

Broccoli Production in Rhode Island

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An old farmer once told me the way to make money in farming was to critically assess the soils, water and climatic conditions of where you are going to farm and then take advantage of them. He said, “figure out what the climate is telling you to grow and let it help you”. We farm on a peninsula sticking out into Narragansett Bay, and our house is less than a mile from the ocean. It took me a while to understand it, but I now get the huge advantage the heat sink of Narragansett Bay plays on the success or failure of our growing practices. Needless to say, with the effect of global warming firmly in place, we have added 30 harvestable days to what we had back in 1980 when we started farming. Last December 27, 2012, we harvested 32 bushels of beautiful first cut broccoli without the use of any reemay covers!

Conversely, on the other side of the season, our land is very late in warming up. We go from mild late winter weather to a sudden burst of warmth that is a shock to us and as well to our plants. Thus, after many years of trying, we no longer grow spring broccoli or cauliflower. Too often it bolts or has any number of other problems just before we want to cut it. Our first harvest goal for any broccoli is August 30th. Depending on my longer-term estimate about the heat index of the summer, we will attempt some mid-summer cauliflower production. But more often than I want to remember, we will try growing broccoli only to have it get some heat damage during a very hot summer afternoon. Ruth Hazzard has written extensively about this; it only takes five hours of above 97 degrees to mess up an adolescent broccoli rosette. There is a critical couple of days when the broccoli plant is shifting from a vegetative to a reproductive state. If the newly formed rosette gets heat damage you will get deformed heads when it comes to harvest time. The day the damage is done you can't even see it but it is there and it can have a critical impact on your final harvest quality and profit. In California's' northern high mountain broccoli production areas, they are so tuned into to the heat damage possibilities, they will harrow in an entire crop if they are sure the daily heat index maximum is reached. This is why we grow four acres of broccoli, cauliflower and various kales but just for our fall markets.

Our first step is field preparation. We often will have to make a decision on how to manage the winter cover crop in May. If it is a healthy annual rye, we will plow it down at 24 inches and put an oat/field pea cover crop on afterwards. Depending on when we plant a particular field, we may have to turn in the pea/oat cover in a bit early to avoid oats from setting seed and becoming weeds. If this is the case, we will try and sneak in a bare fallow period to lessen the surface weed bank before the main crop. Our Lely tine cultivator is used in combination with a Canadian “S” tine wheat weeder. The latter is very effective for stirring the soil a bit more aggressively than the Lely especially after a heavy rain. But our operative goal is

to not disturb the soil any deeper than 1-2". Goal #1: Get soil ready while reducing the surface weed bank.

Our next focus is seedling management. We use "98 deep" plug trays from Landmark. Our soil is Vermont Compost Co "Forte Lite", which we cut 30% with straight peat moss. We do this because we like our plugs healthy but not too green. If too succulent, they seem more susceptible to flea beetle predation.

Other plug protocols:

- a) When second true leaf is fully open; fertilizer is reduced and they are moved outside for wind, rain and cool nights to harden them off and stiffen them up.
- b) At four true leaves (20 days) watch root mass to be sure it is not getting too tight; if so transplant within five days.
- c) Day of transplanting, spray with Dipel / Kaolin Clay/ Pyganic/ mix to ward off first flea beetles and other predators. Dip whole trays into seaweed and chelated phosphorus starter charge mix before leaving farm.

Field Prep: dealing with flea beetles has become a high priority, in fact so much so, it dominates even our fertility management. We are also in no hurry to feed weeds either. So we shoot for only 60 lbs of N. at the day of transplanting. Our main organic fertilizer source is Krehers 4,3,3. which is what we use to achieve all our broccoli fertility goals. Being organic means we will be cultivating our fields a minimum of five trips; this leaves us ample opportunity to side-dress our plants once or twice to achieve our total of 145lbs of N for the final grow out. Boron has become a big factor in our production the last four years. Carefully testing every year to be sure we keep to our goals, we are now believers in its efficacy. Especially, if the fields next crop is another lover of boron like beets or Celeriac. We apply boron with our boom-sprayer to insure even application and always try to do it just before the last smooth harrowing. To err on the side of caution, we never add more than a 2 lbs. of an active ingredient to any field in any calendar year without another soil test to make sure it is needed.

Transplanting: We use a water wheel transplanter. It is a muddy dirty job but there is no substitute for a well watered-in plug. If the plug is at its peak maturity, it is put in with ample water, and the soil is slightly dry 'outside' the wet plug site, we can let the plugs sit two days before we go over them with a blind cultivation fine tine weeder like our Lely. If the gods are with us, not one of them will pop out! Getting to this moment in the life of our Brassica crops is everything! If the plug is too mature the roots will go in circles and not expand out to anchor themselves. If they are too immature, they will just take too long to, again, anchor themselves. The first five days of weed control in the field sets the measure of profitability for all our brassica crops! If we miss our goal it can cost us hundreds of dollars in labor keeping everything weed free.

Cultivation: We blind cultivate (or fine tine cultivate) up to three times, every three days if possible. Next trip utilizes our "two-row Regii Power Weeder". This slightly hills the soil towards the center of the plug line while power ripping out any weeds that the Lely tines may have missed. Third cultivation is with our J.D. 900HC, a single row narrow tractor that can

cultivate a single row on our 36" center broccoli rows. It also has the best side-dressing unit on our farm and feeds both sides of the plant. Fourth cultivation is with our Ford 1710, which straddles the two rows and does under-cutting while drying the soil for the last run through. If everything comes together, we can spend as little as one hour having a crew of three employees hoeing an acre of broccoli.

Spacing: We use 36" between plants but 38-40" between paired rows. We like the extra room to make our differing cultivating systems work. It also helps the broccoli leaves find better light. This year we are using 15" in the row. Next year we will be experimenting with 12" in the row with certain varieties like Arcadia and Gypsy. California gets it down to 9" in the row but they are growing proprietary crown production cultivars not readily available or desirable to East Coast growers.

New Ideas: In an attempt to increase our profitability with broccoli, we are experimenting with a protocol where we first take a shallow crown off the top of the plant. At the same instant, (with our harvest knife) we will cut the next four top leaves halfway back toward the central stalk. We are finding the next four leave sites provide excellent large side shoots! Our retail goal is to get our plant profits up to \$6.50 a plant! That is twice the profit of our previous years of over zealous "chop and drop" harvest techniques, which was a reaction to the chain stores demand for banded three-stalk production.

A second idea is to get familiar with growing 'Chinese broccoli'; i.e., Johnny's "Happy Rich" and Snow Seed's "Guy Long". Similarly these plants are grown to that tipping point where they are shifting from vegetative to reproductive growth. If one cuts the top growing point, (at the first sign of floret development) one stimulates side shoot production down below. If your fertility, water and growing temperature are just right you can get an endless supply of broccoli florets that are amazingly tender. This is particularly well suited to mild cool fall production and winter greenhouse production. There seems to be a clear preference of these plants to grow in protected (wind free) environments, which is why we have had our best success with growing these type cultivars in our winter greens houses. Paul and Sandy Arnold start their seeds in January. Plant the plugs in February and harvest the side-shoots for the next seven months!