geranium plant, perhaps you will note that only a few branches will actually grow. This is because, as the first side branch grows, its growing tip begins to produce the growth-inhibiting chemical, and other branches are again prevented from growing.

Margaret S. Wilcox prunes her fruit trees in Thorndike, Maine. Ink drawings by Lynn Ann Ascrizzi.



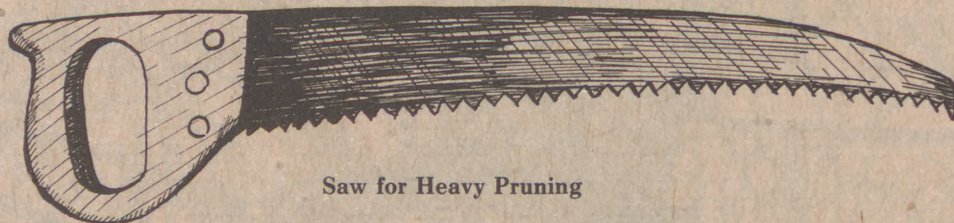
Some Environmental Aspects

Since plants make their own food, and since sunlight is a necessary ingredient for manufacturing that food, portions of plants which receive the most light will make more food and will generally grow the most. Thus, you will find that those tree branches which are not shaded by other branches, will grow faster than those which are shaded. If the tree is a fruit tree, a shaded branch will produce less fruit than a non-shaded branch. In the geranium, those leaves which are nearest the window will probably be larger than those away from the window. Of course, this is only true if you never turn the plant

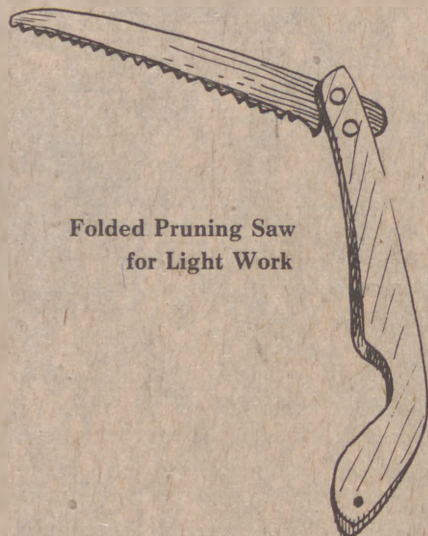
around, and as you know, if you were to grow the plant without turning, it will eventually lean toward the light. This turning toward the light is a bit more complicated than the simple explanation given above, and since this really has little bearing upon pruning, we will suffice it to say that this leaning is caused by chemicals produced within the plant, and really not caused by food supply. Whether you are dealing with a house plant or a fruit tree or flowering shrub, you should consider the availability of sunlight to the various parts of the plant when you make decisions regarding pruning.

Something to consider when pruning is seasonal variation in

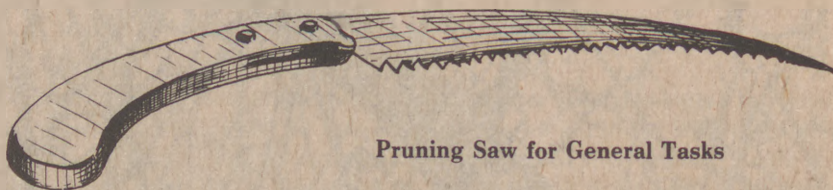
growth. If the primary objective of your pruning is to stimulate growth, then you should do the pruning as early in the growing season as possible. Above all, you should not prune and stimulate growth just before the winter season begins, for the new growth will be particularly vulnerable to winter kill. Obviously, if you live in a more tropical climate, the growth of plants may be steady throughout the year if the climate is more or less constant, or growth may be restricted to wet seasons in areas where the changes in climate consist of alternating wet and dry seasons. In such a case one would obviously prune near the beginning of the wet season.



Saw for Heavy Pruning



Folded Pruning Saw
for Light Work



Pruning Saw for General Tasks

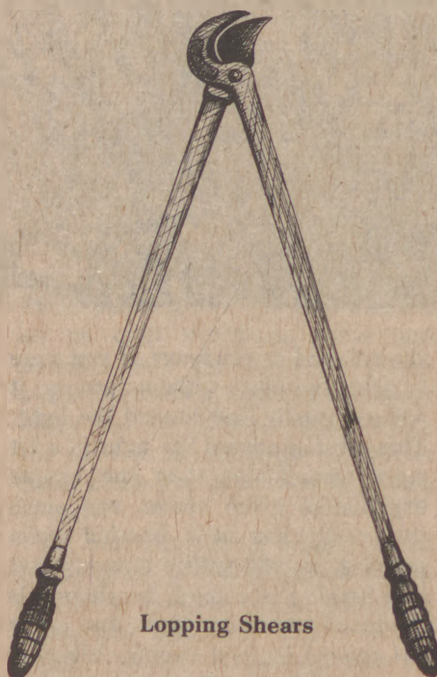


Short-Handled
Pruning Shears

Tools of the Trade

Those of you who have been pinching back house plants regularly, know that your fingers and finger nails are very efficient for many pruning tasks. While your fingers are great for getting out terminal buds in soft tissue, you'll need some kind of blade to remove any woody tissue. A pruning knife is handy for small pruning jobs. With it you can cut off small twigs, remove small diseased portions with the point, scrape off pieces of bark and remove unwanted root suckers. As with all pruning tools, the knife, which looks like a pocket knife, but has a longer blade with a curved tip, must be kept sharp. And as with all tools, it must be kept clean. If you cut diseased tissue, clean the knife with alcohol.

Pruning shears are for twigs and branches up to about $\frac{3}{4}$ inches in diameter. If you do a lot of pruning, you should consider spending a little extra money on good shears which will keep their sharp edge and which feel comfortable in the hand when you



Lopping Shears

work. Be sure that you can easily lock and unlock them.

If you can also afford lopping shears, you will find that they can cut many sizes of branches that are too

large for pruning shears. Most of these larger branches can also be cut easily with a pruning saw, but if the branch is small enough to fit into the lopping shears, you will find them to be much quicker and easier to use than the saw. The lopping shears are just like the pruning shears except they have long handles and the blades are a bit larger.

Those branches which do not fit into the blades of the lopping shears require a saw. There are several styles of saws designed for pruning. All have the teeth set farther apart than other hand saws. My favorite is a curved saw with a curved handle. There are several sizes of this type of saw. The size of the branches you need to cut will determine what size saw you need. Sometimes you may be tempted to use a power saw such as a chain saw for pruning tasks. Such saws really are not well suited for pruning, because you cannot make accurate cuts and you run the risk of cutting more than you intend. Such a saw is dangerous to use too, because the angles at which you need to cut are often awkward for power saws.

Pruning Apple Trees

One of the most important pruning jobs for farmsteaders is the annual job of pruning fruit trees and bushes. Let's first consider old apple trees which are so common on land purchased by new farmsteaders. In New England where so many farms have been abandoned, old apple trees are found every where. What can be done to revive these trees? First of all, realize that many cannot be revived. As you probably know, all apple trees, except those which have grown up wild from seed, are the result of the graft union of two varieties, the upper fruiting portion, the scion, and the lower, rooting portion, the stock. The reason for this is that varieties which grow good apples do not have good root systems, and vice versa. What has happened to many of the old apples in New England is that the original scion died for one reason or another, and then new shoots grew from the old root stock. The apples growing on such trees taste terrible. They're not even good for cider. The only thing these trees do is to serve as a breeding ground for the insects and various disease organisms which then can damage the good apple trees you may have.

This does not necessarily mean that you should just cut down all the old apple trees on your property. It does mean that you need to let each tree bear fruit, then taste the fruit to see if it's palatable. Sometimes you may find some really marvelous apples coming from these old trees. Some of the wild ones growing from seeds may be new varieties never seen before. Some may be old apples planted several generations ago, varieties of the "antique" type uncommon today, but often very tasty. It is these good trees that you should prune in order to bring them into good production and in order to help control diseases. The bad tasting ones should be removed. They make good fire wood.

When to Prune

The best time to prune mature fruit trees is during March and April. Generally speaking, pruning is a winter or early spring project. At this time the tree is dormant and leafless and the framework of the tree is most apparent.



A young apple tree adequately maintained.

Two Pruning Systems

Pruning is something that cannot be standardized, for each tree is an individual and needs your good judgment. Pruning is actually an art, and the pruner must work with care, look for balance and help shape and train the tree.

As A.J. Downing in *Fruits and Fruit Trees of America* stated about one-hundred years ago:

"Every fruit tree, grown in the open orchard or garden, as a common standard, should be allowed to take its natural form, the whole efforts of the pruner going no further than to take out all weak and crowded branches."

It is generally true that as a tree grows older, the need for pruning increases, but it is usually better to prune lightly to moderately since excessive pruning can inhibit production.

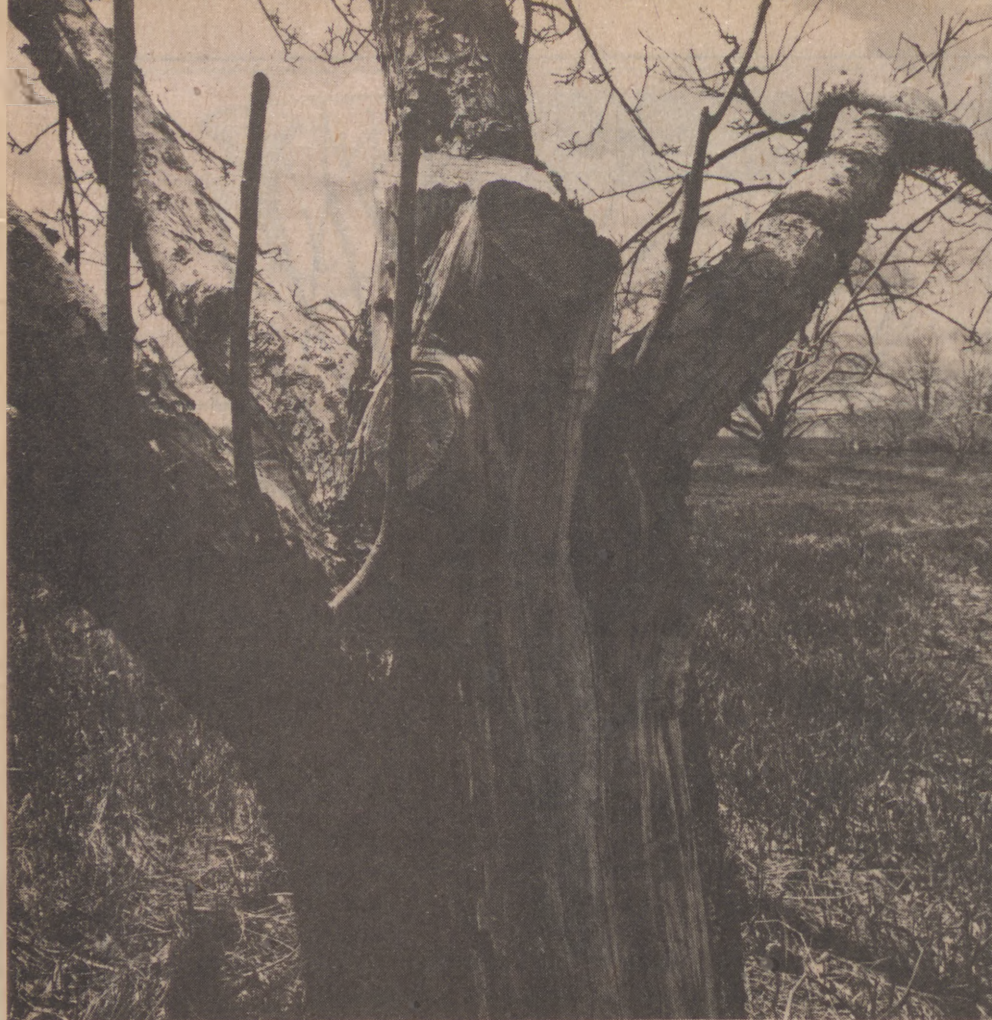
Before pruning, make sure your shears, knife and saws are sharp. This prevents unnecessary injury to the tree and encourages natural and fast healing of wounds.

The orchardists of America have for the most part, adopted the "modified leader system" of fruit tree training. By "leader" is meant the growths which determine the height and general shape of the tree. The "modified leader system" means that four main branches from the trunk are trained, and distributed vertically and spirally about the main trunk. This helps reduce the risk of forming weaknesses in the crotches and prevents V-crotching and crowding.

Apples and other fruit trees are sometimes pruned to form "open-center" trees, creating a vase-shape specimen that branches low and has no central leader.

To develop this shape, a year old specimen is cut back to a height of about three feet. A limited number of side shoots are selected to form scaffold branches. All others are pruned out, and the development of any new central leader is prevented by cutting out any shoots which arise that might develop into one.

The modified leader system, however, is best adapted for Northern conditions and the constant stress of freezes, thaws and heavy snow.



Water Sprouts and Crossed Branches

To some extent, the amount of pruning that you elect to do depends upon the size of the tree. We have a good crab apple tree which is taller than our house. My intention in pruning it is only to remove dead branches. This also means that I do not want to spray the tree, and therefore, I do everything possible to keep the ground clean. In fact, the first thing you'll want to do with any apple tree is to cut out the dead and diseased branches. In the old abandoned trees you will no doubt find many dead branches.

You may also find a lot of water sprouts (vigorous, non-fruiting branches growing straight up). Sometimes the water sprout can be quite large. You should cut out these water sprouts and have a better shaped and more productive tree. Sometimes if you cut out all the water sprouts, you'll have no tree left. You don't want to do this, however, if the apple is good tasting. You should then cut out only some of the water sprouts, and this will help improve the tree.

The next type of limb that may need removal is one which crosses over another branch, shading it from the

sun or causing the bark of the two to be worn off. Such crossed branches need special attention, for you want to be sure to cut out the proper branch. You need to look carefully from a distance before you cut, to make sure that you are leaving the best branch in the best location and also in the best condition to produce fruit. You can tell which branches are likely to produce fruit by looking for the short fruiting spurs located along the branch.

Don't try to do all the major surgery in one year; rather, take a few branches each year for three or four years. As you cut branches, be sure not to cut just anywhere, and leave behind an ugly stub. When such stubs die, they prevent healing and encourage decay.

Cutting A Large Limb

The best method to cut a sizeable branch is to make the cut just above another side branch; then the scar will soon be hidden by new growth. Do such pruning early in the growing season, and slowly. Stand back and look frequently at your progress. Then you will be less tempted to overdo.

If the branch is heavy you'll need to remove it in two steps. First, remove

the outer portion of the limb. If a branch is more than two inches in diameter, it will easily rip bark from beneath the cut as it falls. Such a rip can greatly increase the size of the wound. To avoid this problem, first make an undercut on the underside of the branch.

The cut needs only to be an inch or so on this side. Then you can finish cutting this outer portion of the branch by cutting from the top of the branch down.

A portion of the branch will then remain as a stub. When you remove this stub, you will want to saw as close to the trunk as possible, making a clean cut. Again, begin by making a cut from the bottom. When you make the cut from above, try to guide the saw in such a way that the two ends will meet.

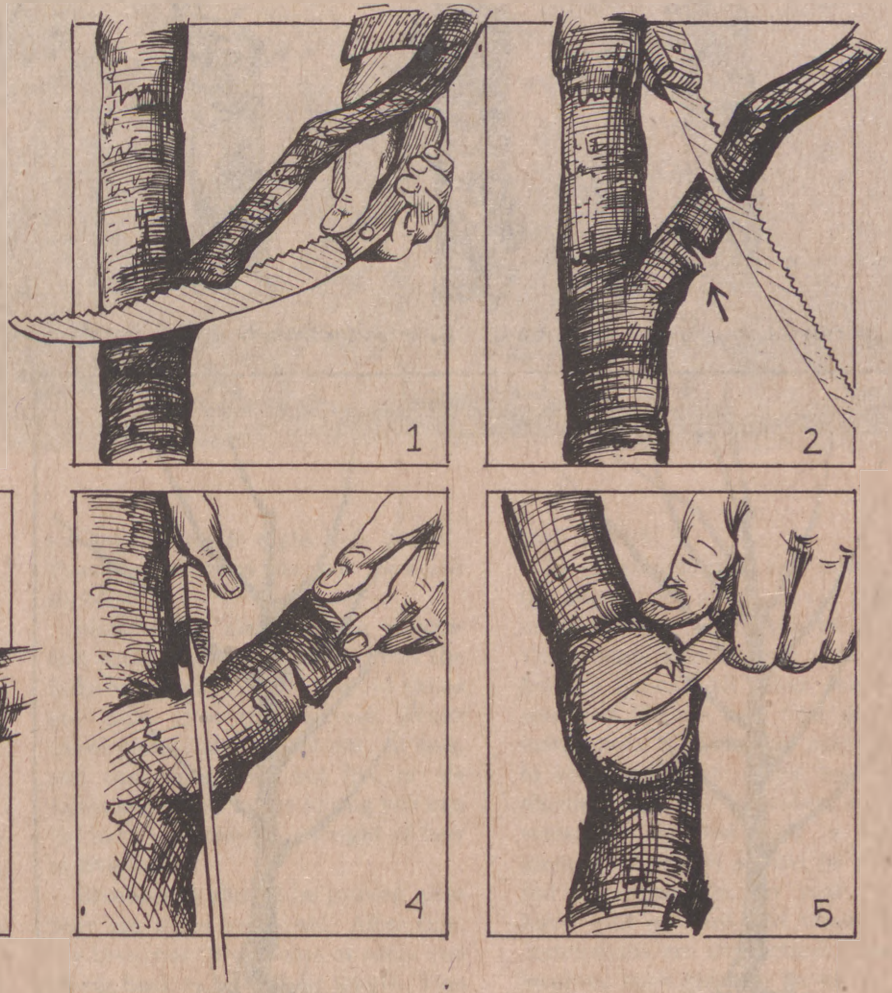
Sometimes you need to clean up any frayed ends on the cut with a pruning or a pocket knife. Make such a cut as clean and as close to the trunk as you can so the bark growing around the wound will have a good chance of covering the open tissue before disease organisms can get a foothold. Close cuts also decrease the size of the knot which will form in this region.

Special tree wound paints are procurable from dealers in horticultural supplies. Some people have used paint or asphalt. Others claim that if the cut was made properly without a spur, it will heal quickly by itself, without any special treatment. Small cuts tend to heal rapidly. In tests made by the Department of Agriculture, one of the best wound dressings tried was common shellac.

After you have removed dead branches, water sprouts and crossed branches, then you can remove some of the other problem branches such as one of two branches which are rubbing or which are growing in the same direction with only a few inches between them. You can also remove those which grow toward the center of the tree. It is important to keep the center of the trees open, just as in roses, in order to control growth of disease-causing fungus organisms by improving the air circulation. Branches which grow downward are usually non-productive and should be removed. In all cases, when in doubt, do not cut the branch off. You must not remove too many fruit bearing limbs as this will decrease, rather than increase, production.

CUTTING A HEAVY LIMB

1. First make an undercut about a third of the diameter of the limb.
2. Saw completely through the branch with an overcut.
3. The falling branch will not tear off bark beyond the undercut.
4. Remove the stub by sawing it off close to the trunk.
5. Trim the edges around the cut to give a smooth surface.

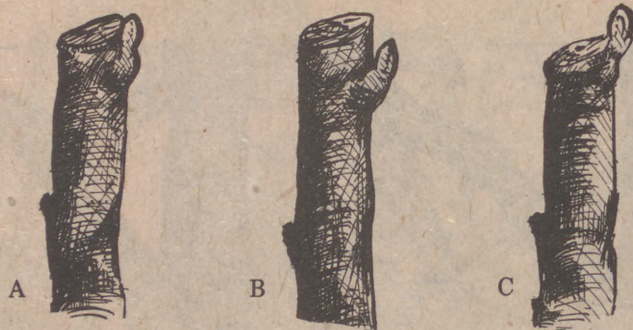


Branches which grow out wide-angled from the main stem at about 60--90 degrees are the strongest. A tree should have three to five of these wide-angled branches, and no more. But often in these old trees you have to work with what is there, and you can't have perfectly shaped trees as you could if you planted and tended them yourself. Several of the good apple trees with which I have been working in the last few years have some really serious major branch problems. I probably should just not bother, but they produce really extra delicious apples and I would like to salvage them if I can. In some cases, this means making artificial support systems for some of the weak branches until the tree grows some stronger branches to replace the weak ones. A commercial grower would not bother with such extra work. I hope it pays off for me.

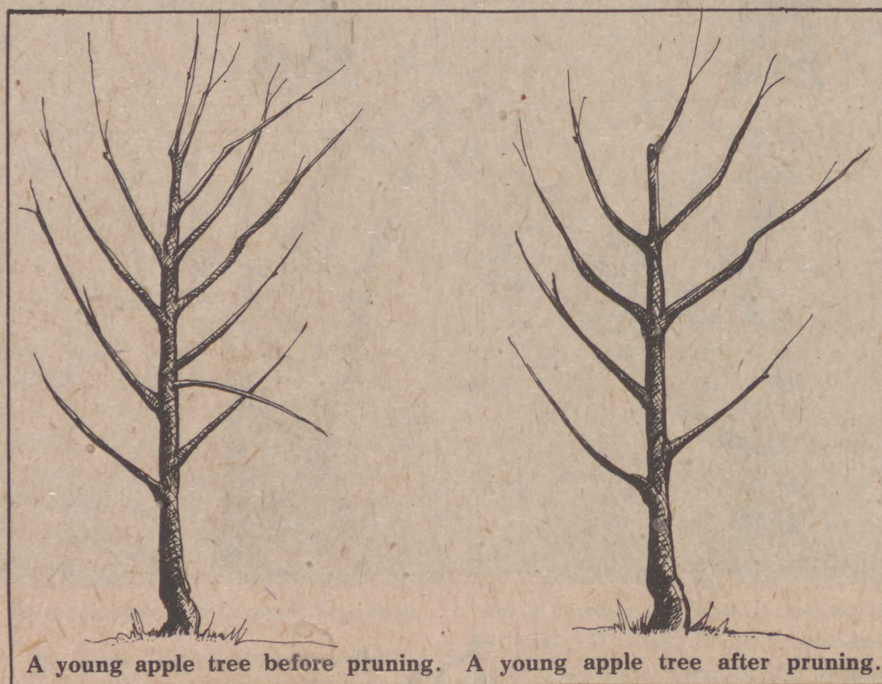
One of the effects of pruning is to stimulate new growth. This may not always be a desired effect in old apple trees. The new growth may be new water sprouts which you have to remove. This is easy to do, even with your fingers, if you do it when they first come out and before they become woody.



Remove young water sprouts.



A, is correct way to cut above bud; B, is too far from bud; C is too close.



A young apple tree before pruning. A young apple tree after pruning.

Pruning Young Trees

So far the discussion has been restricted to old trees which are usually large, of the so-called standard size. If you plant new trees, your pruning job is much different. In the first place, most experts recommend either dwarf or semi-dwarf fruit trees for the home grower. Since the growth of these types is naturally restricted, you may have little pruning to do other than occasionally removing weak or misplaced branches. To some extent this depends upon where you buy your trees. Some of the nursery growers do the initial pruning before they sell the trees. In this case you need to just plant them. Other growers do not do this.

In this case, you need to select three to five best branches, particularly those growing at a 60--90 degree angle and growing from different sides of the main leader or stem. All the other branches are removed, leaving only the selected scaffold branches to grow. Most good nurser-

ies send or give planting and pruning instructions with their trees. Since they differ in what they do before selling the trees, I believe it is important to follow the directions which come with your trees.

Whatever you do, be aware that you must err on the side of cutting too little rather than too much. Sometimes too much pruning actually delays blooming and fruit set. Try to secure well-grown, nicely branched trees. Set them out in early spring. Remove only superfluous limbs and twigs. A one-year old tree, at planting, is usually headed (cut back) to approximately 36 inches high after planting.

With a two-year old tree growing five to six feet high, you should head it back 40 to 48 inches from the ground and remove all but three or four well-placed laterals (side branches) that grow at least 20 to 25 inches high, and eight to ten inches apart on the trunk. These will form your basic scaffold branches, and they should point in a different direction to give balance and good tree conformity. Do



A fruit bud is usually thicker and rounder than a leaf bud.

this is the early spring before growth. No summer pruning is necessary. In the third or fourth springs, you need only to thin out weak wood, water sprouts and suckers.

For the first few years, you'll want to keep the main leader larger in diameter than the scaffold limbs. By doing this, you'll encourage strong crotches and discourage the scaffolds from becoming the leader. Another good idea is to occasionally snip back the tip of the scaffold branches a foot or more to keep their height below the leader. After a harvest or two, the limbs tend to bend enough by themselves, so you can do away with this operation.

Again, be careful that permanent scaffold limbs are not crowded. At their base they should be ten to twelve inches apart, because you must expect each scaffold to develop side branches. Although there are usually four permanent scaffold limbs growing from a central trunk, there may be as many as eight depending upon the height and strength of the tree's main leader.



Other Fruits

The pear, cherry and plum trees grow in a manner similar to apples. At planting time, prune as directed by your nursery grower. After the initial pruning they really require little thinning, other than removal of dead, diseased or badly placed branches. Pears should be pruned after the severe winter weather has past. Peach, nectarine and apricot trees have a somewhat different growth habit from apples. The branches are more spreading, and some central branches may be removed to allow sunlight to reach all fruit. Again, any pruning should be done after freezing temperatures have past, but before new growth begins. You may hand pinch two inches off the soft, leafy shoots in June.

The small fruits all require special pruning techniques depending upon the variety. Again, I would recommend you follow the directions supplied by growers.

Raspberries grow suckers or shoots one year which flower and fruit the following year. Red raspberry canes, not of the everbearing type, should be cut to a height of 30" before growth starts in spring. Limit the number of canes by removing all weak canes and all canes between rows. The everbearing types can be cut to the 30" height as above, in which case, you get a more or less everbearing crop. If you cut them back to a four inch height while still dormant, then you get a heavier fall crop. But you cannot use the latter method on the Latham and Taylor varieties. Remember, black and purple raspberries need to be "topped" in early July. This means that you pinch off the ends of the canes to make side branches grow. That is the first year. The following spring, these side branches

are cut to a six to eight inch length. These raspberries do not produce suckers.

Blackberries also produce vegetative suckers one year which fruit the following year. Cut out the old canes any time after the harvest. Weak canes should also be cut out. In fact, you can remove all but five or six canes per plant. In the spring you can cut back the canes to a height of four to five feet.

Blueberries should be pruned after they are three years old. After this, the branches three years or older can be cut back $\frac{1}{4}$ to $\frac{1}{3}$ their length. This promotes new growth which will bear fruit the following year.

Grapes probably need the most sophisticated pruning of any fruit. The method of pruning varies with the way in which you elect to grow the vines. To some extent this depends upon what varieties you grow. For example, the European varieties are usually staked and the American varieties are usually grown on a trellis, while the muscadine vines are grown on arbors. In any case, pruning must be done annually before April first, either in late winter or early spring. The best fruit grows nearest the base of the vines, so if you do no pruning, the fruit becomes inferior. As with other purchased plants, the best plan is to follow the directions the growers provide. The grape will fruit on canes formed the previous year. The trick with the pruning is to leave only enough buds to supply the fruit and the new canes for next year's buds. Usually, this means that you allow four fruiting canes per plant. Each cane should have six to ten buds. These canes are tied to wires. Each spring you remove the canes which have borne fruit and tie up four new canes to bear another

crop of fruit.

In addition to this, two canes near the base of the plant are cut short to make spurs with only two buds each. These buds develop into next year's fruiting canes. All other canes are removed. Please note that growers' instructions differ in how many canes to leave and how many buds each should have. The important thing to remember is that only a limited amount of growth should be permitted to continue in any year. If you have wild or semi-wild vines, these instructions are impractical. You can improve such vines to an extent just by cutting out old wood and cutting back the general size of what may be just tangled web, as long as you leave some of the previous year's growth to bear fruit.

Clean Up

Last but not least, what do you do with the remains? The worst thing you can do is to leave them on the ground around pruned plants. This makes an untidy mess, and more importantly, the material which you cut off dies and then serves as a prime breeding ground for disease-causing organisms and insects. So what to do with the scraps? Unless you have a shredder, woody tissue is difficult to compost, so you may need to use more imagination to find a good use for this material. You could put the scraps in areas where erosion is a problem. You could dry them and cut them up for kindling.

I find I can get rid of a lot of debris to cover up an old trash dump area. Eventually, the organic matter will decay, and I hope support vegetation all over the dump. You can use twigs to roast wieners, and larger sticks are good to throw for your dog to chase. As a last resort, you can take them to the town dump. □

Start Your Own Backyard Orchard

by John W. Van de Water

Have you ever dreamed of picking your own fruit right in your own backyard or farm orchard? Dream on, for yesterday's dreams can turn into tomorrow's fruit. All it takes is the right spot, the know-how and some energy. I was about to say "some hard work," but if you are like me, any activity involving growing things in the good earth is not so much work as one of life's greatest pleasures. Nonetheless, a farm or backyard orchard will require intelligent use of your energies.

What is the right spot? It is almost any place that has a reasonably good deep soil, is well-drained and gets plenty of sunshine. Do not despair if your soil is not Dutchess silt loam. You can improve the soil around your trees with composts, mulches, ground rock and the application of trace minerals, if soil tests show the need.

The drainage slope can go in any direction, but it must drain both water and air. Just be sure you don't waste time and money by planting your trees in a hollow. Fruit trees do not tolerate frosty pockets of air or soggy "feet." The right spot can be located in almost any section of the United States. Of course, you will have to make adjustments and grow only those trees acclimated to the area you live in. MacIntosh apples will not do well in Georgia, nor will Georgia peaches thrive in the cold winters of northern New England.

Having selected your future orchard site, you will want to order catalogs. There are many good ones available. Once they arrive and you sit down to study them, you may have taken an irreversible step.

Now a word of caution. Your orchard will be around a long time if you take good care of it. Every step you take must be right. While the reputable commercial catalogs are

good, they do not always have the best varieties available for you. Nor do they always tell you which varieties will do best in your area, which ones are, or are not, scab and blight resistant. So don't move too fast. Talk to successful orchardists and your Extension Service.

Many states have experiment stations where new varieties of fruit are constantly created and tested. So when you send for catalogs, be sure to include one from your state's experiment station. I live in New York State, and we have an excellent experiment station located at Geneva. From there you can get new scab-resistant and blight resistant varieties of dwarf, semi-dwarf or regular-sized stock.

Do you plan to make cider? I compare the free, homemade, unpasteurized nectar from my fruit to the insipid three dollars per gallon pasteurized liquid sold on the market, and quickly say—"yes" to that question. If you agree, be sure to order some of the old and tested varieties like Russet or Northern Spy.

Some of the new varieties are superior in many ways to currently well-known ones like MacIntosh or Delicious. The backyard orchardist is quite likely to be an organic grower, and in any case he will want to spray as little as possible. MacIntosh and most of its cousins, are highly susceptible to apple scab and hence must be sprayed frequently. For Macs, a fungicide application may be needed twice a week if the spring and early summer are wet. In preference to MacIntosh, the prudent gardener may consider Priscilla or Liberty. They are all-purpose fall apples designed for general quality and freedom from scab and blight. Our area in northern New York near the St. Lawrence River is on the northern edge of their viability, but so far my trees have weathered three winters of minus thirty degrees and are doing well. Winters here are comparable to those of northern New England.

When you set out your orchard, just follow carefully the excellent directions that will be supplied with your trees. If you buy from a reputable supplier, you should have one hundred percent survival. I prefer to set young trees in the spring, but some people get by with fall planting. As soon as you set out your trees, protect them from rodents and winter injury by wrapping the trunks. There is commercial wrapping paper available, or you can wrap a

Better Apple Trees

by Lucretia Douglas

On the land where my husband and I lived when we were first married, were six Baldwin apple trees that were almost ten years old and had never borne an apple. That fall I tried something I heard about--sprinkling a pound of borax under each tree. I learned that fruit trees have to have a trace of boron in the soil to bear. It must have worked, for all the trees were loaded with apples the next year. Borax also helps beets and plants of the cabbage family. Apply a light sprinkling along with the lime and fertilizer.

If you have more than one plum tree or apricot or even a peach or a pear tree, and never had them bear, it may be they need a pollenizer as well as boron in the soil. There are varieties in

each category that have to have another kind planted beside them in order to bear. Sweet cherries are never self-fruitful. Two kinds must be planted.

You can find out what kinds go together by consulting a good nursery catalog. They have to be in bloom before they will help, so if you have a mature tree of one kind and you set out the needed kind this year, you still may have to wait a year or two for the new tree to bloom before you get results.

Try and set out your new trees early. More young trees die from being set out too late than anything else I know. Just as soon as the ground can be spaded seems to be the best time. It gives the roots time to take hold before the spring rains cease. Around here, that's the last of April.

layer of foil, cover that with a layer of cardboard, and tie it all securely with string. If you tie with wire and forget to loosen it, as the tree grows, it will damage the tree.

My own little orchard has somehow grown to forty fruit and nut trees. I must call a halt to more planting, or I will soon be swamped with apples, pears, plums and cherries. Come to think of it, that's not too sad a prospect.

Some of the trees are from my own grafts. I locate a healthy volunteer seedling that the deer, rabbits and mice have overlooked, dig it up in the spring about the last week of April, plant it in the orchard and graft it to the desired variety.

I get North country acclimated scions from the Geneva Experiment Station or from my friend, Bill McKentley. Bill is now operating the late Fred Ashworth nursery in Potsdam, New York. Fred Ashworth was known as the Burbank of the North for his experiments with cold-resistant and disease-tolerant varieties of fruits and nuts.

My most successful grafts have been with the Ashworth method. Match a scion to the size of the stem to be grafted. Taking a very sharp pocket knife, make matching diagonal cuts on both so that the cambium layers can be placed in perfect contact. Wrap them tightly with a degradable tape and tie them with rubber bands. This method takes only a couple of minutes per graft and seems to be about 70% successful. No grafting wax is needed. The price is right too, and so far, my volunteer local root stock is producing healthy trees.

Should you start with regular, semi-dwarf, or dwarf varieties? There are arguments for all three, and your situation will help you decide. I have hedged and planted some of each. But for the average family orchardist, the smaller trees seem to make the most sense. They come into bearing more quickly, are easier to prune and pick, and can be planted closer together. If you find you must spray, they are easier to reach.

The area between my trees is covered with alfalfa. It is a valuable crop in itself, brings up trace minerals, adds nitrogen and keeps the weeds out. If you have more than you want, it makes the best possible mulch for your trees. In some areas, however, alfalfa is a host for fruit pests, so you should check with your



agricultural agent before planting it.

The countryside is full of farms with abandoned old orchards. There are many reasons why this is so. But it does not mean you should not consider starting a young orchard. Modern dwarf varieties can start

producing fruit in three years with little use of chemicals. Soaring transportation, energy and pesticide costs may soon result in exorbitant prices per bushel of fruit! So might not this be a good time to start raising your own? I think it is. □

Dormant Insect Control

by Steve Page

During late spring pruning, you can often spot many insect eggs. Learn to identify the good ones and the bad. On the terminals and the water-spouts, you will often find hundreds of aphid eggs--tiny black specks randomly spread around the shoot. Forewarned is forearmed. If there are a lot of these eggs, prepare to control aphids in the summer, ideally at petal fall.

Tent caterpillars leave a tight cluster of brown eggs about the size of a nickle wrapped around the branch. The whole egg mass can be removed in one piece. My pockets are sometimes full of these when I come in from pruning--and my trees are empty of the caterpillars in June.

Scrape the scaly bark off old trees in the dormant season to see if there are many codling moth cocoons. Numerous wood-

pecker holes are also indicative of present or previous codling moth larvae.

Mite eggs appear as tiny, powdery red eggs on terminals and new growth. Much of these will warn you to use an oil spray in the delayed-dormant spray. Look especially around scars on the branches, and on the undersides of twigs which are not exposed to direct sunlight.

Scale covers noticed now are dead, but under each one are eggs ready to hatch soon after petal fall. Removing them now will prevent 40-70 new ones from hatching.

Other insects, such as apple maggot and plum curculio, overwinter outside of the orchard or underground, so spotting them in the dormant season is impossible. For the ones mentioned above, however, it's worth every minute spent looking for them while pruning.

A Beginner's Guide to Chain Saws

by Michael Harris

If I were to move to an old-fashioned farm with everything quaint and handmade like a scene from Old Sturbridge Village, and could bring just one piece of modern machinery with me," Dartmouth professor, writer, woodburner and part-time farmer Noel Perrin once observed, "I wouldn't hesitate a second. I'd bring my chain saw. It's noisy, it's dangerous, it pollutes the air--and I love it."

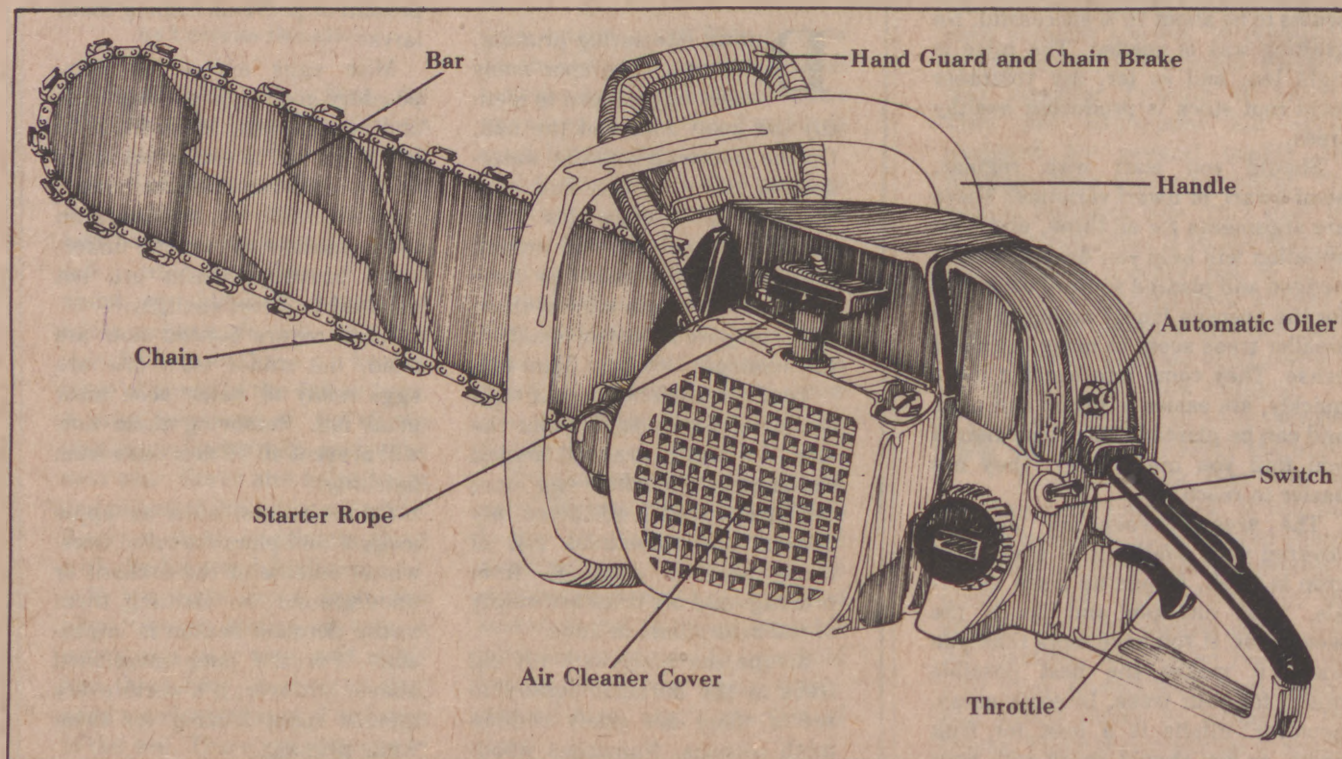
Loud, dirty and dangerous they may be, but nothing has done more to bring the age-old art of woodcutting to latter 20th century practicality than modern chain saws. Light years ahead of the earliest generations of chain saws that ripped and roared through the nation's timberlands, today's models are more subdued of voice, easier to handle and powerfully efficient.

Chain saw manufacturers offer a wide range of models and sizes. Before selecting one, it's important to know what saws are available, the jobs they are designed to do and what features will be useful for the type of cutting you plan to do. The Chain Saw Buyer's Guide is intended as a handy introduction, a representative sampling of the choices available in the chain saw market. After considering the chart, visit local dealers, try out the demonstration models on hand and take your time selecting the chain saw that's right for you.

Chain saws are usually powered by gasoline engines ranging from a tiny 1.6 cubic inches to a monstrous six cubic inches in displacement. The cutting chains are mounted on bars that may be as short as 10 inches in length for occasional, light-duty cutting, or as long as 36 inches. Most

people find a 16-inch blade sufficient for cordwood cutting without being too awkward or unwieldy; the longer bars--needed for cutting only very large trees--can be dangerous in inexperienced hands.

Modern chain saws also come equipped with a wide range of options, ranging from handy automatic oilers with manual oiling overrides and safety chain brakes, to luxuries such as heated handles, electric starters and automatic chain sharpening systems. While many of these extras may seem inviting, they can also complicate operation and maintenance of the basic machine. Experienced woodcutters have learned that exotic frills can be more trouble than their convenience is worth, so careful, personal consideration of the options under inspection and actual cutting conditions at your dealer's woodpile, is a good idea.



If you're in a position to invest in extras, one good buy to consider is a chain saw that has a slightly larger engine than is required for the bar length you choose. Not only will the extra power provide added protection against long-term wear and occasional strain on the saw, it will allow you to step up to a longer bar and chain, if needed, or add accessories to make your saw more versatile without buying a new chain saw later.

While testing a chain saw, don't forget to examine it for quiet running, low vibration and good balance of the saw's weight in your hands. When working in the woods, there's nothing that does more to bring on early fatigue than a whining, unmanageable machine.

If you are buying a saw for nothing more than some backyard tree pruning, or perhaps to cut up a few slender logs for the fireplace, a "mini-saw" will suit your purposes well. These



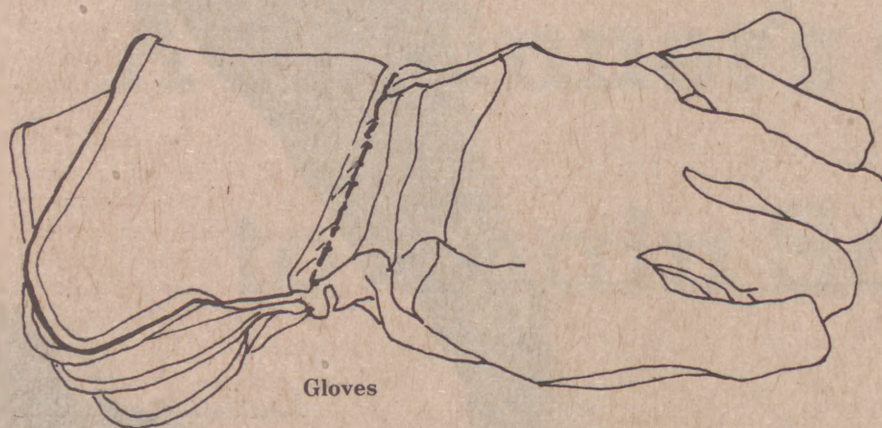
saws are usually manufactured with engines of about two cubic inches displacement, and are equipped with guide bars ranging from 10 to 12 or even 14 inches in length. Mini-saws are light, easy to handle and inexpensive. Despite their diminutive size, many brands are also rugged and reliable. Before the newfound, mass popularity of backyard chain sawing, these machines were manufactured for tree surgeons and orchardists who used them for treetop cutting. It is

easier for them to climb to lofty heights with a small-sized saw simply by hanging it from a belt and then lop off branches by holding the lighter-weight equipment in one hand.

Many makers also offer electric mini-saws, and because they are less costly to manufacture, electric chain saws may sell for only about half the cost of equivalent gas-powered models. Electric saws must be plugged into a service outlet, so their use is limited by the length of your heavy-

duty extension cord; however, if you are in the market for a handy, inexpensive tool for the sole purpose of whittling down the backyard woodpile, an electric saw might be a good investment. Not only are electric saws lighter, easier to start, cheaper and quieter than their gas-fueled counterparts, but they produce no exhaust fumes. Therefore, they can be used for woodcutting and construction projects in the woodshed or basement.

If you don't need to climb trees with your saw (a dangerous practice in the best of circumstances), and you'll be doing more than occasional cutting, a lightweight production chain saw might be the one for you. These saws are usually powered by engines in the 2.5 to 3 cubic inch displacement range and are commonly outfitted with bars 14 to 16 inches in length. They hold more fuel than a mini-saw and therefore run longer without refueling. They are also quicker to start and easier to maneuver than the heavier production models.



Gloves

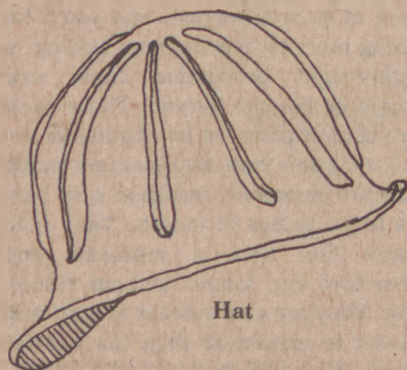
Heavy-duty chain saws, the smallest of which have displacements of about five cubic inches and bars ranging from 16 to 36 inches in length, are not for everyone. They are bigger, heavier, stronger and louder than other production saws. Unless you plan to do contract logging in the White Mountain National Forest, convert your saw to an Alaskan sawmill for the production of lots of rough lumber or cut giant trees every day, these formidable machines with their giant attachments may be more than you would care to handle.

Chain saws with displacements ranging from 3 to 3.9 cubic inches are called medium-duty saws. These machines are best suited for regular logging and pulpwood cutting, and they will usually accept a wide range of brush-cutting, hedge-trimming, stonecutting and drilling attachments. Saws from this category



Ear Guards

are best suited to the year 'round cutting done by professional wood suppliers, since they provide more power than is often required for cutting a single home's wood supply. These chain saws will certainly do the job around the homestead, but their size, weight and power may take a little getting used to.

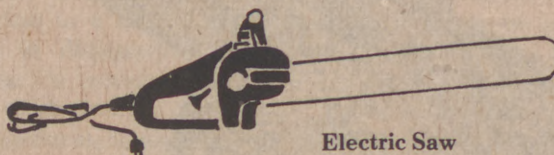


Hat

Sizes of Chain Saws —



"Mini" Saw



Electric Saw



Lightweight Saw



Medium-duty Saw



Heavy-duty Saw



Boots

If you're ready to buy a chain saw this year, first examine the following list of models, specifications and features to determine which machines might be right for you. Then, by all means, try before you buy. Ask questions. Talk with other woodcutters you know besides the salesperson at your local chain saw dealer's showroom. When all else is carefully considered, make your final choice the saw that feels the best as you work with it. After all, you'll be cutting with that saw for a long time. □

Michael Harris is the author of "The Eastern Coyote" [Farmstead, Holiday 1979], writes for the New Hampshire Times and lives in Loudon Ridge, New Hampshire. Drawings by Dianne Shelble.



Goggles

Available Chain Saws —

CHAIN SAW DISTRIBUTOR

Homelite	Homelite Homelite Distribution 60 Chapin Road Pinebrook, New Jersey 07058
Husqvarna	Jesse F. White Route 16 Mendon, Massachusetts 01756
Jonsereds	Tilton Equipment Route 1 Rye, New Hampshire 03870
John Deere	John Deere Company P.O. Box 4949 Syracuse, New York 13221
Lombard	R.D. Faulkner 146 Parkway South Brewer, Maine 04412
McCulloch	McCulloch of New England Reading, Massachusetts 01867

Presented below is a representative list of chain saw manufacturers and distributor addresses. The names and location of local dealers may be obtained by contacting the distributor or by checking the Yellow Pages.

Montgomery Ward	only by catalogue
Olympic	Tilton Equipment Route 1 Rye, New Hampshire 03870
Partner	R.D. Faulkner 146 Parkway South Brewer, Maine 04412
Pioneer	Crandall Hicks Company Route 9 Southboro, Massachusetts 01772
Poulan	R.E. Jarvis Route 9 Fayville, Massachusetts 01745
Sears Craftsman	only by catalogue
Stihl	Hampton Equipment Lancaster, New Hampshire 03584



Wild Bee Hunter

by Neal Hubbard

Seventy years ago, as a school boy of fifteen, I was an ardent bee hunter. Along with two boon companions,

we tramped the fields and pastures of Northwestern Connecticut, hoping to start a beeline to a honey tree.

Before our search began, we had to obtain a small box to convert to our special type of bee box. Not any old box would do. We knew just where to obtain one, so our plans started in the fall with the opening of school. At that time, the chalk the teachers used came in a small box about four inches by four inches by six inches. It was made of a light, odorless wood, was nicely dovetailed and had a sliding wood cover. It was that cover that made it so desirable.

We three were in different grades in school, so we had three chances to get one. By being the teacher's pet (bringing her red apples), and by staying after school to wash the blackboards and dust the erasers, we made sure that the chalk would be all used up by spring. In that way, we were almost sure of at least one box when we needed it.

Once in our hands, the transformation began. The sliding cover was replaced by a piece of window glass. My father was a carpenter and owned a glass cutter, so it was up to me to purloin a pane of glass from the barn or chicken coop and cut it down to size. Once that was done, a hole about the size of a quarter was cut in the end that wouldn't interfere with the glass slide. A trap door was made from the discarded wooden cover to fit over that hole. Next on the program was to persuade one of our mothers to buy a comb of honey from the grocery store and to let us have a good healthy hunk of it. With that in the box, and a ten cent bottle of oil of anise purchased from the village drug store with the pennies we had saved, we were ready for our trip to the fields.

The season started in spring when the first of the chestnut blossoms appeared (that was before the blight had wiped them out), and continued on until the first frost. The operation was simple. Finding a bee working on a flower, we would open the trap door, and with the box in one hand and our cloth cap or a soft rag in the other, we would trap the bee by forcing it into the box, being careful not to injure the insect. The trap door was then closed and the cloth placed on top to darken the interior. After a couple of minutes, we would peek in to see if the

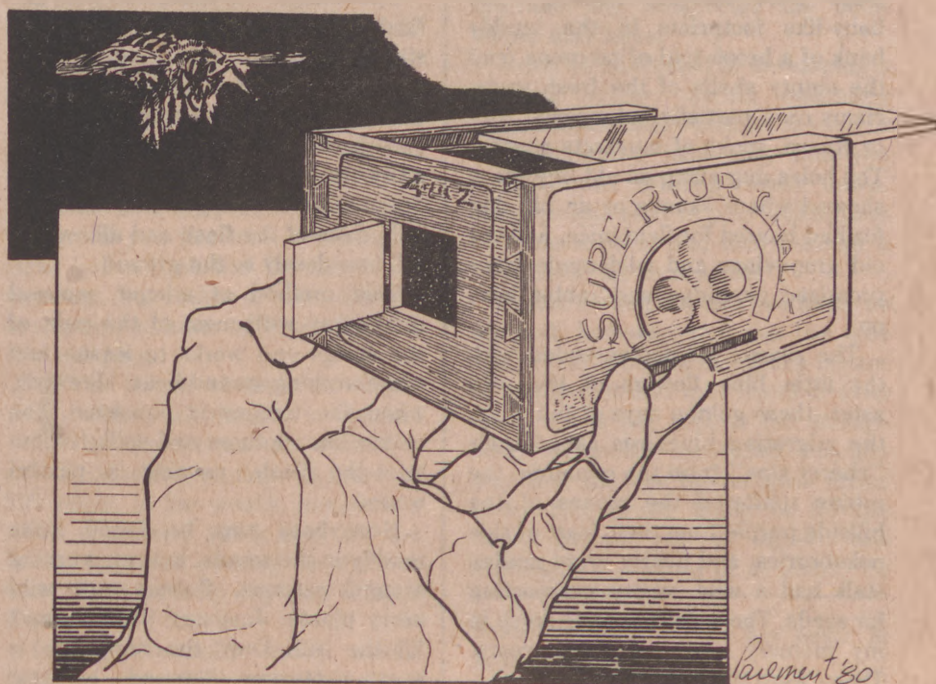
bee was down working on the honey. If it was, the glass cover was removed, some of the oil of anise was dribbled around the edge of the box and it was put on top of a boulder or fence post where we could lie on the ground to watch which way the bee flew when it left. When that happened, the bee flew straight up in the air, circled about three times and then headed for home.

The theory of the oil of anise was that the odor helped the returning bee locate the source of the nectar. Whether it actually worked, we never knew, but it was part of the ritual. When the bee returned, it was often accompanied by another, so we got an idea of the direction they were traveling, and from the elapsed time, some idea of how far away their home was. After about their third or fourth return, and as soon as they were down on the honey, we would pick up the box and work our way in that direction. As soon as we saw that they were ready to take off, we would place the box on another high spot, and in that way, gradually approach the tree. Soon we would have a steady flow, and could pick up the box and walk without fear of losing the line. Once we found the tree, we would mark it. Then, shaking what bees we could out of the box, we replaced the glass cover, and with the trap door open to let the trapped bee escape, we left the area.

It wasn't always that easy. Sometimes the original bee never returned, or we would get tired of waiting and go somewhere

else. A line could take you for a mile across country through brier patches and swamps, only to end up by someone's private bee hive. There weren't many farmers with hives, so we soon recognized when a line was headed their way. We hunted the edges of old burns and logged-off land since the old snags were good possibilities for a bee tree. Once a tree was found, it was marked and left until cold weather. With the help of older members of our families, it was cut. Sometimes it was worthwhile, and at others, a total loss. Once we worked all morning cutting down an old snag only to have it burst when it hit the ground, revealing it to be full of dying bees. The honey was black and foul-smelling, caused by foul brood disease.

Our most spectacular find came when we followed a line into an old abandoned farm house. There was a story connected with the old place. Years before, a man had lived there alone and had built his house on the edge of a small, five acre swamp pond. He lived there several years and then mysteriously disappeared. A neighboring farmer chanced to stop by and found the door open and everything in order, but no trace of the owner. At that time, the swamp had been gradually taking over the pond and there were several floating islands throughout. It was thought that the man had ventured out on one of these and had broken through and drowned. No trace of him was ever found, and time and vandals wrecked the old house. White birches and



Neal "Grandpa" Hubbard lives in Bellevue, Washington. Bee illustrations by Tom Paiement.

sumac took over the fields. A few of the old apple trees remained, but outside of an occasional partridge hunter, few people ever went near the place.

When we arrived at the house, we could see that there was an old and large bee colony, judging from the large number of bees flying in and out of a knot hole in the old clapboards. We went home and told our folks. A couple of older brothers went back, looked it over, and decided to keep a close watch until cold weather. When the old plaster and lathing was torn out, the area between the studs was solid with comb. I remember helping to carry a wash boiler and several pails full of honey about half a mile to the nearest road because the old original road into the place had been abandoned years before. You can bet that everybody had honey on their pancakes that winter! Our mothers boiled the empty comb in water, skimming off the wax. Then they made little patties of it and covered them with cloth. These were used on the "smoothing irons" the women used to iron their shirtwaists and lace collars. I remember the cloth on my mother's was blue and white polka dot. Every farmer had a cake of wax to be used in pointing the thread used on his harness repairs.

One thing about bee hunting was that you learned your area like the palm of your hand. Tramping over the countryside was a school by itself. Your countryman's eye noticed where the best berry patches were, where the huckleberries grew, where the nut trees were for fall hunting. The baby-like footprints in the muddy bank of a brook told of raccoons, and the empty shells of the fresh water clams on a partially submerged rock or stump, spoke of muskrats nearby. The holes dug along an old line fence showed where skunks or an old dog fox had hunted for field mice, and the old grapevines and wild apple trees promised partridge and rabbit later on.

The season for nectar ended with the little blue flowers of the wild aster--those golden days of fall when the migrating bluebirds called their "cherry ripe" from the orchards, the robins spattered the stones of the hillside purple from their feast of ripe pokeberries, and nearly every mullen stalk had a wild canary prospecting for seeds. Those days are still fresh in my memory after all these years. Those were the happy days. □

Build a Bee Box

by Susan C. Feldhake

When sugar prices rose several years ago, natural food lovers and penny-wise housewives searched for an alternative sweetener. They found it in honey--the valuable product of a busy hive of honeybees. But, buying honey can become expensive, and the cost out-lay needed to buy new bee equipment and stock hives can be a souring experience.

Bees can be ordered from a supplier, but how much more fun and less expensive to go bee hunting and get bees for free! Well, almost. The only thing invested will be your time and the bait it takes to attract them.

Before going bee hunting, it's a good idea to know a little bit about these insects. They are gentle critters who go about their business and do not threaten to sting unless they feel threatened. A bee almost always stings out of self-defense. Fast, swatting motions can drive bees into attacking.

When they do get stung, most people incorrectly remove the bee stinger and heap misery on themselves in the process. Bee stingers hardly ever cause serious trouble if removed correctly.

The stinger is inserted into the flesh by the bee. Attached to the stinger is a sac, which upon close inspection appears whitish-beige in color. This sac contains the bee venom. By first scraping and lifting away the sac from the skin with the fingernail, the stinger may then be pulled out of the flesh and allowed to fall harmlessly to the ground.

This method of stinger removal does away with most of the pain of the stings and works to lessen fear while working around bees. However, when the stinger is squeezed, the poison sac ruptures and spills venom into the flesh, causing a painful wound.

Honeybees may be found quite readily in the woods, in town working around gardens, flowers and wild berry plants. Just any "bee" won't fill the bill. Only the honeybee is worth capturing. Trapped hornets,

yellow jackets and bumble bees will only get you a hard time and possible stings.

Most wild flowers produce some kind of nectar that will attract honeybees. Because the flowers and weeds bloom at different times of the year, one may know almost exactly where to look for bees, by the season.

In the spring bees may be found by blooming fruit trees and houseyards and the woods. They may be located on dandelion and wild berry plants as well as on spring flowers. Summer shifts the bees to clover fields, patches of buckwheat, later blooming wild flowers and the garden variety flowers. In fall, the bees seek out goldenrod and very late blooming flowers and weeds for their nectar. By taking a moment to note what is in bloom a minimum of time will be spent locating honey bees industriously gathering nectar to take back to the hive.

Most methods of hunting any game require something with which to bag the quarry, and bee hunting is no exception. However, it costs a little to begin.

A bee box is necessary equipment and may be made quite easily even by an inexperienced woodcrafter. It need not be fancy nor even made out of high quality wood. The basic requirement is that it be approximately eight inches long and four inches wide. The bee box should have two windows at each end of the box, inlaid with clear glass, and a shutter over the window to let in light or block it out.

The box is divided in half with a partition. Approximately, the top two-thirds is stationary, and the bottom one-third a movable slide. The partition slide is the only way that bees are able to get in or out of the retaiing compartment. The other half of the box has a lid mounted on hinges, with a shuttered window that may be lifted back.

Once the bee hunter has located an unwary honeybee that is busily gathering nectar, the box(with the lid open) is drawn quickly up underneath



Parts to the Feldhake bee box: a. observation windows which open and close; b. partition slide to allow

trapping and subsequent freeing of bees; c. capturing room; d. retaining room.

the plant where the bee is working. The bee should fall into the box, then the hunter should pull back the partition-slide and open the window shutter to the retaining compartment.

True to nature, the bee will fly under the partition, attracted to the light in the belief that it is an escape route. As soon as the bee can be viewed in the retaining compartment, shut the partition slide. Then, repeat the procedure with several subsequent bees. After about a half a dozen bees have been captured, the bee hunter is ready to set about locating the bee tree.

Place the bee box on top of a fence post, boulder or other solid stationary object. Open the lidded compartment and place a piece of empty honeycomb (obtainable from a beekeeper or supply house) in the compartment. With a clean eyedropper, fill the comb with bait made from one part sugar to four parts water. If unable to locate and obtain empty honeycomb—a piece of clean sponge may be substituted—although it is not as desirable as real honeycomb.

After the comb is filled with the bait, the lid to the compartment should be closed and the top window shutter left open. Then open the partition slide so that the bees will leave the retaining room and go into the compartment with the sugar

water. They should fly straight to it, and gorge themselves.

When the bees are filled, pull back the lid to free them, and step back. The bees will usually come and go to the bait box several times, hovering while they get their bearings, then fix the location of the box. Then they will head to their hive. When the news of easy syrup spreads throughout the bee colony, the number of hives working on the bait and forming a line will slowly increase.

After the original bees have left, transfer some bait into a container that closes easily, such as a cigar box. Trap several worker bees in it and move it gradually in the direction of the departure path of the bees. While a bee box with compartments is dandy to have if you bee hunt regularly, a cigar box will suffice for the initial trapping, but makes it more difficult to trap any number of bees without a few escaping.

The length of each move you make with the box is dictated by the terrain. In a field it can be quite far—perhaps as much as 200 yards. In the woods, however, a move of several yards may be the limit to prevent passing up the bee tree. Never pass up any tree without first checking it out.

During especially heavy nectar flows in some plants the bees will

ignore the bait and not return once released. If this is the case, the hunter may as well consider the bee hunt officially over for about two weeks until the nectar flow has diminished and bees will again show interest in sugar water bait.

When trapping bees several times in the same general location, it is not unusual to capture bees working for two separate colonies. This is evident when bees gang up on each other, and the bees from the lesser represented colony are killed off by the bees in majority. Therefore, bee trees cannot be located simply by starting two groups of bees and hoping that the point of juncture in the line of bees will cross at the bee tree. This is not the case. They are often foraging for two separate colonies.

Most bees cease working in late afternoon and remain in the hive, so at that time, there are fewer bees flying around. If the bee hunt is to be continued the following day, the comb may be refilled and left in place with the cigar box being weighted with a rock or heavy object. This saves a lot of backtracking the next day.

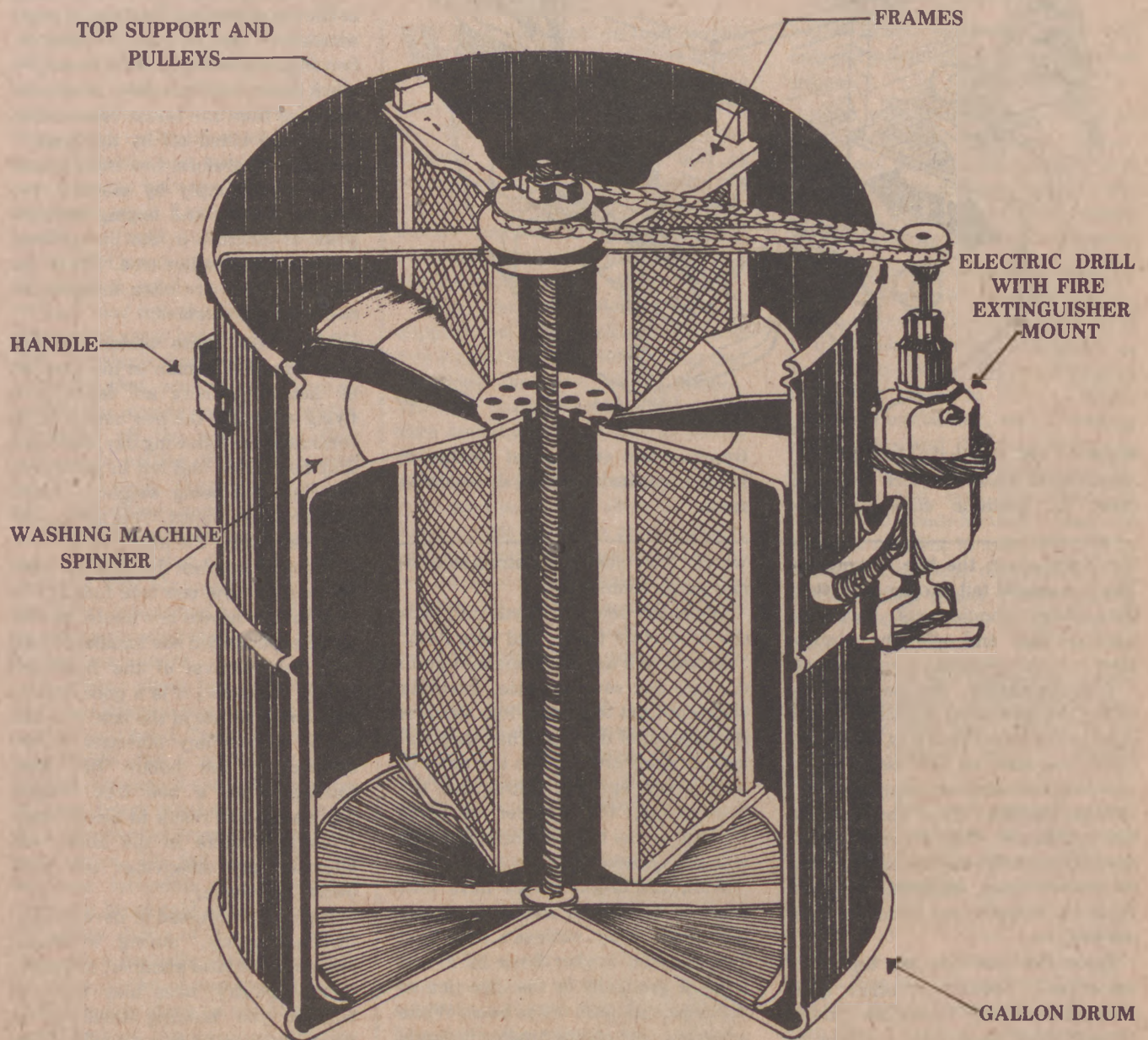
When at long last the goal has been reached and the bee tree found, it is wise for the novice bee hunter to look up an experienced bee handler to help with the removal of the bees and honey. However, it is a good idea to look up the owner of the land and find out if he has any objection to the removal of the hollow bee tree. Cutting down a bee tree without permission can result in heavy fines. Usually, a share in the honey will alleviate any misgivings the landowner may have.

If you're interested in developing a thriving apiary, during swarming season in the later summer, in town or in the country, bees may find you without you hunting them down. Keep people alert to your willingness to remove bees, and they become a windfall to fill your hives.

Before setting out on a bee hunt, be advised, however, that the bee tree will probably not be found in a matter of minutes. It may take hours or even days, if the bee tree is far enough away, or craftily concealed. But any way that the bee hunter goes about it—for fun, profit, honey or for the bees, you've got to agree: bee hunting is one honey of an idea! □

Susan Feldhake makes her home in Watson, Illinois.

A \$150 Honey Extractor That Costs \$15 To Build



by Jeffrey A. Fisher

It's called the Apel-Fisher Honey Remover. Chief designer and builder is Fred Apel. But even Apel admits at 73 years of age that there is little new about the Remover.

"I've seen the design before. I just built it better, simpler, cheaper."

The extractor will hold eight frames--four frames full depth, and four smaller (shallow or medium) frames. You can make the Remover accomodate six medium and two full depth frames if you like. The Remover has the following important features:

- *it's motor driven
- * it has an "automatic" clutch
- * it features centrifugal removal of honey
- * it's all metal and durable
- * it costs less than 10% of commercial models
- * it's made mostly from used or scrounged parts
- * there's no reversing necessary
- * it requires low maintenance and easily sanitized
- * it works!

Jeffery A. Fisher is a free-lance writer who lives in Patchogue, New York. Photos by Susan North Fisher.

The Remover's outer container was made from a "reject" 55 gallon steel drum. With the upper one-third removed with a friend's torch, the drum stands 24 inches high. It costs \$6.00 and the cutting job took five minutes! To be fancy, you can use a metal file around the new rim to smooth off any edges.

Handles were placed on the outside of the drum. We scavenged two aluminum ones from an abandoned boat, but anything strong will serve. Because of the size of the barrel, handles are necessary for convenient lifting and moving.

The "dynamic" center piece is an old washing machine spin cylinder. Ours was scavenged free. We have about

plastic from the bottom of an old bucket and placed it into the bottom of our spinner. The plastic can be sterilized. A few extra holes can be drilled into it to permit honey escape. The washing machine spinner already has holes, so no extra drilling is needed.

A five-eighths inch, galvanized, 26 inch long, all threaded shaft rod is mounted down the center of the spinner. Two nuts are fastened—one from the top, and one from the bottom to secure the spinner on the shaft. Have about $\frac{3}{4}$ of an inch extending below the bottom nut. All bolts and nuts I used were stainless steel. They cost under \$4.00, while the shaft and its nuts cost \$2.00.

The mounting device is simply top and bottom support



Designer Apel [left] and author, co-builder Fisher [right], go over details of their honey remover.

one-fourth inch clearance between the outer drum and inner spinner. Since the spinners are enameled they have a beautiful finish and don't need additional coatings. The drum can be primed with an epoxy-polyester clear finish. A pint can cost less than \$3.00. A galvanized drum is also acceptable.

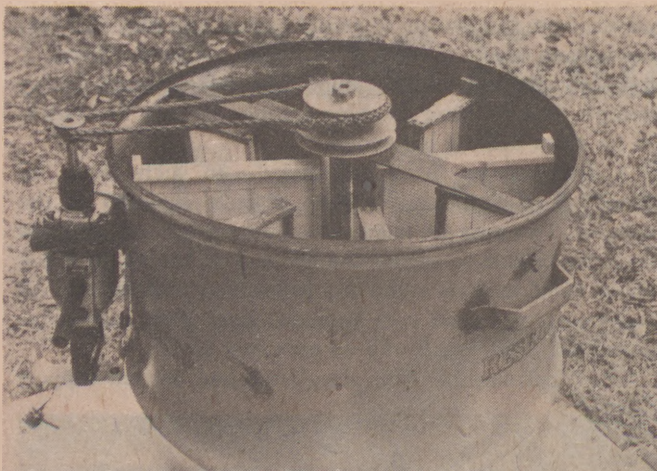
Turning the spin cylinder upside down, you cut slits to accommodate the number and sizes of frames you desire. We used a carborundum blade on a circular power saw. It may be necessary to cut out small "tabs" on the bottom edge to accept one corner of the frames. Remember that you must equalize the distance between frame slits to maintain weight balance. Note also, that you reverse the spinner—it's bottom in the washing machine becomes the top in the Remover.

Mounting the spinner in the drum is probably the most challenging job. We fitted and glued a strong piece of

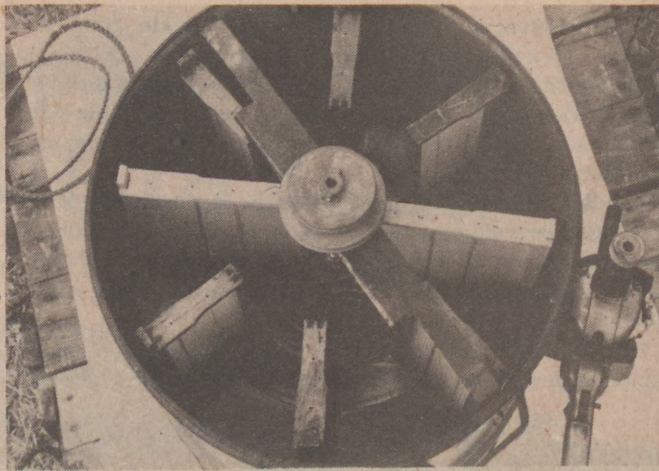
bars. Two $\frac{3}{4}$ inch ball bearings were "cannibalized" from an old wheel barrel. They are simply fitted into the holes drilled in the support bars. The bars were scrap flat iron and cost 50 cents. The bars are fastened to the drum with the stainless steel bolts. The spinner rests on the bottom support while the top one locks it in place. Measurement is crucial in hole drilling. Your spinner will wobble if you're not exact here.

At this point, you can fashion a hand crank and extract honey manually. In an earlier model we used a washing machine motor (2000 RPM) with a 10:1 gear reducer and some pulleys and belts. We achieved 200 RPM (ideal for honey extraction) but we felt the system was cumbersome and complex.

A far easier and simpler system is to employ your electric shop drill with a belt/pulley arrangement. An excellent drill mount is to fasten an old fire extinguisher



Whole view of remover, showing barrel, drill, pulleys, belt, shaft and top support. Spinner was removed and frames placed inside, showing eight frame capacity.



Top view of loaded extractor. Note two full depth frames and six medium depth. Top support bar shown with belts removed [upper left].



Fred Apel removing top support bar after pulleys are removed.

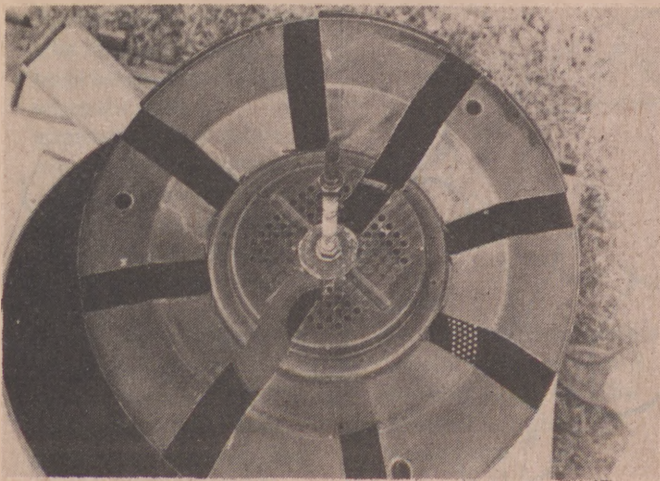


Designer/builder Apel removes spinner with frames in place by holding threaded, galvanized shaft.

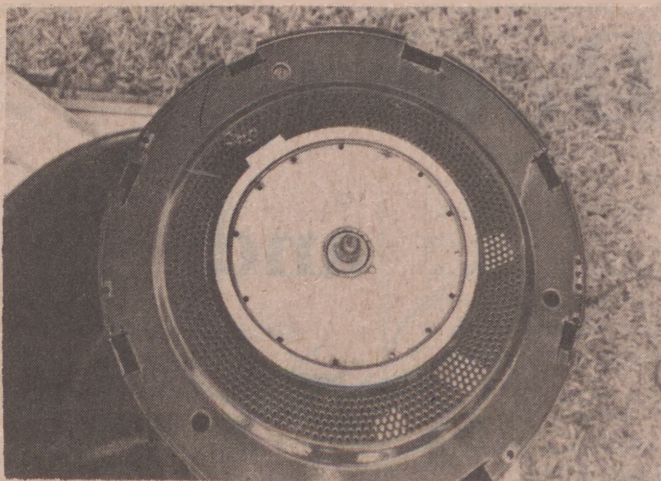
mount to the outside of the drum. This permits the drill to be snapped on and off easily. Be sure to place it at the proper height.

Our drill is a half inch with 575 RPM. By placing a three inch pulley on the shaft and a one inch on an old and broken drill bit, we achieved an approximate 3:1 reduction. Thus we estimate that our spinner turns 175-190 RPM.

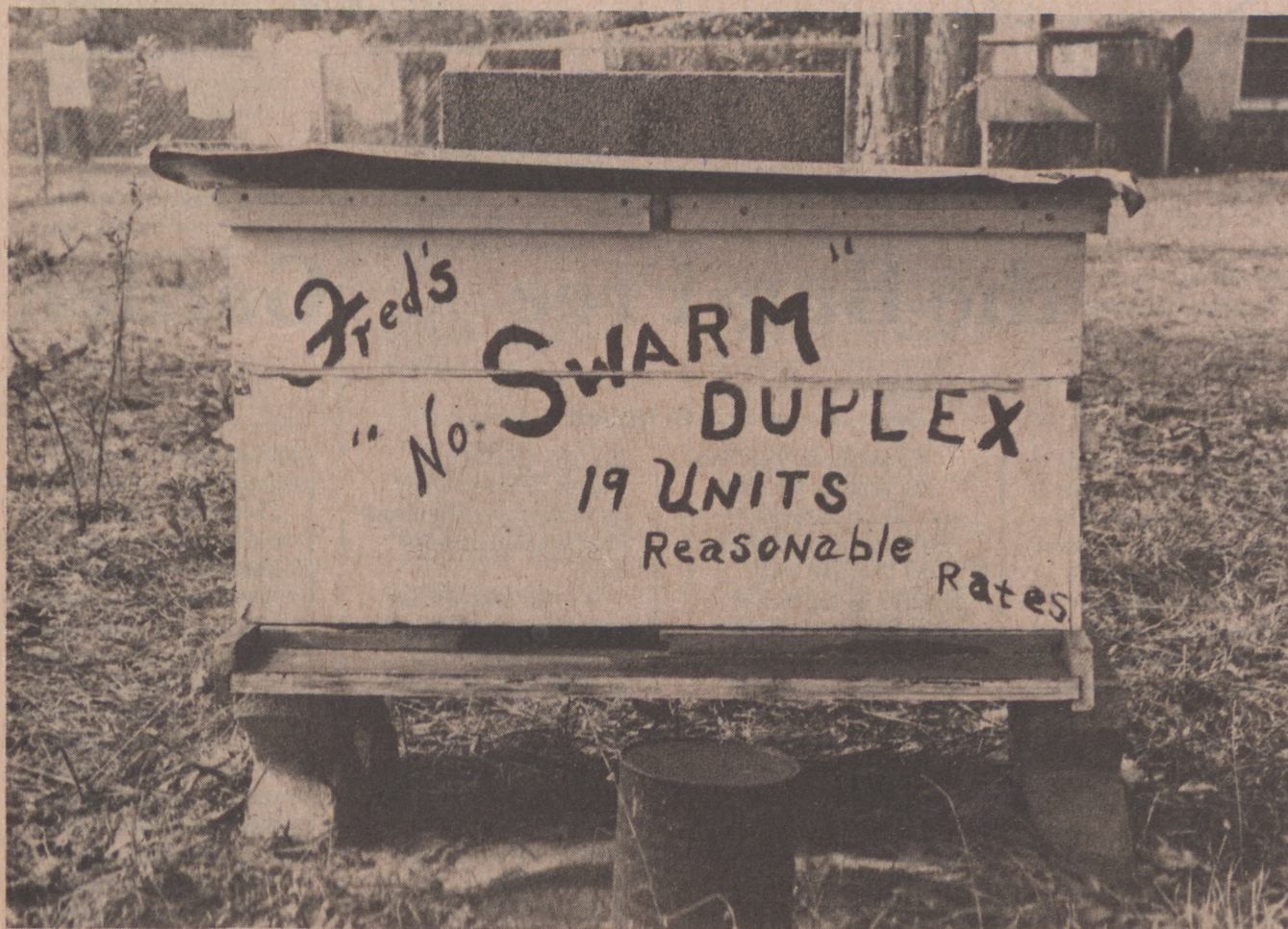
Our belt is a hollow braid polypropylene rope. It is slightly loose, so at slow speeds it slips. This slipping prevents honey comb damage from abrupt jumps when



Top view of spinner, showing cuts made with carborundum blade on circular saw. Shaft and nuts also visible.



Bottom view of spinner showing plastic insert and shaft nut. Note small tabs cut out to accomodate corner of frames.



Giant hive which necessitated designing and building colossal Honey Remover.

starting and stopping (our "automatic clutch"). No reversing is necessary! Honey is removed from both sides of the comb. We obviously did not include the price of our drill in the cost of the machine.

A final feature permits honey removal from the drum. We drilled a one inch hole in the bottom of the barrel. A simple wine cork makes a seal! We strain the honey through the hole, using cheesecloth and 60 mesh nylon cloth. The best cleaner for the Remover is the honey bee. Simply place the sticky machine in the sun near a bee yard. By the next day it will be spotless! □

Ducks

and



the Bug-Free Garden

by Betsy Hibbard

Ducks eat caterpillars. We found this out in the spring when we were twisting down tent caterpillar nests and scraping them on the ground to step on them. It doesn't work very well to burn the nests; the worms rain down on you, some fried, and some only singed and still wriggling. Besides, fire is hard on the trees.

The ducks happened to be there as we rubbed the sticky tents off the poles we were using, and they poked at the mass of wriggling worms, but turned up their beaks at them.

"They need coaxing," I said, and peeped at them a little, the way a mother duck does, while tossing

single worms at their feet.

The runt ate the first one. He was always crowded out of his share of the food and was inspired by the lack of competition. The other ducks, not to be shown up, nibbled a few, but they weren't really crazy about caterpillars. All that good protein wasn't going to be wasted if I could help it, so I starved the ducks a little. You can't really starve a ranging duck. They are very good at feeding themselves. But they got no duck food for two days, and they were accustomed to coming at call to get a good handout. They began following me around, plaintively peep-peep-peeping, expecting their pellets. I gave them caterpillars instead of pellets, and it never crossed their little duck minds to question

me. The unkind ruse worked. They gobbled down the caterpillars and even seemed to relish them.

We had been a little nervous about letting the ducks know we had a garden. We had no way to keep them out, you understand, but we always fed them down by the pond, figuring they didn't have to know everything about the place. Never underestimate a duck.

When they spent two hungry days begging food from me their range was suddenly extended. Have you ever tried to shoo a hungry duck? And I had to hoe and pick in the garden, and they found all of the nooks and crannies I'd been keeping kind of private. I wasn't happy watching them duckfoot all over the seedlings, but they don't weigh a lot.

Their feet are so big they didn't damage the plants. Their webs sort of spread the load, and most of the plants sprang up again. Even though they pecked a little at the plants, they didn't eat them much at all. One or two strawberries each seemed to satisfy them. They loved chickweed, which was handy, but mostly they ate bugs and slugs.

It was a treat to call them to the garden when I picked the pea rows. Those peas were loaded with slugs, and I only regretted we didn't have more ducks, because we had enough slugs for a hundred. Our fourteen did the best they could. You can only eat so many slugs.

They never bothered going into the potato patch. Since our soil has improved we have no potato bugs. They love

Betsy Hibbard lives in La Plume, Pennsylvania.

squash bugs, and we have a lot of those. Squash bugs tend to jump away when they are approached, but rarely escape the determined beaks of fourteen ducks. Three beaks descending on one bug means one duck scores every time.

The ducks fought over asparagus beetles. I walked down the rows whacking at the fronds with a whisk broom. The ducks devoured every beetle and worm that hit the ground. Ducks soon learned to root around for cutworms and other creepy crawly things in the garden. They even chased moths. More power to the ducks!

I ran out of duck food one day, so I gave them a little uncracked horse corn. That was a big mistake. At the evening feeding one duck was missing and I found it dead in the blueberry patch, its little soft body still warm, and not a mark on it. Artificial respiration didn't work, and I couldn't figure out how to breathe down its beak. The duck was hopelessly dead.

I drove over to Irene's, my neighbor who knows everything, with the poor little duck on my lap, hoping my body warmth might miraculously resuscitate it. The least I could do for my feathered bug exterminators was find out how to keep them from sudden death.

Irene said, "Shall I do an autopsy? That's the only chance we have to find out what happened."

"Yes," I said miserably.

Irene only made that offer because she loves me; she can't stand to kill her own ducks. She makes her cousin do it on the weekends. We don't have a cousin to kill our ducks, so John does it. He



learned how from Irene's cousin. John has to do it because I go to bed like Sheriff Finn when the time comes.

The first time John butchered ducks was very hard on him. It took him a long time, and he and Cole plucked them and did all the things one does at a time like that. They proudly brought me the first carcass. I picked up the naked little thing and hugged it, saying, "Oh, my poor little ducky."

John and Cole never said a word. They just looked at me.

Irene predicted that something had stuck in the duck's craw, and it had choked to death. I thought of the horse corn. I felt terrible. The autopsy proved Irene was right. It was the corn. How could I have been so stupid? The poor duck. Suddenly, I was anxious to get home to see if the other ducks were dead or dying.

Thank goodness thirteen ducks were brightly waiting for me as I drove in to give them their belated feeding. They plucked at

my boots and trousers, flapping their big feet--slap, slap, slap on the driveway, and swish, swish on the grass, all the way to the pond. As they crowded and shoved each other to get the food, I remembered the dead duck's gizzard had been full of corn and Japanese beetles! The sight of the corn was so distressing, I had completely overlooked the significance of the beetles.

When I had time, I caught beetles and killed them in a can of water with a float of kerosene on it. The best time to get them is at dusk when they are clustered together, and not so wary as they are during the day's heat. The next time Carl mentions sex on the farm, I'll show him the beetles. They spend so much time paired off, one on top of another, that I don't know when they eat. Do they take turns eating, or do you suppose the bottom one is doing the eating?

So, maybe the unfortunate little duck didn't die in vain. Now, every day I call the ducks, I walk with them down the grape row and shake off Japanese beetles, right

into the eager beaks of thirteen ducks.

Those ducks also love grasshoppers. They line up like beaters on a tiger hunt, and waddle slowly across the lawn and fields, lunging at the leaping grasshoppers. They get a lot of them too, because when I follow behind them, no hoppers leap away from my footsteps.

Ducks also eat clover in the lawn, and richly fertilize it too, and they eat earthworms that surface during a rain. We always get a lot of worms on the driveway after a rain, and I spent much time picking up worms because I hated to see them dry up and die in the sun. Once they get on a hard surface, they never find their way back to the grass, so the ducks do the job for me, and the worms die a quick death, and fatten the ducks as well. Worms are very nourishing.

It does bother me, however, to see the ducks eat my blueberries. When they've cleaned up the ones they can reach from the ground, they start jumping. Ducks are good jumpers, which is something else I never knew.

But --heck--we've got lots of blueberries. Ducks like variety as much as we do, so they never eat many at one time. I was going to prune off the lower blueberry branches for easier picking, but the ducks may as well have them. It saves me the pruning job, and it's so comical to watch the ducks leaping up and down in the blueberry patch that I don't have the heart to make them stop.

Besides, you can't train ducks to do much of anything but eat. They're very good at that. □



HEALTH and the HOME GARDENER



How to Make Great Garden Soil

by Joe Smillie

The basic premise of an ecological approach to gardening is that a healthy soil produces healthy plants, which in turn will provide nutritious food for people. A healthy soil is one that is teeming with varied life-forms. This biological act-

ivity in soils is dependent upon the physical structure and the mineral balance. A healthy soil is characterized by a complex of inter-dependent micro-flora, micro-fauna and mineral cycles.

A Hidden Universe

In just one gram of soil there are 20 million bacteria, one million fungi, millions of actinomycetes and 800,000 algae. These invisible agents are only the major forms of micro-flora. Soil animals in the same gram include one

million protozoans, such as amoeba, ciliates and flagellates. Snails and slugs, various arthropods, some vertebrates and the all-important earthworm, make up the balance of the population. As fertility increases, so does the number and variety of soil life. The scope of this hidden universe becomes greater as one delves into the details of species, life-cycles, feeding habits, enzyme systems and defense mechanisms of the micro-organisms. It takes a soil microbiologist, armed with a scanning electron microscope, to peer into the ecological

Here is the second in our continuing series on "Health and the Home Gardener." This article is by Joe Smillie who works for Eaton Valley Agricultural Services and lives in Quebec, Canada.

“Instead of forcing the garden to conform to our theories, some of this time would be better spent in observation. We need to

change our approach from one of manipulation to one of nurture. Only then can we create a harmonious balance.”

niches that spawn this wild metropolis.

While the gardener can't see or even realize the complexity of these life-cycles, his or her job is to nurture them. The gardener must build a suitable habitat for soil life so that they, in turn, can create a fertile soil. There is no one way of doing this. The differences in climate, geography, soil type, financial resources, access to material, amount of leisure time, physical ability, equipment and especially the mental attitude of the gardener, dictates how each garden will develop.

What's Your Style?

There are as many methods of gardening as there are gardeners. Surprisingly, many of these methods, often contradictory, can lead to a healthy garden soil. The organic approach stresses the importance of incorporating large amounts of organic matter in order to create a healthy soil. Many farmers simply back the manure spreader up to the family garden and “let fly!” Some gardeners feel that the purchase of a blended artificial fertilizer each spring will feed their plants adequately. Other gardeners, revolting against artificial fertilizers, dump on bags of crushed rock powders, natural phosphates and other soil amendments, relying on the “natural” minerals. Some green thumbs feel that raw animal manures are the best fertilizers possible, while other plant lovers do not allow any animal by-products to enter their garden soil. There are even gardeners who believe that the addition of any foreign material harms the health of their garden, while many older gardeners just add mulch each year and state that any tillage of the garden is unnecessary.

Many of these different approaches can lead to a healthy soil, something

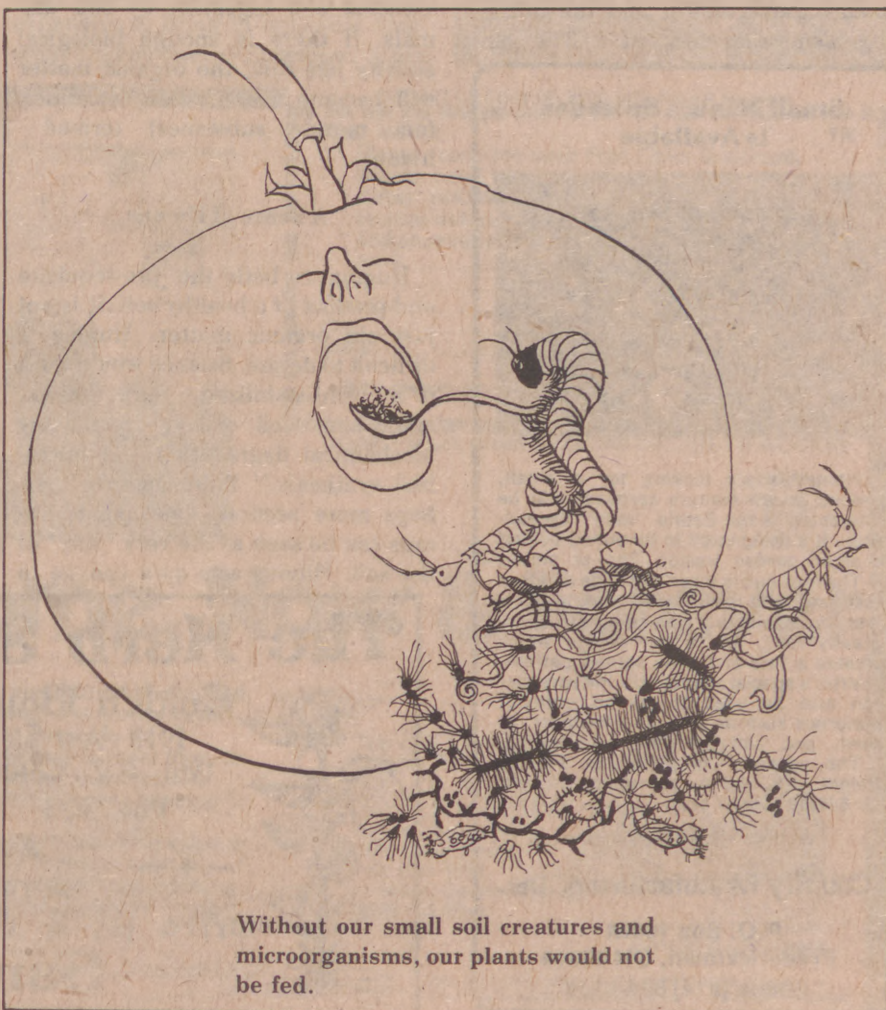
more often due to the energy of the gardener rather than the efficacy of the method. The strictures of any one gardening method, however, can lead to the over-emphasis of a single factor and risk the danger of imbalance. Good gardening is a matter of balance, or as the old saw goes--“moderation in all things.”

Over-Doing Can Be Deadly

Gardeners often do too much. The adage of ‘more is better’ has caused untold harm. Adding too much old hay, cultivating too

often, pouring limestone on the garden out of a bag, roto-tilling twice to get a fluffy seed bed--are just some of the sins many of us have committed. Truly unpardonable are the deadly over-doings of artificial nitrogen, insecticides, fungicides and the lamentable practice of soil fumigation.

Instead of forcing the garden to conform to our theories, some of this time would be better spent in observation. We need to change our approach from one of manipulation to one of nurture. Only then can we create a harmonious balance.



Without our small soil creatures and microorganisms, our plants would not be fed.

"The dumping of organic matter and minerals into the garden will not insure healthy soil."

Building Healthy Soil

In order to build a healthy garden soil in a new garden or improve the soil in an established site, it is useful to understand the physical structure of soil, the importance of organic matter, the creation of humus and the balancing of mineral content.

Any soil can be built up into a healthy garden. Soil was created by the chemical "magic" that resulted when the physical weathering of rocks progressed enough to allow for the biological action of plants and microbes. Glacial drifts and earth eruptions, wind and water movements and freezing and thawing broke down the earth's crust until primitive plant forms could gain a foothold and some nutrients from the fine rock particles. Soil evolution depended on the cyclical inter-play between powdered rock, dead organic matter and the micro-organisms that decayed it. The gar-

dener should imitate nature by balancing these mineral, vegetable and animal factors.

The dumping of organic matter and minerals into the garden will not insure a healthy soil. The addition of organic matter and minerals to a poor soil is necessary to enrich it, but these materials must be processed or transmuted into a final product or synthesis in order to create true fertility.

Organic matter consists of vegetation in various stages of decay. Organic matter is a necessary building block in soil structure. The channels and pores created by organic matter provide the necessary habitat for micro-life. Organic matter is the food source for all soil life and thus fuels the whole soil eco-system. Some of the organic matter goes through cycles of decay, digestion by soil bacteria and ingestion by soil animals. If there is enough biological activity like this, the organic matter will become the life-form condition (not merely substance) termed humus.

A Sense of Humus

Humus is both the pre-requisite and product of a healthy soil. It is not just old organic matter. Humus is difficult to define. Science would term it "a semi-stabilized, dark brown, amorphous soil colloid created by biochemical degradation and microbial synthesis." From another, perhaps more accurate, viewpoint, humus can be seen as the very "life" of the soil. Humus acts as a sponge in

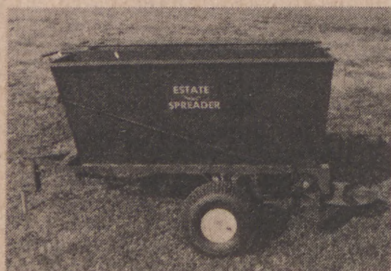
the soil, both holding water and allowing for aeration. Humus is the glue that binds minerals and organic matter into a crumb-like soil structure. Humus is the middleman that provides the nutrients that it holds by electric charge, for plant roots. Humus stabilizes and buffers the soil eco-system.

The art of creating healthy soil is to insure that organic matter and minerals are acted upon by soil micro-organisms, thus causing humus to be created. This is the same process that occurs in a correctly-built compost pile. With the help of good compost, the gardener can establish the conditions for humus creation in the soil.

In order to implement the humification process in the soil, the correct balance of minerals is necessary as well as the decaying organic matter. The micro-organisms that bond the minerals to the organic matter during the humification process, need certain minerals in order to function and proliferate. For example, it was often thought that pine needles did not decay because of their resin content, but later it was found that they just did not contain the calcium necessary for bacteria to digest them. The soil bacteria eat first and then the minerals in their decomposed bodies will be more available to plants. The idea is to feed the soil so that it can feed the plant.

Unfortunately, the concept of fertilization has become identified with the broadcasting of N-P-K mineral fertilizers. Too much emphasis has been placed on minerals since the rise of artificial fertilizers. The correct ap-

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proach is to stock the soil with mineral reserves that the parent rock did not provide or that have been leached from the soil. Just how much, and which minerals we should use, depends on the capacity and the biological activity of each individual soil. The only accurate way to determine this optimum amount is by a complete soil test.

Upgrade Your Soil Test

Most government tests and soil test kits simply measure the gross amount of minerals in pounds per acre and grade them abstractly as low, medium or high, without letting you know exactly what is the soil's capacity to hold minerals. A certain level of potassium may be too high for a sandy soil, but too low for a soil rich in humus. A complete soil test gives the pH, the capacity of the soil, a read-out of the main minerals, the ratio and percentage of certain minerals and the quality of the humus and organic matter.

The key minerals are the positively-charged ones that are held by the humus: calcium, magnesium and potassium. There is a desirable ratio between these minerals. Most agron-

omists agree that the soil should hold 60-70% calcium, 10-15% magnesium, and 3-5% potassium.

Calcium is a basic soil and plant nutrient needed in large quantities. Most Northeastern soils are acid; that is, the pH is often below six. In order to sweeten the soil and provide the much-needed calcium, limestone is the best known and cheapest source of calcium. While it has been used in agriculture to raise the pH because of its carbonate content, it is even more important because of its high calcium content. Most vegetables enjoy a pH range of 6.2--6.5, but plants could not grow in a soil whose pH had been raised by sodium bicarbonate. Calcitic limestone contains calcium, while dolomitic limestone contains both calcium and magnesium. Natural phosphate rock also contains significant amounts of calcium.

Magnesium is the core atom in the chlorophyll molecule. Its deficiency in Northeastern soils often goes unnoticed or is ascribed to a lack of nitrogen. This deficiency has often been caused by the addition of too much calcitic limestone. If the pH is high enough already, or it is too expensive to bring in dolomitic limestone magnesium deficiencies, it can



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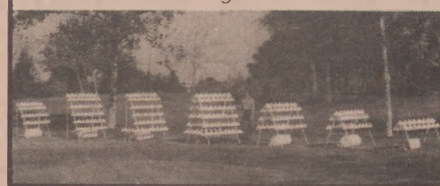


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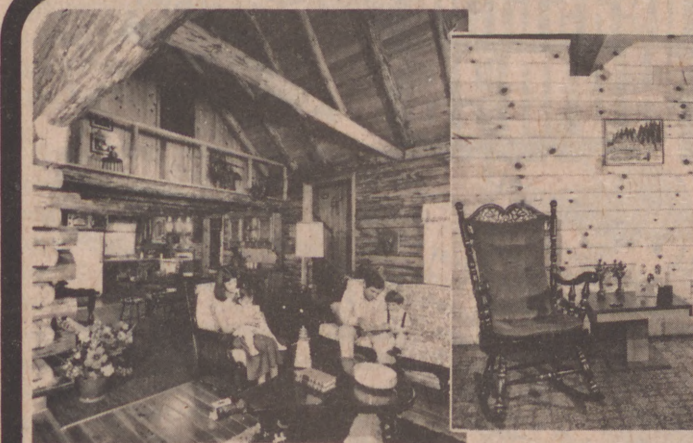
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be corrected by Epsom salts or Sul-po-mag. Epsom salts are strong medicine and should be used judiciously. Sul-po-mag is a trade name for sulfate of potash-magnesia which is a crushed mineral. This mineral is a soluble salt that contains 11% magnesium and 22% potassium.

Potassium is usually supplied in organic gardens by manure and decaying organic matter. Potassium is very susceptible to leaching and may have to be re-stocked. Unleached wood ashes are a good source of potassium and calcium. Sul-po-mag is another strong source of potassium especially useful in a soil that lacks potassium and magnesium. The potassium in conventional artificial fertilizers is also a crushed mineral but contains large amounts of chlorine which is harmful to soil life.

A complete soil test also measures the soil's reserve of phosphorous, usually low in the Northeast. Phosphorous is a lively element that wants to combine with metallic ions in the soil to form insoluble mineral compounds. Conventional phosphate fertilizers are made from phosphate rock that is treated with acid to concentrate

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it and make it soluble. This 'artificial' phosphate does not remain soluble long; some is lost by leaching into streams and lakes. Much becomes unavailable to plants.

Natural phosphate fertilizers are simply crushed rock or colloidal phosphatic clay. Phosphorous is only available to plants in a soil where the biological activity is high since soil life-forms incorporate mineral phosphorous into their tissue, making it available to roots on their death. The best approach is to mix untreated forms of phosphate with manure and organic matter before application to the soil. The colloidal form of phosphate seems to be more available because of its fine particle size and clay nature.

Trace Minerals

Most soil tests do not measure trace minerals except on special request. If the major minerals are balanced and biological activity is increased, there is usually no problem. Now modern science is discovering that the role of trace minerals in the intricate balance of the soil is extremely important. Minerals such as zinc, cobalt and selenium are necessary to the proper functioning of soil plant and animal metabolisms. Once again, the idea is to help nature balance mineral flow rather than manipulate mineral levels from bags of soluble salts.

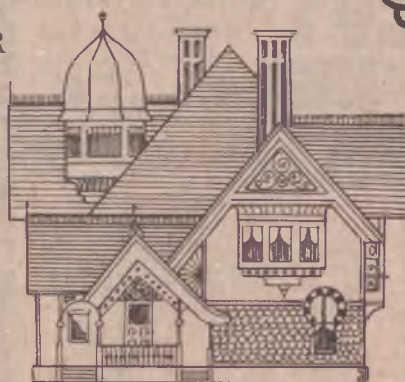
Some soils may be low in a particular trace element due to the nature of the parent rock formation, but most deficiencies are caused by a lack of recycled organic matter and the unbalanced application of soil minerals. For example, if too much calcium and potassium are applied, magnesium will be relatively low; too much calcium makes iron unavailable, and high levels of phosphate drive off zinc. However, in most cases, the application of trace minerals is not necessary. Crushed rock powders like granite dust and natural phosphates contain a wide variety of trace minerals. Liquid seaweed extract contains more than 60 minerals and can be applied to the soil or plant to help remedy possible deficiencies.

Last, But Not Least--Nitrogen

Nitrogen is usually the first item on everyone's list of mineral tilizers. A good supply of nitrogen is essential for all plant

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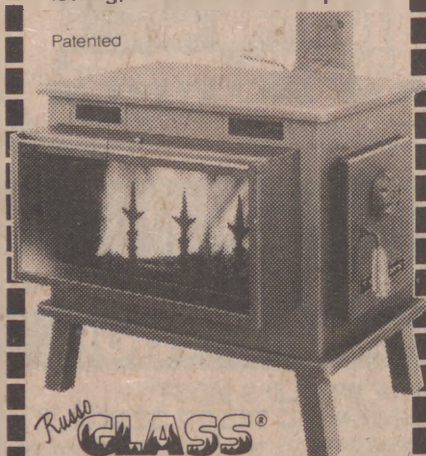
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growth, but this element is last in this list because it should be present in soil as a result of good gardening practice rather than added from a bag.

Nitrogen (as we often forget) is a gas, not a mineral, and is a very elusive, highly mobile, plant nutrient. The creation of an effective nitrogen cycle in a garden soil is the result of a balanced mineral content and humification process.

After the gardener has stocked the soil with an optimum ration of minerals, the addition of organic matter should be synthesized by the micro-organisms into humus. In order to insure that this process occurs, the addition of quality compost is necessary. Compost is made by layering organic matter and animal manures in piles of specific size so that the micro-organisms, with adequate air and moisture, transform the material into humus. While the intricacies of composting is an essay in itself, it is this composting process we wish to initiate in the soil.

A healthy garden soil can be created quickly by the addition of huge amounts of well-made, mineral-balanced compost. This massive

operation is usually beyond the financial or labor-restraints of most gardeners. A small amount of compost (50 pounds per 100 sq. feet) will act as an innoculant in garden soil just like a yoghurt culture in warm milk or a wine yeast in crushed grapes. Compost is the only necessary annual addition after mineral balance is established. While it is best to compost all organic matter and manure if the time is available, a biologically active soil can digest this material and transform it into humus.

Another source of nitrogen for garden soils is green manure. This is any crop grown for the purpose of incorporating it into the soil. Discretion is the key talent here. Tilling in a lush green crop of buckwheat or clover can give the soil a massive stomach ache. If the soil is not in a healthy state, it will not be able to digest this wet mass. Instead, fermentation and putrefaction will take place. It is best to cut and dry the green growth before tilling it in. If that is impossible, the growth should be roto-tilled down into the surface and a second pass should incorporate it into the soil after a few hot dry days.

The use of legumes as a green manure or cover crop is another

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source of nitrogen, since the nitrogen-fixing bacteria in their nodules entrap nitrogen from the air. Legume crops should also be prominent in the garden rotation plan.

To Till, Or Not To Till

There are gardeners who do not till their soil at all. In England the "no-diggers" believe that all tillage is harmful to the soil system, while those advocates of heavy mulching in North America say that tillage is just too much work. Most gardeners, however, do till. The people with small gardens use the ideal tool—the spading fork, while others resort to the roto-tiller. Country gardens are often plowed. While plowing is necessary in starting a new garden by destroying the old sod, the plow should not be used after this initial step. Its many disadvantages include the burying of the living layer of soil micro-organisms six inches under where they perish from lack of air.

The roto-tiller mixes weeds and residue into the top layer of the soil where they can be decomposed. The tiller, however, can easily destroy soil structure and soil life if used too often or in wet conditions. If roto-tiller

wheels hold mud, it should not be in the garden. Evidence is also accumulating that shows the roto-tiller creates a hard-pan or soil layer that many roots cannot penetrate. The roto-tiller should be used only for tillage, not cultivation.

Many gardeners like to till their garden in the fall for a quick start in the spring. Others like to leave the garden with a beard of late fall weeds, or possibly a cover crop, like fall rye. In the spring, this is tilled in as green manure. Climatic as well as soil conditions should dictate the approach used. Raised beds need less tillage attention, increase biological activity and help Northern gardeners off to a fast start in the spring.

True fertilization is the effort made to increase soil vitality. There is much truth to the Confucian statement: "the best fertilizer is the footsteps of the farmer." There is no simple answer to the complex needs of the soil. A soil management program can be scientifically delivered from a computer or spring intuitively from the mind of a first-year gardener. A healthy garden soil is the result of a gardener who is able to view the living soil as a whole greater than the sum of its parts. □



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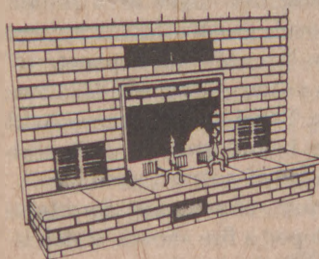
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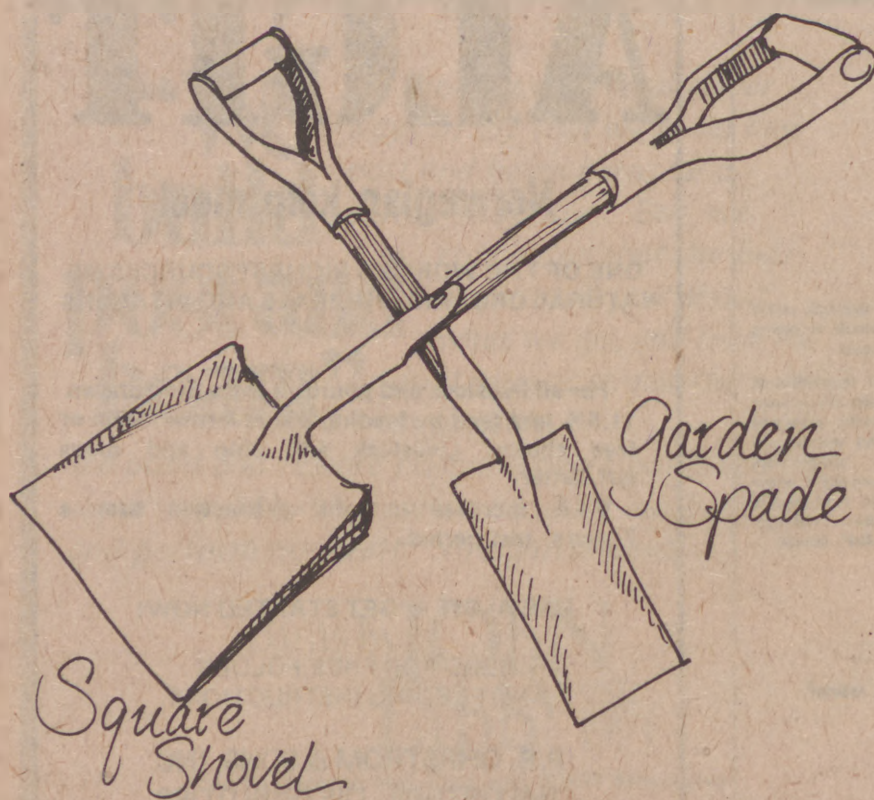
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Choosing the Right Shovel



Bill Bateman lives in Barrio, Ontario.
Illustrations by Liz Buell.

by Bill Bateman

Would you consider stirring your coffee with a serving spoon? Or better still, try eating thin soup with a teaspoon? Somehow, I don't think you would relish either of these ideas any more than I would.

The differences in shovels are just as great as those in spoons. To a person fresh out from the city, a shovel is only a shovel. But after trying to remove snow from a long country driveway with the standard round mouth shovel, one's mind is permanently changed. At least the question will be asked: "Isn't there a better way?"

If you're not really too familiar with shovels, perhaps a rundown of different types and uses is in order. For all practical purposes, there are three basic types of shovel heads, and two types of handles. What's more, there are one or two special purpose tools that may not fit exactly into these categories.

Let us first take handles. They are either long and straight or short with a "D" grip. Some shovels come with either, and some with only one type. Of course, at an auction you may find one that some country cobbler has custom designed for a special job.

By far the most common shovel is the round mouth with a long handle. Primarily, it is used for digging, moving or loading sand, soil, gravel and crushed stone by hand. It is a great tool for levelling uneven ground, or spreading sand or gravel. With some practice you can throw a shovelful a distance of ten feet, and either leave it in a small pile or spread it to fill a small hole.

Sharpening the edges of a round mouth shovel greatly increases its usefulness. Not only will it penetrate hard earth easier, but it will also cut small roots. This lets one remove sod, cut weeds below ground level and trim the sides of a round posthole.

With a few refinements, foresters have developed a fire shovel, which is very useful in the hands of an expert when fighting forest fires. This is just one of many specialised uses.

A round mouth shovel with a "D" grip on a short handle can do many of the things a long-handled one can do. However, it's basic use is for digging, especially in close quarters such as a well, a trench or a hole for a corner fence post. This short-handled, round

mouth shovel is also handy for carrying in cars or trucks when you travel muddy country roads.

The square mouth shovels are usually used around buildings where they can be used on level floors. Because of their construction, they are more apt to be used for scraping or carrying, than digging. A square shovel is handy for moving hard packed snow.

One square shovel that is used for digging is the garden spade. It is a very efficient, short-handled digging tool. Not only can it be used for digging up the garden, but when sharpened, is wonderful for edging the flower bed, for example.

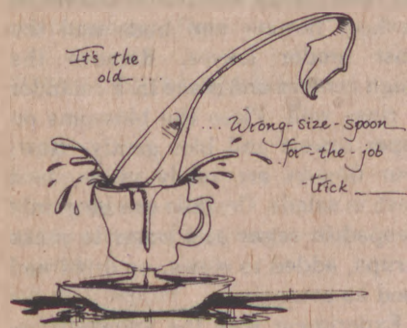
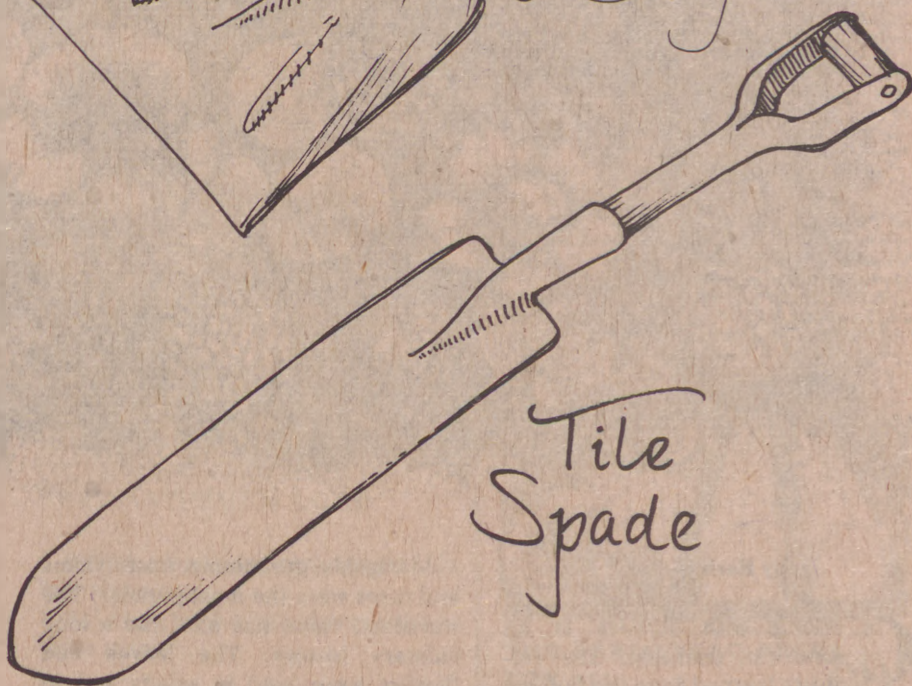
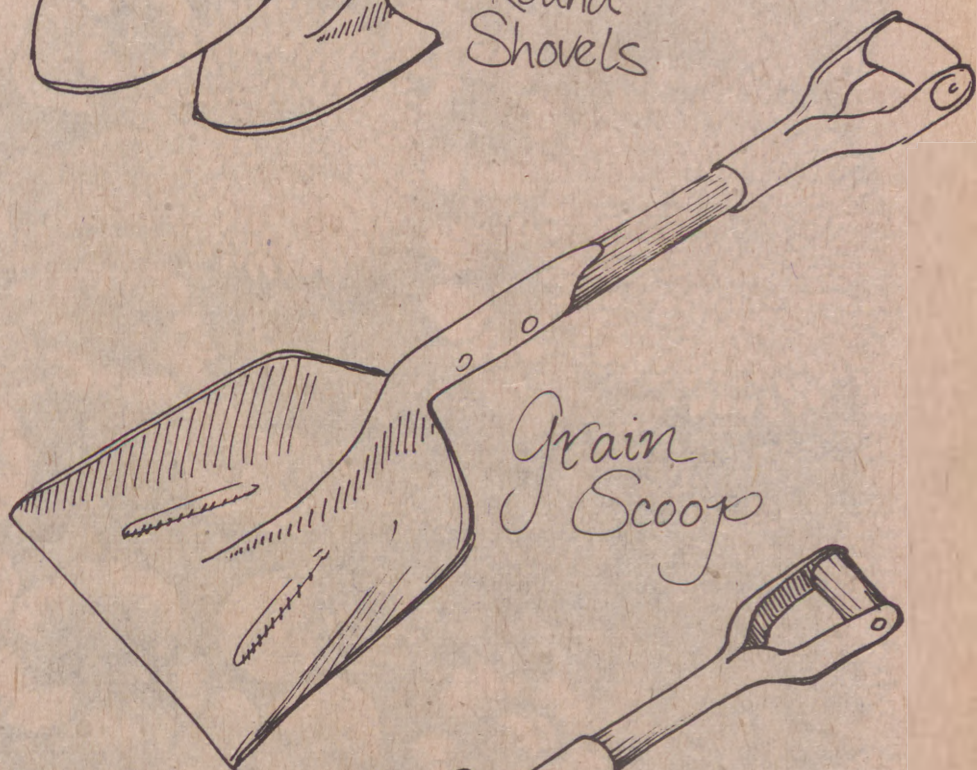
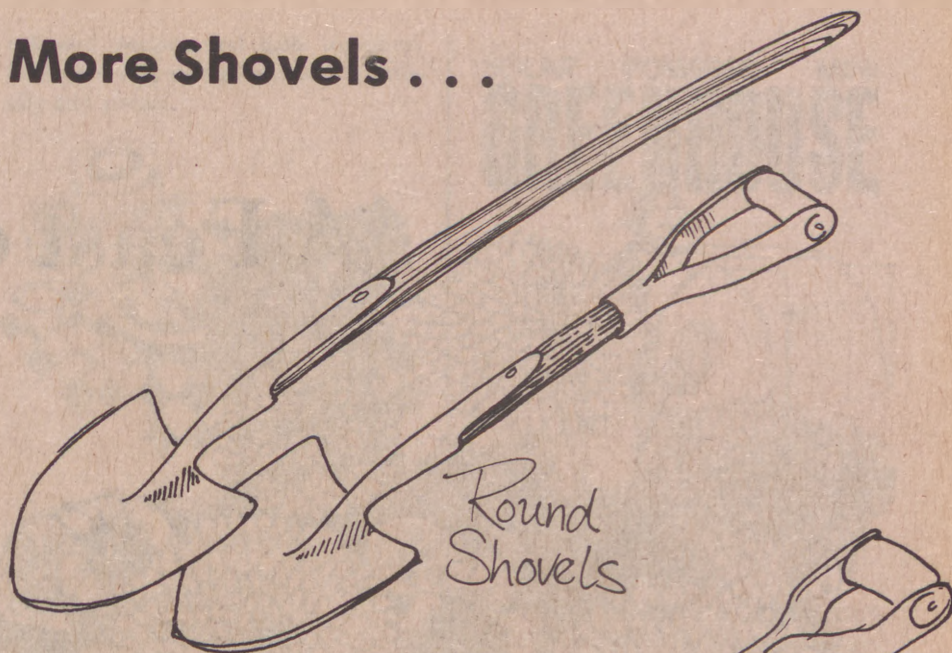
Scoop shovels usually come in two sizes and two materials. All have short handles. A large steel scoop is used mainly for grain, while a small aluminum one is handy for carrying in the trunk of your car in winter. Both can be used for shovelling or carrying material that is not too heavy and that does not require much digging to load the shovel.

In these days of mechanization, you may never have seen a tile spade. But if you have only a short run of tile to lay, such a spade can save you a lot of work or a lot of money. It was made to save digging a trench wide enough to work in all the way down to the full depth the tile was laid. The wide trench was only dug down perhaps two feet, and the tile spade is used for the last foot and a half or so

The blade of the tile spade is about five inches wide by eighteen inches long, and rounded at the end. Handles are short and sturdy with a "D" grip. This gives a tool that not only can chop hard earth but is also strong enough to lever a small rock. Tiles are lowered into this narrow trench with a tile hook, a tool quite often homemade simply by putting a bent rod in a hoe or shovel handle.

Just to know the difference between a spade and a scoop shovel, a

More Shovels . . .



hay fork and a potato digger, is not enough. Ultimately, a tool must prove itself; otherwise, it remains only a potential, like a person's talents. Finding the right tool for the right job,

and then doing that work well, is actually an art. No matter how humble our task, it is in the perfection of that art we reap the satisfaction: "It serves the purpose."

A Feast of Flowers



by Barb Mraz

Cooking with flowers is an American tradition. The colonists learned from the Indians how to use dried leaves, buds and the roots of wild flowers. Many flowers in early American gardens were planted in vegetable or small kitchen gardens.

Barb Mraz resides in Willoughby Hills, Ohio. Illustrations by Carol Varin.

Marigolds, geraniums, nasturtiums and roses were the most popular. The woodland violet has also had a long culinary history. The leaves and flowers were used in salads and to thicken soups. In the South, violets are called "wild okra." Violet leaf tea was a popular drink in the Old West.

Gather blossoms from the woods or your own garden, or a garden you know has not been heavily sprayed with insecticides. Look for violets, nasturtiums, calendulas, marigolds,

day lilies, pinks and roses. Select the freshest flowers and buds and the most tender leaves. Remove the tough centers and place in a colander to rinse well. Place the blossoms on paper towels and blot gently. Now, your flowers are ready to be used fresh in salads. Or, they can be gently steeped in sugar and water to make syrups, added to stews, or dried and used as seasonings.

Experiment with the known-to-be-safe varieties. Some flowers are

poisonous. These are: the crocus, daffodil, lily-of-the-valley, rhododendron, poinsetta, wisteria and jack-in-the-pulpit.

The most well-known edible flower is the dandelion, but the greens are not the only choice delicacy from this plant. Plump dandelion buds are delicious sauteed and tossed with crumbled bacon. Here are some flowerfull and flavorful recipes you may wish to try, and in doing so, add an exotic touch to your table.

CREAMED DANDELIONS

4 cups of dried young dandelion leaves
A dozen or so dandelion buds
1 teaspoon of salt
1 cup of sour cream (or plain yogurt)
Dash of pepper and paprika

Mix leaves and buds. Sprinkle with salt and pour sour cream over them. Dash on the paprika and pepper. Serve at once and toss the salad at the table.

DAY LILY SOUP

2 quarts of water
2 tablespoons of oleo
1 sliced onion
3 or 4 carrots
dash of pepper and salt
1 cup of day lily buds, washed

Heat oleo in pan and add vegetables. Add salt, pepper and the water. Simmer slowly until vegetables are tender. (About 45 minutes.) Add the day lily buds and simmer gently about five minutes.

LILAC SENSATION

2 dozen lilac blooms washed and cored
½ dozen beaten egg whites
Cup of granulated sugar

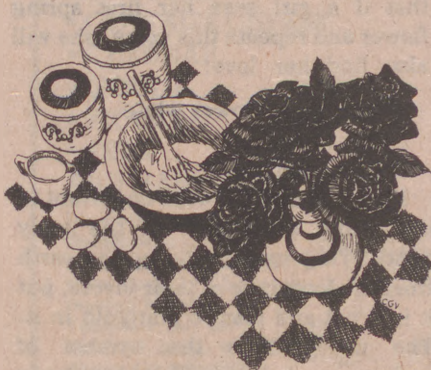
Dip dried blooms in egg white and then in the sugar. Set aside to dry until firm. Use as a centerpiece or as a cake or dessert mold garnish. This can be eaten, of course.

CHRYSANTHEMUM EGGS

6 eggs
¼ cup milk
2 tablespoons of oleo
¼ cup chopped chrysanthemum petals
Salt and pepper

Melt oleo in the pan. Beat eggs,

salt and pepper and milk together. Scramble egg mix gently and gradually add petals.



CALENDULA DUMPLINGS

2 cups sifted flour
6 teaspoons baking powder
1 teaspoon salt
¼ cup dried calendula petals
2 eggs
1 cup milk
2 cups bouillon

Sift flour with baking powder and salt. Break eggs into cup and fill with milk. Beat and mix into dry ingredients. Heat bouillon and bring to boil. Dip spoon into hot bouillon, then fill with batter and drop into bouillon. Cover and cook two minutes, turn dumplings and cook two minutes more. Or, dumpling batter may be dropped into cooked stew or soup.



CHRYSANTHEMUM SALAD

1 pound lettuce or fresh spinach in bite-size pieces
1 or 2 cups fresh-washed chrysanthemum petals

DRESSING

½ cup honey
1 cup sour cream or plain yogurt
4 tablespoons
3 tablespoons horseradish
dash dry mustard
salt and pepper

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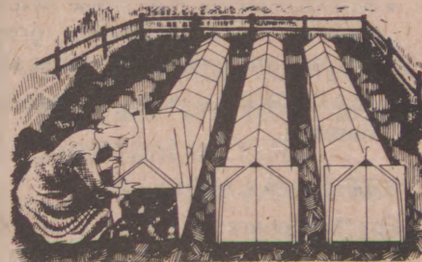
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Flowers also have a history of being used as love tokens and potions. There is an old American tradition that if a girl sees her first spring flower and repeats this verse, she will also find her love:

Flower pink, flower white
 I wish to see
 My love tonight.

Love and flowers were important to the young slave girls in the early South. They used to dig up the earth from the footprints of their lovers, put it in a pot and plant a marigold in it. The marigold is the symbol of endurance. A love potion was made from early spring flowers.

Another flower with a culinary history is the yellow pond lily. Klamath Indians of the Northwest regarded the time of the ripening of this water flower with religious fervor. Ceremonial dances were held before all tribe members participated in harvesting the ripe seeds. The kernels were ground into flour or roasted. Rootstocks were usually boiled or baked.

Here are some more flavorful and flower-full recipes to make dinners in the days ahead, magical and rare:

MARIGOLD CHEESE BALLS

(Marigold--"the poor man's saffron")

8 slices white bread
 1 cup grated cheese
 ¼ cup butter
 1 garlic clove
 4 egg whites
 dash salt
 ¾ teaspoon baking powder
 2 teaspoons marigold petals

When marigolds are in full bloom, separate petals. Dry, then pulverize with spoon. Sift through flour sifter into glass jars. Tighten lid and store in warm dry place.

Trim crusts off bread slices. Cut into four squares or into fancy shapes with cookie cutters. Heat butter in skillet and saute garlic. When garlic turns deep gold, discard it. Saute bread on one side until a delicate brown. Drain on paper towel. Beat egg whites until they peak. Gradually add powdered petals, salt and baking powder and cheese, beating constantly. Spoon mixture onto unbrowned side of bread. Place beneath broiler until cheese turns light brown. Serve immediately.

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TUNA MARIGOLD CHEESE BALL

1 can of eight ounce tuna fish
Eight ounces of soft cream cheese
2 tablespoons of grated onions
1 tablespoons of lemon juice
Half a cup of chopped dried marigold petals
Dash of horseradish

Mix ingredients thoroughly. Then chill for two or three hours. Make into a ball and chill one hour before serving.

ROSE PETAL CAKE

1 cup rose petals, washed
3 cups flour
1 cup sugar
½ cup oleo
3 eggs
1 cup milk
2 teaspoons baking powder
1 lemon
½ teaspoon salt

Cream oleo and sugar thoroughly together. Add eggs well-beaten, and flour, baking powder, salt, milk, grated rind, one tablespoon lemon juice and fresh rose petals. Pour into greased and floured cake pans and bake in moderate oven from 25 to 30 minutes. □

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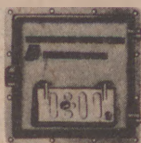
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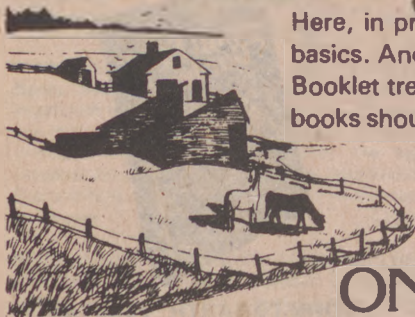
G-31 THE COMPLETE HOMESTEADING BOOK by David Robinson - A realistic look at homesteading's positive appeal as well as negative factors. Buying land, capital and investment needed, types of housing, gardening and livestock, water, sewage, heating, cash incomes, community relationships. Hard to find sources for supplies. 256 pp., illustrations and photos.
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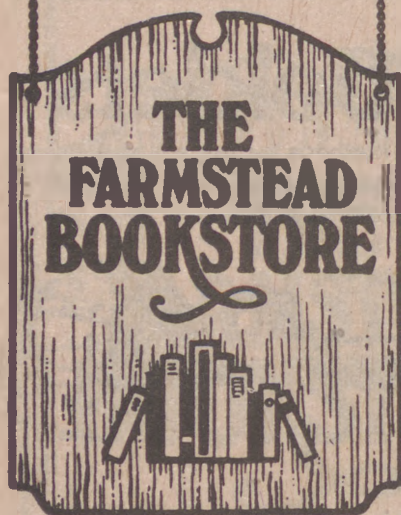
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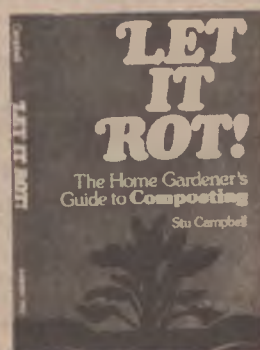
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R-53 THE SEED-STARTER'S HANDBOOK by Nancy Bubel - A practical guide to growing vegetables from homegrown seeds. The techniques are thoroughly explained and the basic botanical principles of germination, dormancy and light response are presented. Handsomely illustrated by Rob Shetterly. 384 pp., 44 photos, 150 illustrations.
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R-54 UNUSUAL VEGETABLES: SOMETHING NEW FOR THIS YEAR'S GARDEN edited by Anne M. Halpin - Contains all the information needed to grow 79 out-of-the-ordinary vegetables. A wide range is covered, including some from other parts of the world which can be grown in this country. Contains appendices listing seed suppliers, seasonal growing guides, charts, food values, and recipes. 464 pp., 72 illustrations.
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R-56 MANAGING YOUR PERSONAL FOOD SUPPLY edited by Ray Wolf - How to eat better for less by taking an active role in producing, processing and preparing your food. Explains how to incorporate homegrown products and outside purchases into a nutritious lifetime eating plan. 480 pp.
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G-27 THE SOYBEAN BOOK by Phyllis Hobson - This is the definitive book on soybeans. If you've read bits and pieces about soybeans, how packed with protein they are and the thousands of ways they can be used for tasty foods, here is the book to explain it all. 222 recipes plus ways to use soybeans to replace or extend meats. 160 pp., 50 illustrations.
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R-52 STOCKING UP: HOW TO PRESERVE THE FOODS YOU GROW, NATURALLY edited by Carol H. Stoner - One-third larger than the original edition, with many more illustrations and almost 100 new recipes, the new edition has expanded directions for jams and jellies with honey; for drying fruits, vegetables, and meats; and for making a variety of soft and hard cheeses. An excellent reference work on all aspects of preserving. 552 pp., illustrations.
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G-14 SECRETS OF COMPANION PLANTING FOR SUCCESSFUL GARDENING by L. Riotte - Companion planting is planting your garden around positive plant relationships. Ask any old-time gardener - IT REALLY WORKS! And Louise Riotte accurately tells everything about this fascinating, useful aspect of good gardening. • Plants that flourish together • Companions for pest and weed control • Soil building companions • Best fruit and berry pollination • Companion herbs. Complete alphabetical listings, charts, illustrations. 224pp.
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R-48 THE SOLAR GREENHOUSE BOOK edited by James C. McCullagh - This is the first comprehensive book dealing with design, construction and crop production in a variety of solar greenhouses. It provides detailed technical and design information, with emphasis on low-cost, low-energy structures. 344 pp., 136 photos, 135 illustrations.

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G-93 BUILD YOUR OWN LOW-COST HOME by Roger Hard - This book offers a viable alternative to expensive home construction; by describing in text and illustrations, the techniques used to build log homes either from "scratch" or using pre-cut log house kits. Over 100 detailed drawings, plus illustrative photographs take you step-by-step through the planning, site selection and preparation stages, the text always carrying parallel directions for kit construction or "from-the-tree" construction. 220 pp with 125 illustrations.

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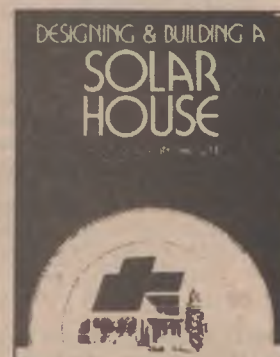
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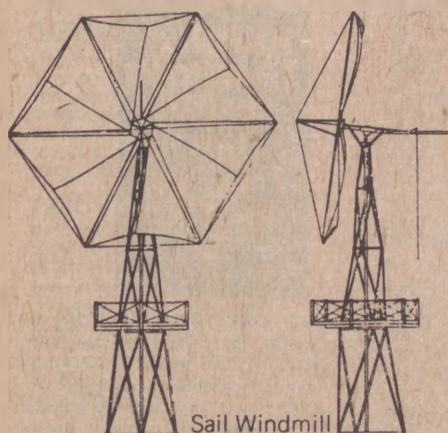
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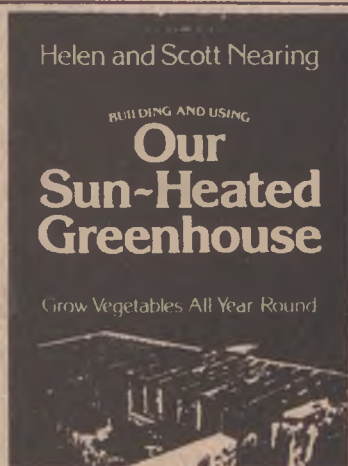
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Morel Mushrooms

By Clarice Moon

The morel mushroom is one of the most sought after and easily identified mushrooms that grows. Its cap is an elongated cone and is distinctly pitted like a sea sponge or an old piece of honeycomb. Its color ranges from cream to tan, varying from cinnamon to rust. The cap is joined as a continuous part of the stalk. The cap and stalk are hollow. Morels grow from 2 to 6 inches tall.

The morel mushroom season lasts for about a month and requires a near-perfect combination of temperature and moisture at the right season to produce a significant amount of mushrooms. They can be found in temperate climate areas in the United States. Look for them in old orchards or lightly wooded areas where old decayed trees or dead stumps are found. In Wisconsin they are usually found in the month of May.

Morels are a delight to the cook. They may be stuffed or fried in butter. If you find a lot of them, they can be dried by stringing them on a thread. When they are to be used, soak them in hot salted water for a time, and then use them as you would fresh morels. Morels should be washed well and placed in a pan of hot boiling water in which salt has been added ($\frac{1}{4}$ c. salt to 1 qt. water). Let stand for 5 minutes. Pour off water, drain well and pat dry with paper towels.

FRIED MOREL MUSHROOMS

2 c. morel mushrooms washed, blanched and split

4 T. butter

$\frac{1}{4}$ c. flour

Salt and pepper to taste

Wash and blanch mushrooms. Melt butter in iron skillet. Roll halves of mushrooms carefully in flour. Sprinkle salt and pepper on them lightly. Arrange in one layer in skillet. Cook over medium heat until golden brown and tender. Turn once to cook both sides. Serve hot. Serves 4.

MOREL MUSHROOMS BAKED IN CREAM

2 c. fresh morel mushrooms

Salt to your taste

1 c. heavy cream

2 T. Butter

Prepare mushrooms for cooking by washing, blanching and draining. Wipe dry. Preheat oven to 400 degrees. Place mushrooms in a shallow baking pan. Add salt to taste. Pour cream over mushrooms and dot with butter. Bake for 15 minutes and serve hot. Serves 4.

MOREL MUSHROOMS STUFFED WITH CHEESE

$\frac{1}{4}$ c. dry bread crumbs

$\frac{1}{4}$ t. dried basil

$\frac{1}{4}$ c. mozzarella cheese, grated

4 T. butter, melted

12 morel mushrooms washed, blanched and slit down one side

Preheat broiler. Mix bread crumbs, cheese and basil. Stuff mushrooms. Place mushrooms in a shallow baking dish with slit side up. Brush with butter. Broil for 5 to 6 min. Serves 4.

Clarice Moon is a frequent contributor to Farmstead and resides in Delavan, Wisconsin. Illustration by William Townsend.



Morel mushroom: *Morchella esculenta*

MOREL MUSHROOM OMELET

6 T. butter, divided

1 c. morel mushrooms cut in slices

1 t. lemon juice

Salt and pepper to your taste

8 eggs, beaten

Melt 3 tablespoons of butter in a heavy skillet over medium heat. Add mushrooms, lemon juice and seasonings. Cook for 2 or 3 minutes, stirring briskly. Set aside to cool slightly. Beat eggs lightly. Stir into cooked mushrooms and their juices. Heat butter in omelet pan or 12 inch skillet over high heat. Turn to coat pan with butter. Pour in egg and mushroom mixture. Stir rapidly with a fork. Then shake the pan back and forth. Cook until omelet is softly set on top. Fold omelet onto itself and turn onto warmed platter. Serves four folks. □

What are the five best ways to get an African violet to bloom?

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For instance there are a few simple steps you should take if your African violets refuse to blossom.

1. Check your plant carefully for pests or disease. Insects or rotting of any kind can weaken a plant and prevent it from flowering.
2. If the plant is free of pests, unpot it and inspect its roots. If there are more roots than soil, pot the plant in a larger container. If

the plant is in the right pot, remove some of the soil in its rootball and replace it with fresh medium.

(Try two parts African violet soil and one part perlite.)

3. Give the plant more light by moving it to an east or west window. Or put it eight inches below fluorescent tubes.

4. Fertilize every two or three weeks with half-strength flowering house plant fertilizer. Be sure the first number on the plant food's label is the lowest, such as 5-10-10.

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Long-handled scissors reach into the dense crown of an African violet to cut off faded flowers.

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OH-02

After another long, cold winter, New England is once again shedding her white coat and putting on her spring green. Now, many of the early wild flowers poke up through the still cool soil. I go up to my spring almost daily, watching for the first magical appearance of three early spring plants which every year at this time, surround my water supply.

The first plant is wild ginger. I transplanted it from a large patch down in the woods. It is a curious plant with two, deep green, heart-shaped and hairy leaves. The odd flower is half-concealed by its low position and the nearness to the ground. The blossom, growing at the junction of the two leaves, is a deep madder-purple. Wild ginger is a member of the small Birthwort family and is not related to the commercial variety, except in taste. The roots are brittle and grow just under the leaf mould, so it is easy to gather and dry.

Candied ginger roots were a favorite sweet with our New England ancestors. The roots were scrubbed, and a handful were put in a pot and just barely covered with water. Then they were boiled for about an hour or until tender. For each cup of ginger root water, a cup of sugar (usually maple sugar) was added and boiled for another 30 minutes. The syrup was bottled, the softened roots were left to dry for a few days, and then they were rolled in sugar before finally being stored in tight jars.

Before the advent of tractors, our forefathers had to cut their own hay by using a scythe. They threw the hay up in the barn with hay forks. This was hard work, especially during the hot days of July and August, so the farm women made "Switchel" or ginger water as a cooling drink. I make this often during the summer, and I have seen many different variations. However, the following is the one my family likes best:

SWITCHEL

¼ cup apple cider vinegar
1 cup honey
1 egg
A healthy pinch of ground wild ginger

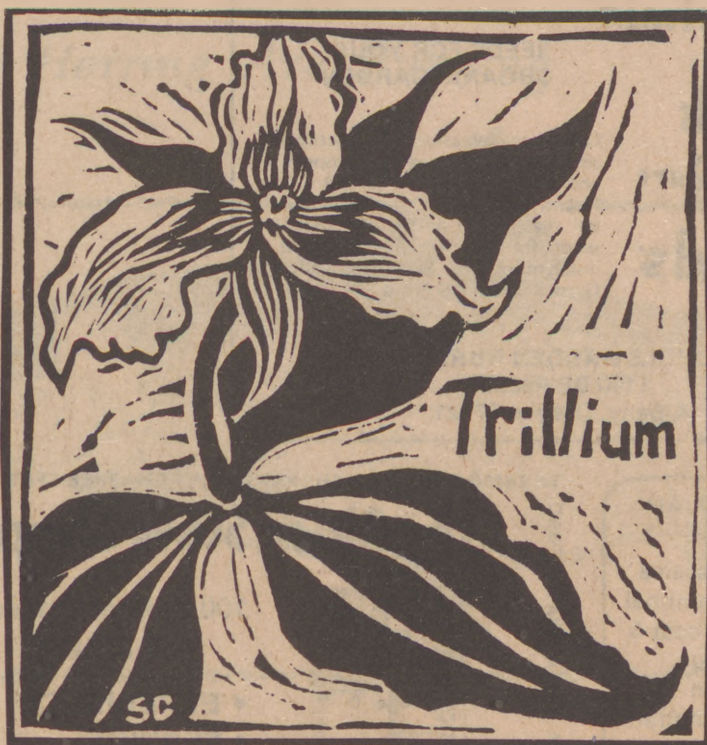
Mix the above in two quarts of cold water. Add ice cubes, if desired.

Judith Murray is an herbalist and lives in Starksboro, Vermont. Woodcuts by Siri Chandler.

Greeting Spring



Three Beautiful and Useful Flowers



spot down the road from my house. This is the painted trillium. It is smaller than most of the other trilliums with waxy-white petals, each marked with a deep crimson "V." The painted trillium blooms a little later than most of the other species, but usually not until late May.

These three plants I have described are not only beautiful to look at but the Indians and the early settlers used them for medicine. They should not now be used in place of qualified medical treatment, but the woods and fields were the only "drug store" in existence for the Indians and pioneers. The ginger syrup was used to help get rid of gas in the stomach, and the ground ginger root was used in place of mustard in poultices. The juice of the bloodroot was put on warts and ringworm, and some of the "old timers" still use it for that purpose. The ground root of the trillium was used by "granny women" in a tea to stop a spontaneous abortion. I had an occasion to use this tea, and the hemorrhaging did stop. The Indians also used it to stop diarrhea, but there are other plants better for this.

These are just three of the many useful and charming plants found in New England and around my spring. After the harsh winter, each flower is greeted with joy and gratitude, for gentler times have returned. □

Near the wild ginger is a small patch of bloodroot. As this plant breaks through the soil in late April or early May, the blue-olive green leaf is curled into a cylinder which protects the budding and fragile flower. Soon afterwards, the flower stem pushes itself above the leaf. The brilliant white flower has eight petals that expand flatly in the early morning, becomes erect by late afternoon, and closes in the early evening. This plant gets its name from the reddish-orange sap of the root when it is broken. Once I took a group of pre-school children from our local Head Start program on a field walk around the woods, and they were fascinated by the "plant that bleeds." This plant is a member of the poppy family. The only other member of this family in my area is celandine which has a small yellow flower and bright orange juice in the stems. Both of these plants were used as dye by the Indians.

Just after the bloodroot blooms(it dies back very quickly, leaving only the two leaves), I watch for the trilliums. This is one of my favorite plants, for I know spring is really here when they are in bloom. There are three of the white ones mixed in with the more common red ones beside the brook near the spring. The name comes from *Triplum*, (triple), because it has three leaves, three petals and three sepals. The sepals are the outer green covering that protects the

flower head. The leaves are ovate (egg-shaped) and pointed at the end. The stems are ruddy purple at the base. The rather long-stemmed flowers (except *T. sessile* which is stemless), droop and will nod in the wind, a phenomenon that has given rise to one of the different names for this plant: Nodding Wake-Robin. There are several species of Trilliums, but one of the most beautiful and rarest in this area grows in a swampy



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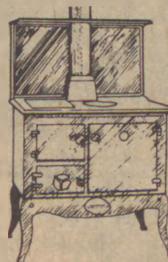
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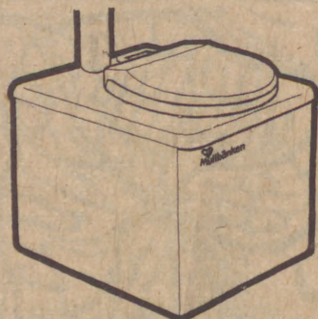
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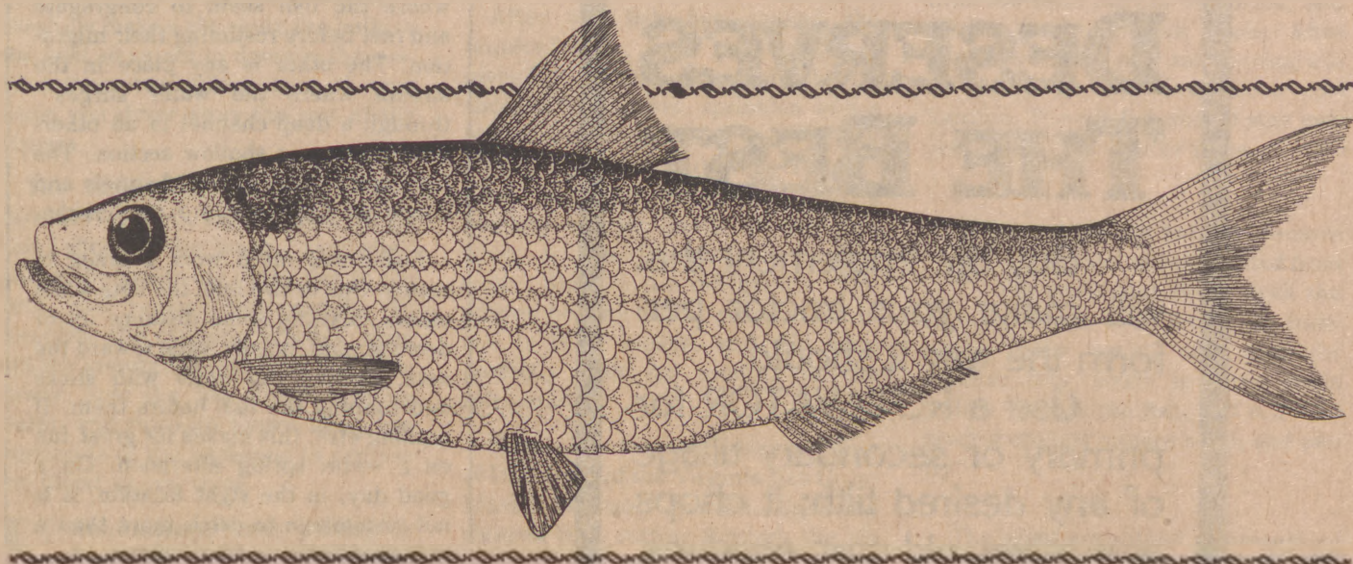
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The Herring Are Running



....The Herring Are Running

by Paul Fleisher

Every spring, up the tributaries of the Atlantic from Florida to Nova Scotia, they come by the millions to spawn. Silver flashes break the surface in a thousand fresh-water streams. Small groups of fish dart up the swiftly flowing waters with surprising speed, then circle and rest in a quiet backwater before dashing upstream again.

All along the Atlantic coast, the annual herring runs signal the coming of summer just as surely as the new growth on trees. Fisherman gather on the banks of creeks, wielding oversized dip nets to harvest the silvery fish. Although herring certainly can't be considered a sport fish, the runs provide a pleasant, sociable, productive way to spend an afternoon. Those of us who live near the streams where the herring spawn wouldn't miss this yearly opportunity for good fun and good eating.

The river herring, as they are known, are actually two different species with very similar appearances. The more common is *Alosa pseudoharengus*, which are known in places as the alewife. The other is *Alosa aestivalis*, or the blueback herring. Both species have dozens of

other common names, which vary from locality to locality. Distinguishing between the two species using external features is difficult; the only difference is that the alewife has a somewhat larger eye. Internally, they are easily distinguished. The peritoneum, or lining of the body cavity of the alewife is pinkish, while that of the blueback herring is black.

In both species, the females tend to be slightly larger than the males. Of course, in the spawning season, which comes in late spring, the males carry large whitish sacs of milt, and the females carry their golden treasure of roe.

River herring weigh about a half a pound. They have blue-green backs and silvery sides with large loose scales. Their tails are deeply forked, and their belly is roughened and serrated from gills to vent, giving rise to one of their many common names--sawbelly.

Like the salmon, the river herring is an anadromous fish, spending part of its life in fresh water, and part in salt. Spawned far up in fresh water streams, the young swim downstream to the Atlantic in late summer or fall. Those that survive the dangers of ocean life return to the fresh water to spawn in three or four years. Scientists do not yet know whether, like the salmon, river herring return to the

same stream where they were born to spawn, but they suspect that they at least return to the same general region.

Unlike the salmon, the herring don't die after spawning, but return to the sea, and may spawn several times in their adult lives. These toothless plankton-feeders depend for their survival on sheer numbers. They travel in huge schools during their tenure in the ocean, and make their spawning dashes in groups as well.

In the early days of our country, the river herring were an important food source, especially preserved with salt and used for sustenance during the difficult winter months. The damming of many coastal rivers and streams and heavy commercial fishing in earlier years, have reduced the herring population considerably from what it was in colonial days. But the fish are still quite abundant along most of our eastern coastline.

Commercial fisherman catch herring by the tons in fish pounds, traps and seines. For the amateur, the most common method by far for taking them, is dipping with an oversized, longhandled dip net. These nets are best outfitted with a mesh of chicken-wire rather than twine. This allows the net to remain open whether it is facing upstream or downstream.

Paul Fleisher lives in Richmond, Virginia. Alewife illustration by William Townsend.

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There are two prime locations for dipping in a stream where the herring are running. One is a deep hole, where the fish seem to congregate and rest before resuming their migration. The other is any place in the stream where the water surges through a deep channel in an otherwise narrow or shallow section. The fish tend to stay in the channels and deeps as they dart up the creeks.

Fisherman often work a creek in teams. One or two man the nets while others, starting some distance up or down stream, noisily wade toward the nets, beating the water with sticks and running the fish before them. If nothing else, this makes for great fun on a warm spring afternoon. On a good day, in the right location, it is not uncommon to catch more than a gallon of fish in a single dip.

There are other methods of taking herring. Given the right stream, it is possible to catch them in a seine, or even a cast net. Although herring will not take either live bait or most lures, they will sometimes hit a shad dart retrieved through the water in a series of short jerks. However, if the object is to catch a lot of fish, this method is both unreliable and highly inefficient.

One frequently sees people fishing for herring with snatch hooks, bare trebel hooks which are jerked through the water, snagging fish on their barbed points. This is a brutal, unsportsmanlike method of taking fish, which undoubtedly leaves many wounded fish in the water, torn but uncaught.

There are laws regulating the taking of herring in many places. For example, a special county license is required for dip-netting in my home state of Virginia. Any local sporting goods store should have the information you need to be a legal angler. They should also be able to tell you when to expect the herring to run. In Virginia, the heaviest runs begin around the end of April, and last for over a month, but the timing of the runs may vary further north or further south.

Once you've caught several bucketfuls of fish, you will be faced with what will appear to be a monumental cleaning task. It's not nearly as bad as it looks. Herring can be cleaned quickly and easily. The large, loose scales can be scraped off very rapidly, as long as the fish has been kept wet.

After that, the head should be cut off just behind the gills. The reproductive organs should then be easily visible in the body cavity. If the fish is a female, carefully make a slit along the belly to the vent so as not to damage the roe. Save these two golden sacs of eggs when you throw away the rest of the viscera.

The males can be cleaned less carefully. Simply lay the fish on its side, slice off the lower "sawbelly" part of the underside of the fish to the vent, and remove the entrails. To complete the cleaning process, strip out the membrane that lines the body cavity, hold the fish under running water, and run your thumb along the underside of the backbone to remove the blood as you rinse.

Unfortunately, fresh herring is barely edible. It's not that the meat doesn't taste good; in fact, it's delicious. But these little fish are laced with hundreds of tiny bones that make eating them extremely tedious. I do know a number of people who hold a different opinion; they pan fry their herring in butter, and tackle the arduous task of eating around the bones with the greatest pleasure.

Many people use herring as live bait to troll for bluefish and striped bass. I have even met one man in Rhode Island who follows the tradition taught to the Pilgrims by the Indians long ago. He drops one or two of these abundant little fish into each hill of corn when he plants, as fertilizer. Nevertheless, the best use for herring is eating.

Fresh herring roe is a delicacy that many people find superior to the coarser, expensive roe taken from the herring's close relative, the shad. Herring roe is easy to prepare. Simply saute it in butter. Or dip the sacs of roe in beaten egg, and then bread with salted and peppered flour or cracker crumbs. The breaded roe can then be either pan fried or deep fried. The roe cooks quickly, and should not be allowed to dry out with overcooking. Serve with lemon wedges, tartar sauce and crisp strips of bacon.

Salted or pickled, herring is a taste treat to be enjoyed months after the last fish has spawned and returned to the ocean. To pickle herring, thoroughly clean the fish as described earlier, and cut them across the backbone into steaks about one inch thick. Cover the steaks with a brine

made of two cups of salt per gallon of water, and refrigerate for two or three days. This brining firms up the flesh.

After the fish has soaked the required time, rinse thoroughly. In glass jars, alternate layers of fish with slices of fresh onion, sprinkled with a few peppercorns, mustard seeds, dill seeds, bay leaves and whole allspice. Cover the fish completely with a pickling solution made of one part white or wine vinegar to one part water. Store in the refrigerator. The pickled herring will be ready to eat in two to three weeks, and will keep perfectly well for months in the refrigerator.

Here's how to salt herring, courtesy of Dick Cook of the Virginia Sea Grant Marine Advisory Service. Split the cleaned fish, cutting through the rib cage on one side of the backbone. Wash the fish thoroughly. In a stone crock, wooden tub, or large glass container, lay down an inch of non-iodized salt. Then alternate layers of salt with single layers of fish, making sure that the salt covers each piece of fish completely on all sides. Leave another inch of salt at the top of the crock. Store in a cool, dark place.

After five days, check the crock. There should be brine at the top, from the liquids which the salt has drawn from the fish. Dip out the brine, and fill the crock with salt again. After about six weeks, your salt herring will be ready to eat. Keep in a cool location. The salt fish should stay well preserved for a year or more.

To prepare salt herring, remove the amount of fish needed from the crock and rinse. Soak the fish for about four hours in fresh water, rinse again, and soak for another four hours in more fresh water. To cook the fish, just roll it in cracker crumbs or corn meal, and pan fry.

The great advantage in preserving herring before it is eaten is that, especially when pickled, the bones become softened and almost unnoticeable. The preparations are not as difficult or time-consuming as they may sound, and in addition to the fun to be had in an afternoon spent catching these silvery fish, the end results of your efforts will be, in a word, delicious. □

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The Farmstead Reviewer

THE SPRAYSAVER APPLE CALENDAR. By Steve Page. Northwind Nursery: Washington, Maine, 1980 Supplement, \$2.50. Calendar and Supplement, \$7.00.

by Chris Winne

Plum curculio. Leaf scab. European Apple Sawfly. Codling Moth. If you grow apples, you will undoubtedly be familiar with these pests--if not with the names, then surely with their damage. The temptation is to run to the garden supply store to stock up on orchard spray. After all, wouldn't it be nice to have some fruit that looked just like that from the grocery store?

STOP! Before you do anything, get **The Spraysaver Apple Calendar**, by Steve Page. Organic purists may shun the calendar due to its advocacy of the occasional use of pesticides, but this publication will do more to reduce pesticide use than a dozen of the most ardent purists, and give us better apples besides.

Steve Page is an old hand in organic agriculture, having found his inspiration to farm from the biological agricultural movement and the poetry of Wendell Berry. When he decided to venture into commercial apple growing, however, Steve found it necessary to use poisons on his crops. Without them, the apples would simply not meet commercial standards. Knowing he did not wish to follow the standard practice of "spray spray, spray," Steve Page initially experimented with a minimal spray program of his own design with purchases from the farm store. Later, he incorporated the research of other folks, like the entomologists of the Nova Scotia Research Station in Kentville, Nova Scotia.

Mistakes were made. Pesticides killed the natural predators of his aphids and mites (neither of which is often a problem in organic orchards) and while spraying for the aphids, he

managed to kill his honeybees. Steve Page has done us all a favor by writing **The Spraysaver Apple Calendar** so that we can learn from his mistakes and research. It is nothing but a concise introductory guide on Integrated Pest Management for orchards.

Integrated Pest Management (IPM) is the latest buzz-word of agricultural specialists. The theory is simple. Unlike the conventional practice of following a set, predetermined spray schedule whether there is a problem or not, IPM technique follows a natural calendar based on the bloom stages of the tree itself, combined with ecological management and also monitoring of orchard pest populations. Pesticides are only used if and when pest populations reach harmful proportions. The emphasis is on natural controls such as insect trapping and orchard sanitation.

The Spraysaver teaches us the necessity of understanding the natural rhythms of the orchard along with the individual characteristics of each individual grove. It is packed with information on insect natural history, pesticides (and their safe use), and apple orchard ecology. Advice is offered to those on both sides of the spray spectrum. It will help reduce spray for heavy users of pesticides without any change in the quality of the crop. Organic growers will be aided in getting quality fruit without a large spray program.

Yes, even those who only eat apples will gain from this booklet. If more consumers only realized the problems of agriculture and what goes into the "perfect" fruit the marketplace offers and seems to demand, sprayed poisons would much sooner become a thing of the past.

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THE GARDEN WAY BREAD BOOK: A BAKER'S ALMANAC. By Ellen Foscue Johnson. Garden Way Publishing, \$8.95.

by Frances Silenzi

This is an attractive and nicely put together book. Pages and print are large, something that is readily appreciated when it is propped up on the kitchen counter. The introductory section which sets out to convince you that bread baking is easy, really does that—with clear directions and many helpful hints. It's good for the new baker, interesting for old hands (pardon that), and an effective review for the fallen away, "I-used-to-bake-bread-but," group.

The recipes themselves are presented in a month-to-month arrangement. You thumb through September, October and November expecting to find carrot and winter squash recipes, and you do, (although disappointingly, there is only one squash recipe). You also run across Holiday specialties such as Portuguese Easter Loaves and Greek Christmas Bread. But most recipes are appointed to their months by the author's sense of their poetic fitness—(Vermont Johnnycake Bread for May and Whole Wheat Egg Bread for January). Not all are, strictly speaking, bread recipes. Pancakes, biscuits, doughnuts, muffins and two varieties of crepes are included.

For the most part the recipes do seem to be workable. After all, in yeast breads the method is often more important than the ingredients. I did have trouble with a batter bread recipe in that the flour called for was much too much to make a batter bread, and I ended up with an ordinary loaf instead. But a little more attentiveness on my part could have avoided that. I really should not have dumped in all the flour at once since I have baked enough to know that the amount of flour in any bread recipe can vary. On the other hand, I thought so much of the carrot corn bread (September) that I've made it half a dozen times since first trying it. There is, however, one problem in the recipe in that it calls for light cream which in my area never seems to be available. When I substituted evaporated milk it came out wonderfully rich and moist. When I substituted medium cream and reduced the amount of butter it came out soupy and sticky.

Of course, this raises another problem. Somehow my purist heart finds the concept of using canned evaporated milk in homemade bread fresh out of the old woodstove, a bit tacky.

Which brings me to my one serious objection to the book. Most of the recipes call for the use of unbleached white flour, either for all or part of the flour. As easy as Johnson says bread baking can be, I don't feel it is that easy to justify such a severe nutritional compromise. I don't ask that every recipe be written for the unrelenting whole foods purist, but I do think there should be more than three entirely whole grain ones in what is, after all, called a bread book. In my opinion, many of the recipes really don't have to be "lightened" with white flour. And to my taste all quick breads (breads leavened with baking powder instead of yeast) are better if made with whole wheat pastry flour. This substitution is easy enough to do. I did it with the carrot corn bread and it came out unsurprisingly delicious.

On the more positive side, I liked the use of such things as rhubarb, potatoes, fresh corn and carrots in breads. However, with over one hundred and forty recipes in the book and with its emphasis on the seasonal nature of the recipes, I would have liked to have seen even more uses made of surplus garden produce. Surely there is something one can do with all those rutabagas and woody beets in the basement. (Actually, I do have my own final solution for the beets, called beegels or beet bagels; invented one day.)

I also liked the inclusion of the many foreign recipes: Russian Black Bread (where with so much rye flour used I found its one cup of white flour unobjectionable); Pooris (a fried Indian flat bread with yogurt incorporated into the dough itself); and North African Coriander Bread (intriguingly spiced not only with coriander but also with ginger, cloves and orange peel). In all, the **Garden Way Bread Book** does have a lot of good ideas and many of them do seem worth trying. Even if you choose not to use the recipes given but to incorporate some of the ingredients and combinations of ingredients into some of your own tried and true bread formulas, the book is well worth going through. It's also a good book to give to a friend who has stopped baking. I must confess it did get me going again.

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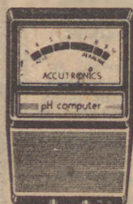
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Rashness is the usual precursor of failure, but progressive conservatism uniformly leads to success. Deep plowing is an excellent practice, but only when there is a soil to plow.

Flax--Sow on very mellow soil, free from weeds, one and a half bushels per acre, as evenly as possible. Select the heaviest seed, soak in warm water two or three hours before planting.

Horses--Feed according to the amount of labor required of them. Groom daily and thoroughly. Give air and sunlight in the stables, feed and water regularly, blanket only when exposed after labor.

Manure--It makes fast in compost heaps, if occasionally it is worked over with the addition of muck or any vegetable matter. Then, the quantity available for corn may be greatly increased.

Oxen--Feed grain if hard worked, and do not neglect carding regularly.

Plowing--This and any other working of the soil should never be done when the clods will not crumble. Dryness is essential to useful tillage. It is much better to delay work than to leave the land lumpy and hard.

Potatoes--At least a portion of the crop should be planted very early for security against the rot.

It's hoped that farmers do not neglect their gardens. The kitchen garden, if well-cultivated, brings tremendous rewards.

Cows and calves--If allowed to run together, it is usually best to put two calves upon one cow, and to have these of different ages, so that both shall not be removed at once when fit for veal. The calves should be fed gruel besides, and some veal raisers allow them free access to dry corn meal, or better, linseed-cake meal, and corn meal mixed.

Draining--This may be done in the spring--especially where there is a good fall, and work may progress from the outlet. The necessity for drainage is now obvious, and though partial drainage is never to be recommended where thorough work will be undertaken, yet it is often worthwhile to try the experiment just to see. Remember that the full effects of draining are often not witnessed until the third or fourth season.

Root Crops--Prepare the soil for sowing carrots, beets and mangels and onions, the earlier the better. It should be deep and rich, plowed in the fall and as free from weeds as possible, especially for onions which require the finest and mellowest soil, enriched with good fine compost. The other root crops need also rich soil, deeper than onion soil, but not less rich, though the enrichment need not be of so fine a quality. These crops cannot be sown too early, after danger for hard freezing is passed and the soil is warm and dry enough. Beet seed ought to be soaked 24 hours.

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Garden Guide

Sheep--Give ewes and lambs the attention they require at lambing time. The flock should have the personal supervision of the owner. Give, if possible, shelter of some sort, and at least keep the flock of ewes as near as possible to the house and closely watched. Distribute the lambs among the ewes having most milk, not necessarily leaving twins with their own dams.



Tillage--The preparation of the soil for the seed is the important work of this month. Manure is to be hauled and spread, and the ground is to be plowed. The waste of manure which occurs after it is spread is very little in weather which will not allow plowing, and not very great in full, hot sunshine, if it does not lie long. It is much worse to dump the manure in small heaps and leave it for some time exposed to the action of rains, for the goodness washes out into the soil and enriches it in spots, and can seriously damage the crop.

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MAY

May is the fickle month whose smiles are capricious, whose promises are frail. We usually have fine dry weather in April, which enables us to finish up a great deal of work and get ready for May planting. Nevertheless, we repeat our caution against planting too early the main crops of corn, beans and roots, except potatoes, for you will lose seed by its rotting in the ground. Sow all seeds when the ground is dry and warm, and not before.

Make provision for work to fill up all the "spare time" so that you'll not have any, except for rainy days when the ground is wet and cannot be worked.

Beef Cattle--They must not be allowed to fall away in the least, but their meal, if anything, should be increased. At first, let them have only an hour or two a day at grass, making no difference in their feed. Gradually increase the grass and decrease the meal.

Calves--They may be allowed to run as soon as they can get a "bite" of grass, and being fed regularly beside, they will improve fast on skim milk and a little meal.



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Energy Harvesters is a very special stove. It is super airtight, easily maintained, accurately controlled and extremely efficient. It will produce significant heat for more than 15 hours on one load. In addition to all these important features, Energy Harvesters is designed to meet today's needs. It has an honest-to-goodness size and shape that fits with any room or decor. The deeply cast sides and custom hand-fitted finishing give it the beauty of a fine piece of furniture.

This stove is cast entirely in our own foundry where we cast precision machine parts for many of the top companies in the country. So when we make stove castings we make them of the same high quality iron and to the same exacting standards. That's why Energy Harvesters is warranted indefinitely against any flaws in casting or workmanship.

For your safety you will be happy to know that Energy Harvesters is certified to have passed UL Specification 1482 at Energy Testing Labs., So. Portland, Me.

Find Out More

There's no way we can tell you all the many innovations of Energy Harvesters in this small space. We do have a big Energy Harvesters Information Packet with beautiful full-

color photographs, details on the innovations, verified performance data and additional valuable information on wood efficiency. We'll be happy to send it to you if you'll send \$1.00 to help cover handling and postage. If you don't think the information packet is worth it, we'll return your \$1.00.

ENERGY HARVESTERS CORP.



*'As a cast iron foundryman,
I want you to
find out more about
our stove. Send today!'*

ENERGY HARVESTERS CORP.

Box 19M, Rt. 12, Fitzwilliam, N.H. 03447
(603) 585-3300

Please send us your big Information Packet.
We're enclosing \$1. (Your \$1. back if not satisfied.)

Name _____
Address _____
City _____ State _____ Zip _____

Final Offer!

For Spring Planting

ORDER NOW AND SAVE UP TO 50%
ON THIS CHOICE NURSERY STOCK!



Sensational
"Color-Changing"
Variety

Reg. \$2.00

\$1.00 ea.

(3 for \$2.50)
(6 for \$4.50)

HYDRANGEA TREE

In midsummer, this breathtaking, "color-changing" Hydrangea Tree (Hyd. P.G.) is covered with masses of snow white flowers. In August, they turn a beautiful bluish pink and finally in the fall, to a royal purple. An excellent tree for specimen or ornamental planting. Especially nice in groups of three. Easy to grow. Fast growing. Choice 1½ — 3' nursery grown trees.

SPECIAL—

10

PLANTS
ONLY

\$1.95

25 plants \$ 3.95
50 plants \$ 6.95
100 plants \$11.95
200 plants \$20.95

GIANT QUINAULT, EVERBEARING STRAWBERRIES



BEARS
ALL
SEASON

The biggest most luscious-tasting strawberries you've ever tasted. Heavy-bearers, they grow big as tea cups! They're firm, deep red and a mouth-watering delight for deserts, preserves, freezing and eating fresh.

PLANT 4-Season
Beauty Now!

PERIWINKLE



25
for
\$1.98

50 sq. ft.
(50 for \$2.98 —
100 sq. ft.
(100 for \$4.98 —
200 sq. ft.
(Reg. 10 for \$1.00)

Shade-loving, wide-spreading Periwinkle (Vinca minor) thrives under hedges, on slopes, in rock gardens, in poor soil — places where grass won't grow. Dainty lavender-blue flowers in the spring. Green foliage all winter! One plant will fill two square feet. Nicely rooted, ready to transplant.

Hardy, Permanent
Neat



PRIVET HEDGE

10 FOR \$1.98

40 for \$ 7.00
60 for \$11.00
100 for \$17.50

Amur River North — most popular trimmed hedge in America. Can be maintained at any height, making a thick, dense hedge right down to the ground. The lustrous green leaves stay on till late fall. Lasts for generations. Requires practically no care. Plant 1½' apart for a beautiful living fence. You receive healthy 1' to 3' plants. Not shipped to Calif. or Ariz.

4 years old —
10-18" size

COLORADO BLUE SPRUCE

3 FOR \$1.95



Yes, now you can purchase the beautiful Colorado Blue Spruce (Picea pungens glauca) at amazingly low prices. Strong northern grown, nicely branched 4-year old, 10-18" seedlings that are nursery grown. Ideal transplanting size. Excellent for corner groups, windbreaks, or as individual specimens.

Masses of Color Early in the Spring!

CREeping PHLOX

You'll be amazed the way Creeping Phlox (P. subulata) which only grows about 4" tall, spreads and spreads to be more beautiful year after year! Best of all, it gives gorgeous color long before most spring flowers. Stays green all year — a wonderful ground cover or border. Thrives in partial shade or full sun. Strong field divisions, our choice of red, blue, white or pink.

at 1/2 price!

6 FOR \$1.00

(12 for \$1.75)
(18 for \$2.50)



COVER THOSE HARD-TO-FILL
BARE SPOTS WITH BLAZING COLOR!

Grows in any soil .Needs no special care.
Thrives in sun or partial shade.
Quick, even, disciplined spreading
Guaranteed .Inexpensive

CREeping RED 4 FOR \$1.00 SEDUM

8 for \$1.75 12 for \$2.50
24 for \$4.75 48 for \$9.25

You'll be thrilled with this hardy ground cover — Sedum spurium, sometimes called Dragon's Blood. Fills those ugly trouble spots with attractive, thick evergreen foliage all year and amazes you with brilliant, star-like flowers June thru Sept. You get hardy, northern, nursery-grown plants.

SEND NO MONEY. On delivery, pay postman for the items plus COD charges. On prepaid orders, please add 75¢ to help postage and handling. **FREE** planting instructions. All items clearly labeled.

Full Protection GUARANTEE

All stock guaranteed to be of high quality, and to arrive in good healthy condition, or purchase price will be refunded. Return shipping label only — you keep items. (1 yr. limit.)

CLIP THIS

HOUSE OF WESLEY, Nursery Division
Dept. 4985-25
Bloomington, Illinois 61701

Send items checked below: Prepaid ☐ COD ☐

HOW MANY	CAT. NO.	NAME OF ITEM	COST
	158	Blue Spruce	
	241	Creeping Phlox	
	242	Cr. Red Sedum	
	567	Strawberries	
	638	Periwinkle	
	675	Privet Hedge	
	854	Hydrangea Tree	

Postage and Handling .75

Illinois Residents add 5% Sales Tax

TOTAL AMOUNT \$

Name

Address

City

State

ZIP