

Growing for Retail markets in S. New England with Field, Low Tunnel and High Tunnel Production

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Successful winter greens production requires a fundamental shift in the context from being a traditional summer grower. As an apprentice to winter growing, you will be learning to work with the dramatic changes in the sun's energy and the vicissitudes of temperature both above the ground and in the ground. We have all heard that the Eskimos have 32 words for the word 'snow'. Similarly, as a winter grower, you must no longer look at 'winter' as the grey cold period after thanksgiving to sometime in March when the crocus' show up. Like the Eskimo, you have to learn the language and dynamics that are involved with this season so you can take advantage of them; instead of them limiting your ability to produce delectable greens.

Many farmers' interest in Winter Greens developed from their observation that, at winter farmers markets, it is the farm stands that have the fresh greens that do a land's share of the business. It is now clear that one will sell a lot more onions and potatoes if your display is punctuated with vibrant greens of all kinds. What is needed is a plan for "seamless" production of greens from early October till the end of April. This will be achieved by starting your season outside in your regular fields; then about Dec 10th moving your production inside your greenhouses or high tunnels; and then finishing your season back out in the fields with plants you put in the ground back in late fall.

The most challenging phase of winter greens production is getting ready for and managing the "deep winter" or what has been labeled by many growers the "Persephone Period". It is the period from Dec 10th to February 28th; a period when, due to the lack of the sun's energy, low temperatures and a high incidence of disease; most greens production in the greenhouse slows to a crawl. When Persephone is forced to return to Hades for her winter stint (see your Greek Mythology book), everything in nature seems to either die or go into a state of suspended animation. The way through this period is to use your greenhouses as a 'savings bank' from which you weekly withdraw your carefully grow greens, which you have been planting as succession since late September through the middle of October. If you have worked out the numbers and gotten your successions just right, by the time you are withdrawing your last greens, your first greens should be able to start cutting once more. And in two weeks time, by the Middle of March, you will be amazed at the rapid regrowth that is ushered in by the increase in the sun's energy and commensurate increase in air and soil temperatures.

The second most important point to prepare for your "seamless greens" production is to keep outside production going for as long as possible; (till December 10th) while at the same time planting and differentiating your seedings to make your 'early spring production' as flawless as your 'fall to deep winter production'. At Wishing Stone Farm, late spring greenhouse tomato production is a very important part of our crop profile. As a result, we must transition out of our greenhouse greens production in March and early April to make way for our spring tomato crop. This is why it is so important for us to have field produced greens so well organized that we are only using our greenhouses for winter greens from October to March. We achieve this bi-

seasonal production by consciously working on the field production for the (March to May) period at the same time we are working on the (September to December) season production. In simple terms, we plant tight 'in row' plantings for the early winter greens and at the same time, we will plant more open seedings for late winter (March to May) production. For example: on October 5th we will plant a five row bed with "Blue Vates" (*B. oleracea*) at a rate of 24 seeds per foot and then (the same day) move to our (March to May) field and plant the same "Blue Vates" at a much thinner seeding of 12 seeds per foot. We repeat this process for a number of other greens. In the (March to May) harvest period we want larger more traditional size bunches, which necessitates giving the plants more space for soil, sun and nutrients. Versus, the (September to December) harvest we are more interested in weight and volume and therefore want to rapidly cut bunches that produce 20-28 stems with adolescent leaves at the top. Another production technique we start in mid fall for Spring harvest is Kale black plastic production. For this we use greenhouse grow plugs and plant them in October and let them mature. When the nighttime temperatures are starting to drop into the low twenties, we will cover these plastic rows with 1/2" electric conduit hoops bent with the Johnny's low tunnel hoop bender. We customized these to make them taller than wider feeling that the extra height helps with light and air quality, which assists with rapid growth in the spring. Our goal is for the black plastic production kale to have reached a good level of maturity, before we cover them up to go through the 'Persephone Period'. A plant with good root growth and substantial top leaf development will be able to better capitalize on the late winter sun and produce much better than a plant that is immature.

Getting back to the "deep winter" or Persephone Period of our production, we find it imperative to have replacement Greenhouse grown plugs on hand to replace greens that are on their second cut or are a once cut item. For example any lettuce cut during this period is taken out and immediately replaced with bok Choi, Spinach, Red Mustard, Yukina Savoy, Siberian Kale, etc.... Since the plugs are three weeks to a month old they are much more likely to get a good start and be producing more greens usually within a month. If we 'direct seed' during this period, we again open up the 'in row' seed rate so the seeds that come up have more access to light. Our deep winter direct seeding list is quite short. It consists of: Arugula, Red Mustard, Yukina Savoy, Pink Mustard Lettuce (Fedco) and Toi Sims (Snow Seed).

Some general bullet points about Winter Green Production:

- 1.) If possible orient your houses East to West. Better winter sun.
- 2.) Keep fresh air in the house! We have end wall vents open 24hrs a day unless it gets down to 18 degrees. We also don't cover the greenhouse grown greens with Covertan/Remay unless it is going to go below 26 at night. And removing the covers during the day is very important for disease prevention.
- 3.) Top water your original plantings but after that only use drip irrigation for keeping beds moist. Excess leaf moisture in winter can be very detrimental to all your greens.
- 4.) After five years of production start using "saturated media" soil tests vs conventional testing. It will give you a better picture of what is going on in your houses. Avoid over doing animal based manures and compost sources; they will only hasten the inevitable salt build up in your houses. Our nitrogen source in our greenhouses is now only peanut meal or Alfalfa Meal. No more composted chicken manure!!

- 5.) Remember it is the winter winds that do most of the damage to plants. It is, at least, equally important as keeping temperature sensitive plants covered during cold snaps and why high tunnel production is so effective.
- 6.) Our winter high tunnel production is (one house 1/2 Kale, 1/2 Swiss Chard.) (One 34X150 with five rows of: Yukina Savoy, Spinach, Red Mustard, Mei Qing Choi and Toi Sims.) (One 34X150 with six rows consisting of: Red Komatsuna, Red Choi, Joi Choi, Mei Quig Choi, JSS "Five Star Mesclun", Blue Vates Kale, Siberian Kale, Miners Lettuce, Hakuria Turnips, Spinach (Tye and Space). We have other inflation buster tunnels with a repeat of the above but in different successions.
- 6.) Keep your tunnels well ventilated, preferably with a top vent in the end walls. Your goal is to keep the humidity the same in the house as it is outside. This is very important detail for disease prevention and a good reason why more growers find it justifiable to spend the extra money to have a tall profile house. Our 34X150 have the peak of the house at 16'. A low profile 17' inflation buster is a inexpensive way to grow winter greens but you will be fighting a battle with excess humidity December - March.
- 7.) We don't cover our greens in our house with row covers until it gets down to 28 outside temp. The second cover goes on if the outside temperature goes down to 18. And if it goes down to 10 or below we will add a third layer.
- 8.) Remove the row covers everyday to get the humidity out of the greens canopy. Be sure to re-cover two hours before sundown. If you wait till dark you have already lost 60% of your heat gain.
- 9.) Exception: If it is cloudy and cold and the interior greenhouse air temperature is still below 29, keep the covers on.