Melons ripen on the vine as in the background a green manure crop of buckwheat replaces nitrogen that an early crop of peas took from the soil.

Feeding Ourselves In The North Country

by Doug Jones

EARLIER PLANTING FOR ABUNDANT HARVESTS
Part II in the Series

If you are determined to grow your own food, you can't afford to overlook the potential of special techniques for planting your vegetables early. Our cool climate presents an exciting challenge which must be faced. By comparison with more moderate parts of the country, our spring comes late, but when it does come, it's very brief. Summer rushes in and demands that we be prepared to take advantage of the good growing conditions. As shown in the first part of this series, our answer to this challenge can take two forms: more extensive use of cool-weather crops; and use of many possible techniques for extending the growing season and hastening the maturity of all of our vegetables, both hardy and tender.

This article will explore methods which allow us to start earlier. This can mean as much as a *50% increase* in fresh harvest season and total yield. If you find yourself waiting until mid-August to start eating some of your favorite vegetables; or if you don't plant your greens until June 1st, and end up picking a few bitter morsels while they bolt to seed; or if you are caught with a thousand green tomatoes at frost time—you can do much better. Read on. Experiment. Share your results with your friends.

I've divided these methods into four main categories, though there is much overlap. They include: 1) Soil preparation; 2) Starting plants in artificial environments; 3) Protection in the garden; 4) Succession crops.

I.
SOIL PREPARATION FOR EARLIER PLANTING

In the previous article in this series, I discussed the desirability of light (sandy) soils and south-facing slopes for early plantings, and ways to "lighten" a heavy soil with organic matter. But what about drainage problems? It's not always necessary to wring your hands and wait for that lake in your backyard to become a garden again.

A wet spot on level land may require a major ditching effort, including tile drains. The local Soil Conservation Service can advise and often help financially in such cases. But if your chosen spot for early planting is sloping or lies below a sloping area, there's a good chance you can work your own engineering wonders with a shovel and some rubber boots.

Often a well-placed ditch will earn you a patch of dry ground in no time—at the cost of an hour of playing in the mud with your shovel (one of my favorite spring rituals).

Study the flow of water in your garden and uphill from your garden; make test digs around wet spots to locate springs. The most effective ditch is one that diverts the water source before it reaches your garden, i.e., tapping into the spring at a higher elevation.

Once you locate the source of the seeping water, plan the route of your ditch, then start digging at the *lower* end of the route, so you can do most of your digging in drier ground. If you start at the water source, the water will be obscuring your work as you go, and mud is much harder to dig than dry soil.

Even snow on the garden in late March or early April shouldn't stop your early-planting enthusiasm. Scrape it off of a spot that you know to be well-drained, so the sun can strike the dark earth and thaw it out. A sheet of clear plastic over your newly-cleared spot will speed up the process due to the "greenhouse effect," also insulating the ground from further hard freezes.

One great way to warm up soil before planting is to pile it into *raised beds* as soon as it thaws out, usually around April 1st. The many advantages of growing in raised beds have made them very popular—greater yields, easier care, less soil-compaction, effective deepening of the topsoil, broadcast planting, etc. For starting an early garden, they have several added advantages: warming the soil, draining the soil, allowing easy placement of rich compost under heavy feeders, and providing the foundation for protective structures discussed in Part 3 of this article.

A hoe will work for piling the soil in long ridges 12" to 18" high, but I prefer a round-pointed shovel, for it moves more dirt, with greater overall use of the body in a nice rhythmic motion. Certain rototillers have attachments for making such beds, also. Rake the bed out smooth until it is 8" to 10" deep, 15" to 30" wide, and as long as you want. Unless the soil is quite heavy or wet, you should tamp down the beds with a hoe after planting to re-establish the capillary action which brings water to the surface from below.

Although we try to keep down our use of non-biodegradable plastics, we do find them to be extremely effective in certain uses. One such use is black plastic to mulch and warm the soil for early cukes, melons, peppers, and eggplants, and the earliest tomatoes. Melons seem to show the greatest response. On the other hand, you should avoid organic mulches before the ground has thoroughly warmed up, for they will keep the ground cold and slow plant growth.

II.
STARTING PLANTS IN ARTIFICIAL ENVIRONMENTS

SEEDLINGS

Certain vegetables are capable of being grown as seedlings indoors or in coldframes, hotbeds, nursery beds, etc., in order to get a head start of several weeks before the normal growing season for those vegetables. Vegetables most often started this way, with growth period before transplanting, are: spanish onions—12 weeks; peppers and eggplants—10 weeks; tomatoes—8 weeks; celery—10 weeks; earliest lettuce, broccoli, cabbage, cauliflower—5 weeks. For tomatoes, peppers, and eggplants, this usually means starting them densely in a flat in March, transplanting into larger spacing in April, and then into the garden in May.

The scope of this article does not allow me to cover the very detailed process of starting plants indoors—most gardening books do cover it. This method is *essential* in our climate, though, for all the above plants except the cabbage family. With sufficient heat, light, drainage, nutrients, and careful hardening-off, you can set out strong, healthy plants that will make optimum use of the hot summer months.

Lettuce and the cabbage family offer many options. For the earliest crop, start indoors about mid-March, and transplant with protection (see Part 3) to the garden during late April. Or, if your indoor space is limited, you can start them in a coldframe or other device in early April and transplant to the final spacing in early May. This will also help to harden the plants somewhat. Finally, by late April, you can sow without protection, either directly in the final rows, followed by thinning; or in a "nursery bed" sown thickly, from which they will be transplanted, as totally hardened, healthy plants, to their final spacing.

Direct-sowing in the rows may sound easy, but with the cabbage family, it will often mean more work, and carries more risk of total failure. This is because you have less control over the plants' environment: insects, weeds, and drought. A nursery bed measuring 2 ft. x 5 ft. will grow you hundreds of seedlings with minimal care, and allows you to choose the best plants for an even, strong stand.

Lettuce is different. You can direct-seed thickly (1") in final rows or beds, and use the thinnings in your early salads, which makes for a large harvest from a small space. Just keep thinning so that the leaves are just touching, and when the plants finally stand 10 to 12" apart, you can let the rest grow to maturity. For commercial lettuce plantings, where thinnings are not useful, transplanting is more efficient.

PRE-SPROUTING YOUR SEEDS

This technique came naturally to me, since I sprout alfalfa, mung bean, and other seeds for sale as food. (If you're not familiar with their valuable assets as tasty, nutritious winter salad vegetables, you should investigate sprouts and do your own "indoor gardening" with them.)

Pre-sprouting your garden seeds has two main purposes: getting certain vegetables off to an earlier start, and ensuring a more successful germination and more even stand of plants. For example: You're waiting for a cold, wet spell to end before planting your cukes or melons or squash, because you know they won't germinate in cold, soggy ground, and some seeds would probably rot. Besides, you're busy transplanting your cabbage family in order to take advantage of the ideal transplanting weather. Well, you could be sprouting those warmth-lovers while waiting; so when the next warm day comes, you stick the pre-sprouted seeds in, and three days later they're up!

Example No. 2: You're busy planting or weeding this and that vegetable, and just can't find the time to work up a patch for your beans, or to make up those hills for the cukes, but the weather is getting hot and time's a-wastin'. So you start sprouting those beans or cukes, and a few days later, when you have the time to prepare the ground, you can put in the sprouts, tiny plants that are already several days old.

Example No. 3: You never seem to get around to thinning out your cukes or your corn, or you find it hard to make all those decisions on which plants are weaker and should come out. Sprouting seeds helps you to see which seeds are stronger so you can space the stronger ones evenly in the hills and tows, and reduce your thinning chores. (Practical only with larger seeds.)

Example No. 4: You can't seem to keep your newly planted rows of carrots or parsley or beets watered enough during dry spells to carry them through their two or three week germination periods at shallow planting depths. But if you plant them pre-sprouted, their roots will quickly plunge to moister levels and help them survive. (It still helps to keep the beds moist.) Pre-sprouting is also a form of germination test, allowing you to calculate the viability of old seeds left over from previous years, so that you won't have gaps in your rows.

Now for the *method* and the special *precautions:* My main method is to put the seeds in a jar, which is at least four times their dry volume, cover the mouth of the jar with a cloth held in place with a rubber band, fill jar with water three times as deep as the seeds, let seeds swell up for twelve hours, cump off water, and then rinse by filling and *draining as completely as possible.* Rinse and drain again twice a day. Beets and beans should be rinsed three to four times a day.

Keep these jars of sprouts in a closed cardboard box in a spot where you will be sure to see them, morning and night, so you won't forget to rinse. Lay jars on their side for best air circulation around seeds. *Important:* When the majority of the seeds begin to sprout, you must either plant them or refrigerate them. The root of most seeds is very fragile if allowed to grow more than 1/2 inch long, and breakage of the root tip will kill or stunt your sprout. Well-rinsed, healthy sprouts will keep a week or more in the refrigerator.

Alternate method for small amounts of seed: Keep seeds between layers of wet cloth or paper towels in a closed container with slight ventilation. Check for sprouting after a few days. No rinsing needed.

Pre-sprouting is most advantageous with larger, easy-to-handle seeds like corn, peas, beans, squash, and cucumbers, but the following smaller seeds will benefit from a *partial* sprouting: beets, asparagus, carrots, parsley, spinach and onions. By "partial," I mean: follow the above procedure until just a few seeds start sprouting, then plant, so that most of the fragile roots don't emerge until the seed is securely tucked away in the ground.

Problem: These small seeds will stick together and resist even distribution in the row.

Remedy: Drain well, place seeds in a shallow dish, then skim some totally dry, powdery soil off the ground, and keep adding bits of dry soil to seeds and stirring them until they all separate into individual seeds wrapped in a cake of dirt. Now, plant these little dirt balls.

III.
PROTECTION IN THE GARDEN

Here's where the fun really begins. The possibilities for experimenting with early, protected plantings are endless. Many of the devices I will discuss here are actually variations of the *greenhouse idea:* a structure that allows light to enter—where it can be transformed into plant energy through photosynthesis, or into heat energy through absorption by plants and soil—and then slows the escape of that heat energy. Trapping this heat protects tender plants from deadly frost, and also keeps the trapped air closer to ideal growing temperatures. The humidity is kept very high, and plants are protected from drying or chilling winds.

Use of such mini-greenhouses directly in the garden or field has long been common in Europe, where large fields are often covered with long, tunnel-like, temporary plastic "greenhouses." The small, one-row variation of this is known as the *cloche* (see Fig. 1). An expensive version of the cloche is available in some U.S. seed catalogs, but designing your own is easy and cheap, and allows for more versatility.

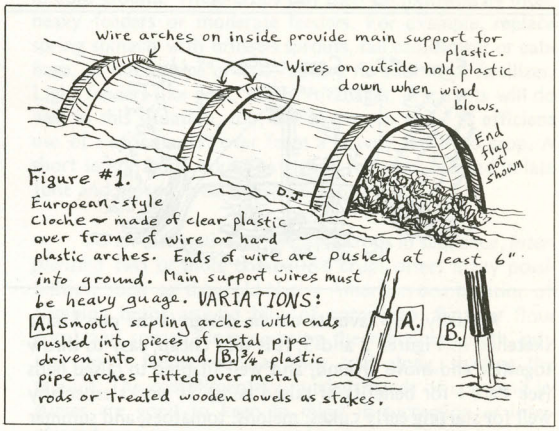
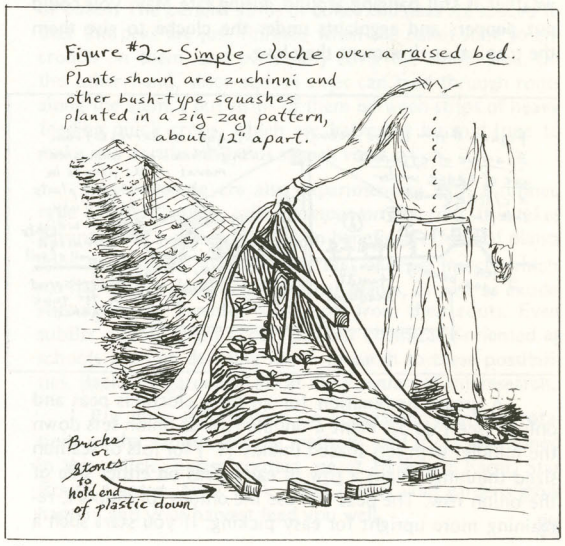


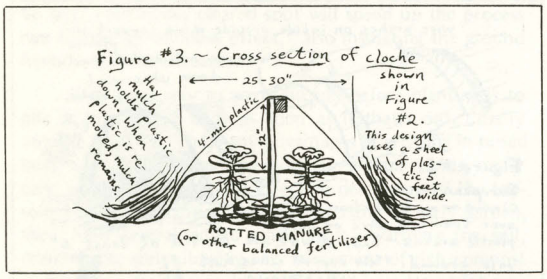
Figure #1.
European-style cloche — made of clear plastic over frame of wire or hard plastic arches. Ends of wire are pushed at least 6" into ground. Main support wires must be heavy guage. VARIATIONS: [A.] Smooth sapling arches with ends pushed into pieces of metal pipe driven into ground. [B.] ¾" plastic pipe arches fitted over metal rods or treated wooden dowels as stakes.

It is important to make your device easy to open and close for weeding, thinning, and watering. End flaps should also open for frequent adjustment of amount of ventilation. *Warning:* On sunny days, temperatures can easily rise above 120° F. under a tight cloche. This will damage or kill most plants. By mid-morning, you should fold back the plastic on both ends for ventilation. Vary the size of the openings according to outside temperature and intensity of sunlight. Close it completely only when frost threatens.



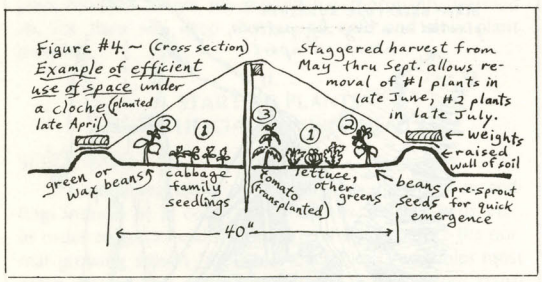
Since most 4-mil clear plastic comes in rolls 10 feet wide, I cut the sheet in half and adapt my cloches to take plastic sheets which are 5 feet wide and anywhere from 10 to 25 feet long. Or you can build two parallel cloches close together and stretch a full 10 foot sheet over both, with weights in between to hold it to the ground.

Instead of outside wires to hold the plastic down (See Fig. 1), I prefer to use boards or stones along the borders around the cloche, though this means leaving an extra 8 inches of plastic border on both sides. If you can afford it, or find it cheap, an excellent cloche can be made from steel mesh made for concrete reinforcement. It comes in 5 foot wide rolls with 6 inch squares. Being rolled, it has a built-in strong "arch" shape. Be sure to file smooth any sharp ends to avoid tearing your plastic covering.



Actually, my favorite cloche design is the one I have sketched in Figures 2 and 3. It is very cheap, easy to throw together and move around, and well adapted to raised beds (see Part I for benefits of raised beds). It works especially well for starting early cukes, melons, tomatoes, and summer squash. This peak-roof plastic tent is simply a low railing with a sheet of plastic over it. A good size for the horizontal piece is 2" x 2". For easier opening and closing, you could substitute boards or rocks to hold down one side.

You can use your movable cloche two or three times in one spring season. For example, you could place it over a bed of lettuce, radishes, peas, etc. about April 1st. After they get a good start (3-4 weeks) move the cloche to a bed of warm-weather vegetables like cukes or squash. If cool weather is still hanging around during late May, you could put peppers and eggplants under the cloche to give them the tropical environment they love.



A great combination for an early cloche is peas and onions (see Fig. 5). Plant a double row of onion sets down the middle, with sets spaced thickly (1") for lots of scallion sized thinnings. Plant a row of early peas on either side of the onion row. The peas will use the onions for support, remaining more upright for easy picking. If you start such a bed April 1st, you'll have scallions by April 25 and peas by June 5th!

The wooden-railing cloche provides a special service for tomatoes, because the railing can function as a trellis later in the season. Use lath pieces to train tomatoes to the top of the railing, then let them droop over the other side. This keeps most of the fruits off the ground. Large-vined varieties like cherry tomatoes benefit especially from this treatment.

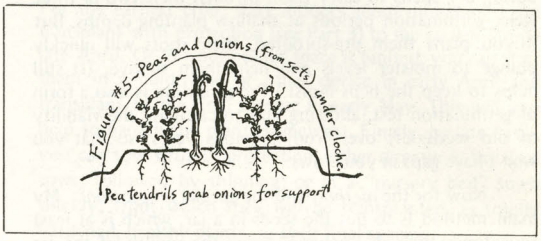


Figure 4 illustrates a way to efficiently use the space under a cloche for a succession of vegetables. They are all planted at the same time, say late April, but mature at different times. First the lettuce or other quick greens are harvested, during May and June, just in time to make room for the beans and tomatoes. The cloche, of course, would be removed in late May when frost danger is past, as the beans are "hitting the ceiling." (If tomatoes are the sprawling type, they should be staked to the railing.)

The beans will be picked during the month of July, and when production slows down, the plants are pulled to leave room for the tomatoes to expand to their heart's content. Incidentally, your early varieties will bear by July 20 with cloche protection to start them off. That leaves two full months of tomato picking before frost. Say good-bye to those green-tomato blues!

In general, a cloche alone will bring most vegetables to maturity about 2-3 weeks earlier than you could otherwise get them. Combined with pre-sprouting, black plastic mulch, indoor seedling culture, etc., you can do even better. By the end of April you can eat fresh salads of lettuce and beet thinnings, radishes, green onions, and wintered-over spinach. Peas and carrot thinnings come a month later. Lettuce and other greens are perhaps the most intensive crops you can grow under a cloche, in terms of the money you can save by not buying expensive spring salad ingredients. This is because you can plant densely and use the thinnings. One early bed, 2 feet by 10 feet, planted with three rows, will yield about $25 worth of lettuce at May prices.

The standard *cold frame*, made of boards and old windows, or clear plastic, though usually used for starting seedlings, can also be moved into the garden and used as a cloche, or you can build permanent cloches using the standard cold frame design, which can be picked up and moved from bed to bed in the garden as the spring progresses. Most gardening books give basic designs for cold frames.

On the other hand, the simple throw-together cloche designs which I have described can double as seedling starters. In fact, I often sow rows of broccoli, cauliflower, early cabbage, and headlettuce in between rows of leaf lettuce or peas under a cloche. The seedlings are dug out for transplanting just as the lettuce starts to crowd them out. I

sometimes harden-off flats of tomatoes or peppers by putting them in vacant spots under a squash-cloche.

Warning: Just as your early vegetables will thrive under a cloche, so will the weeds. This is why I've stressed the importance of being able to open your cloche easily. Also, on warm, rainy days, you can leave the cloche wide open to bathe your plants and lessen the need to water them. And you should start leaving the cloche open for extended periods a few days before you remove it entirely. This will adapt your plants to the "real" world, after their comfortable life in a humid, windless, artificial environment.

"Hotkaps" are small versions of the cloche, designed to protect individual plants like tomatoes or groups of young vine-type plants. The waxpaper type (Figure 6A) is available through some seed catalogs for 10-15 cents each, depending on size, and can be used two or three times if you are careful with them. While protecting from light frost, they don't produce the greenhouse effect the way the glass jug hotkap does (Fig. 6B).

To make these, dip a piece of cotton string in kerosene, and tie it loosely around the curved "corner" at the bottom of an inverted gallon or half-gallon jug. Ignite the string, and when it stops burning, quickly turn the jug over and dip it in cold water. The bottom will fall off, usually quite evenly, but you may need to smooth the edge with a file. Be careful—the excellent little greenhouse you have made will be quite fragile. Leave the cap off the jug for ventilation, except on frosty nights.

Plastic-jug hotkaps are easy to make with a sharp knife, but don't admit as much light. Hotkaps made from folded newspapers will also work as temporary plant protectors for a few days after transplanting, but admit no light. You can make small, translucent, somewhat water-resistant hotkaps from coated freezer paper, by folding and stapling into a small tent. They work fine for cabbage family transplants in cold weather.

IV.
....AND A WORD ABOUT SUCCESSION CROPS

Planting early is probably the best way to make better use of your garden space. Another way is to avoid leaving patches of garden bare during the summer. Well-timed *succession plantings* will not only increase your yields, but also protect your soil from leaching of nutrients by rain and oxidation of organic matter during hot weather.

If no vegetable seems to fit into your needs or plans for a particular spot, a *green manure* crop should be planted to keep something growing (see my article in Spring '78 issue of *Rootdrinker*). Buckwheat is the most versatile plant for the job, with its quick germination, rapid, weed-smothering growth, and ease of planting. Rye or a hardy legume should be used for a winter cover crop.

To figure your succession sequence, you will have to make a list of all the vegetables you like to eat, with information about each, like number of weeks to maturity, garden space required, how early or late they can be planted, and richness of soil required. Use the table included with my article in the Winter *Rootdrinker* to help you. Use July 15 as an approximate midpoint for the growing season, with April 15 and October 15 as endpoints for most cool weather crops (a six-month season), and May 15 and September 15 as endpoints for the tender ones (four months).

Since many cool weather crops can mature in two to three months, it is obvious that they offer the most possibilities for multiple crops in one season. This includes spinach, lettuce, peas, turnips, beets, chard, and other greens. Vegetables that take a little more than half a season, such as carrots or broccoli (including a full crop of side shoots) will have to follow or precede a very short crop like lettuce or spinach, or a green manure crop like rye or sweetclover. Both carrots and a good "sprouting" variety of broccoli will also do well when grown for a full season.

I often use nutrient needs as a main criterion in deciding what should follow what. I use a lot of manure on a spring crop of spinach or lettuce, or a fall crop of spinach intended for overwintering, both because they are heavy feeders, and because nitrogen becomes available very slowly in cold ground. These crops can then be followed by more heavy feeders or moderate feeders. For example, replace spring spinach with brussels sprouts, fall cauliflower or cabbage, or fall lettuce or kale, adding no additional fertilizer. Light feeders like peas, beans, rutabagas, or carrots will do well in this situation, too, but might not make as efficient use of nutrients left over from a heavily fertilized crop. A short season corn would be a good follower, planted in late June and picked in early September.

As an alternative to planting crops in sequence, *interplanting* two or more compatible crops offers many possibilities, such as the old Native American combination of climbing beans around hills of corn (pop, flint, or flour corn) and squash vines covering the remaining earth, putting down feeder roots as they trail along, shading the ground. The complimentary nutrient needs of corn and legumes are good to keep in mind in succession or interplanted crops.

Since most warmth-loving crops require a full growing season, we have to look to interplanting for efficient ways to use them. I've found the vine crops work wonderfully this way, namely cukes and melons with peas, and winter squash with spinach or lettuce. How and why?

Well, cukes and melons derive all their nutrients from the spot where they first came out of the ground, with no feeder roots along the vine. So I alternate long raised beds of cukes. The parallel strips of cukes and peas are spaced so that the peas are just finished when the cukes start to encrouch on them, and eventually cover the whole area. On the other hand, since squash vines can feed through roots along the stem, I put strips of them between strips of heavy feeding quick crops, which are harvested by mid-June to make way for the ravenous squash vines.

Many people are also experimenting with a refined type of interplanting, called *companion planting.* This takes advantage of supposed or proven beneficial effects of plants upon each other. Plants can attract or repel insects which are harmful or beneficial to other plants, as well as exude stimulating or harmful substances from their roots. Even subtler effects might occur, but our chemically-oriented ag schools are not devoting much research to these possibilities. Backyard gardeners are at the vanguard of this research.

For more information on companion planting, rotations or the various devices, methods, and tricks mentioned in this article, please contact me at Birdsfoot Farm, Star Route, Canton, New York 13617. May your gardens grow happily and your harvest feed you well. **R**