

PEST ALERTS: On **onions**, **THRIPS** are now feeding in RI—populations tend to be local—watch for streaked middle aged leaves, but look for the little orange buggers down in the growing tip and control if you see an average of one to three per leaf—damage happens fast in this weather; **purple blotch** has been seen on onion—keep plantings weed-free to speed leaf drying; on **beets and chard** remember that **Cercospora leaf spot** starts on lower, older leaves that are beginning to lack nutrients— all the more reason to keep fertility up on these for extended harvest periods—also control weeds to allow rapid leaf drying; on **Brassicas**, imported cabbage worm in general seems lighter this year—look for damage in the centers of plants—small larvae can be hard to see and are often on the undersides of young leaves; **Striped cucumber beetles** continue to increase in numbers and damage—Surround is an option, but make sure your sprayer is always agitating in order to avoid clogging, and remember that new growth is unprotected; **Squash bugs** are now appearing, and egg laying should begin momentarily—control after eggs hatch, and apply treatment in evening or early morning when bees are not present; **potato flea beetles** continue locally on eggplants, potatoes, and tomatoes; **Colorado potato beetle** larvae are getting big, which means you are missing the best window for control, which is the first two larval stages—though eggs continue to be laid and keep hatching; **potato leafhoppers** are now very abundant on potato, eggplant, beans, and dahlias and hopper burn is starting to show—a few nymphs are around—they are light green on leaf undersides and move away rapidly, sideways—consider control when nymphs are easy to find on leaf undersides; **Early blight** (*Alternaria solani*) of tomato was seen on an edge row of a caterpillar tunnel—these plants are exposed to direct rainfall, unlike plants under full cover—this disease needs warm temperatures to develop, which until just this week, only existed in tunnels—so watch out for early blight and *Septoria* on field tomatoes and consider beginning protectant fungicide applications.

--> **Need to discuss? Got something you need looked at? URI Extension: 401-874-2967/andy_radin@uri.edu, hfaubert@uri.edu**

Dressing on the side, Please

Right now is PEAK vegetative growth time for numerous crops, leafy and fruiting alike. The sun is high, the weather is hot, the soil moisture is ideal. Nutrients need to be in place to maximize productivity if you've gone to all the trouble to get this far. As covered previously, **Fertigation** is one way to supplement during a crop's growth cycle. Another are the practices known as **side-dressing** or **topdressing**. This is the practice of applying supplemental dry fertilizers to rapidly growing crops, either alongside the row, or right over the top, depending on the type of applicator you are using, the crop being fertilized, and the accessibility to where the plants are growing. For instance, for a densely growing crop in which there are no longer any roads or paths through the field, top-dressing can be done by helicopter. (This is not a thing in Rhode Island.)

Like with fertigation, coarse-textured, well drained soils are susceptible to leaching, particularly of nitrate. Side-dressing ("split application") of nitrogen fertilizers is highly recommend on these soils. There-

fore, now is the time to stick to the plan if you split up your N applications. But if you didn't have a plan, now is the time to take a good look at the color and size of your crops and ask yourself if you like what you see. Base your assessment on 1) your most stellar past experience, 2) the amount of time since seeding or transplanting, 3) how rapidly the plants are growing, 4) the quality or depth of green-ness of the leaves, with attention to location on the plant. For instance, if you are looking at a kale plant that already has 10 or 12 leaves from bottom to top, the green pigment will vary. The newest leaves are not deep green— in fact, they can look pale. The very oldest leaves may be deep green, but may also begin to yellow as the youngest leaves demand the most N. The middle aged leaves should be deep green, the lowest of which should be fully expanded. But what does "fully expanded" mean? That it's not getting any bigger. But our vegetable varieties are capable of a lot given the right conditions. "Fully expanded" kale leaves can be 12" to 18" long. Sometimes the failure to achieve that stature is due to pot-bound transplants. In that case, there may not be a way to "unstunt" the plant, though it can still grow and produce good leaves.

Also, your customers may not want large leaves, so you may pick them before they can ever get that large.

The Pre-Side-dress Nitrate Test (PSNT) was developed by Fred Magdoff in Vermont (Co-Author of Building Soils for Better Crops) in the mid 80s specifically for field corn. Right now is when early and mid season plantings of corn should be shooting through the roof, and to do so, enough N must be available. The PSNT is a soil test to determine immediately available N at this time. It has been widely accepted for vegetable crops as well. The problem is that there is a turnaround time between sampling and receipt of results. So it may be easier to stick with split fertilizer planning AND do your own assessment. Leaf tissue testing provides a good assessment of crop health, especially for tomatoes, but again, there is turnaround time. For indeterminate tomatoes, which will produce for a long time, it is highly recommended.

If it's clear that you need to boost your crop, it is useful to have a good tool to do it with, regardless of the scale of the planting. There's a tool that spot-drops metered doses of dry fertilizer; a fertilizer hopper attachment is available for the most inexpensive one-row vegetable seeders; there are units that belly



mount on small cultivating tractors; and of course, there are large, three point hitch units. Fertilizer can also be "spin-spread" over the top of squash and pumpkin fields, but if using urea, it's important to do this just before a rain begins, or it will volatilize right up into the air.



Whether you are using organic or synthetic N sources, fertilizer efficiency is always hugely improved when the material is covered with soil. Organic sources need to be in contact with soil moisture where bacteria live that will degrade the material to release the nutrients. It's also important to apply near the growing front of the crop roots, without damaging feeder roots near the surface.

How much to apply? If you've calculated a total amount of N/area that you want to achieve, "splits" are often 25% and 25% of the total, with 50% applied up front. If you have not been keeping track of your application rate on a "per land area" basis, then try 25% of your initial application. In this wet spring, leaching of the initial N application took place, regardless of the N source, which may be the explanation for a lackluster performance so far, if that is what you are experiencing.

But you may also have a root disease or pest; but you will see some regular wilting if that is the case.

Call us if you want to discuss this, or any other production issues...

Your farm update HERE

Report from Middletown

It's finally heating up a little bit on our fair island, but we're still dodging the downpours. Last Saturday afternoon was a whopper, with thunder, lightning, high winds, and small hail. And Tuesday, well, we saw two inches of rain over the course of the afternoon and evening. The to-do lists keep getting longer, as we subdivide our time even further into markets, wholesale, CSA, planting for fall, and maintaining what we have out there right now.

Pests: most of the usual suspects have finally arrived (cucumber beetles, squash bugs, three-lined potato beetle). Still waiting on the inevitable universe of other beetles. We always find it a bit melancholy to take the row covers off the first round of zucchini and cukes, because they look so pristine for five minutes before the cucumber beetles find them. Most sprays are out for us, because we maintain seven bee hives and we make a lot more selling honeycomb than we do squash. We just move on and plant the next succession as soon as the first flowers.

On the positive side: we are looking at bumpers on favas, peas, and early potatoes. We walk up and down the potato rows shaking plants – no leafhopper yet. The plants are gorgeous, especially the purplish “Magic Molly”, and are benefiting from the incessant rain. We hope you are all doing well and that you have no Canada thistle to deal with (grr)!

The following is Part 2 of a section of the New England Vegetable Management Guide authored by Andy Radin.

Additional Soil Fertility and Nutrient Amendments

Plant Biostimulants, Biofertilizers, Microbial Biostimulants, Microbe-containing Bio-products

A biostimulant is a substance or microorganism (or mixture of one or more) applied with the intent of enhancing a crop's nutrient efficiency, abiotic stress tolerance and/or quality traits, regardless of the material's nutrient content. There are now hundreds of commercially available products that fall into these categories. This does not include products labeled for pest control purposes, however, which fall under strict EPA guidelines mandating EPA registration.

One category of these products is familiar to most: various strains of species of *Rhizobium* inoculants for legumes. Research has consistently shown the benefit of legume inoculation to realize full nitrogen fixation potential of legumes, provided that the plant and bacterial species are properly matched.

There has been a proliferation of mycorrhizal fungus inoculant products. These fungi are symbiotic with many crop plants (excluding Brassicas and a few others) and extensive research has shown their beneficial effects on plant nutrition, growth, and stress reduction in field, nursery pot and greenhouse conditions. The fungi live inside plant roots, where they obtain a carbohydrate energy source from plants. In turn, the fungal mycelia transfer water and mineral nutrients to plants, which they can extract from the soil volume more efficiently. In this way, the fungi “extend” the rhizosphere that surrounds plant roots.

Unfortunately, real-world test results of these products are not readily available. It is unknown at this time whether inoculation has short or long-term economic impact in annual vegetable production.

There are numerous other soil microbial inoculant mixtures available from commercial suppliers. Peer-reviewed research with many of these organisms has shown some positive potential. They are intended to influence crop plants' rhizosphere, promoting potential availability of mineral nutrients already present in the soil, sometimes by stimulating plant responses to stresses or diseases. They do not, however, directly supply nutrient elements to plants. There may well be a promising future for microbial inoculants, particularly if it means reduced fertilizer input, but product effectiveness has not been well documented at this stage.

Compost Tea

The legal definition of compost tea from the National Organic Program is “A water extract of compost produced to transfer microbial biomass, fine particulate organic matter, and soluble chemical components into an aqueous phase, intending to maintain or increase the living, beneficial microorganisms extracted from the compost.” Microbial species content is highly variable, depending on the source of compost and the “brewing” conditions. Compost teas have a very low analysis of plant nutrients. Although it is widely produced and used on farms of various scales, research evidence of its efficacy is inconsistent at best. Benefits of using commercial microbial inoculants are variable, and using compost tea is even less dependable despite its widespread popularity. If you do plan to use compost tea, care must be taken to avoid cultivating bacteria harmful to human health.

Humates, humic acids, humic substances

These materials are made of very large and complex molecules. Most commercial products are extracted from peat or soft brown coal deposits of lignite. Extraction processes and treatments vary widely, so it is difficult to make comparisons between various products on the market. Humic materials contain only small amounts of plant nutrients, thus are not considered fertilizers. Their usage has been promoted by some to provide physical, chemical, and biological benefits to soils. These materials have been studied for over 50 years, mainly in controlled settings, with mixed results from laboratory and greenhouse studies; some resoundingly positive reports, many neutral, and a few detrimental. Under field conditions there are few documented positive effects from their usage. Naturally occurring compounds in soil organic matter effectively perform the same functions, such as chelation of micronutrient metals, and possibly plant hormonal effects. Nevertheless, there are many commercial products available, and little consistency among them.

Seaweed extract products

Seaweeds have been applied to agricultural land for at least a few thousand years and until recently, their primary benefit was considered to be similar to that of other organic amendments, releasing nutrients through decomposition. It was discovered over 50 years ago that seaweed nutrient content was too low to directly boost soil test nutrient levels and that other growth stimulating mechanisms must be involved. Seaweed has been proposed to have several different effects on the root zone environment and on plants themselves.

Though seaweed extracts are used in crop production in large quantities world-wide, there is surprisingly little published research on their use and effectiveness in field settings. One of the more common claims is alleviation of the effects of environmental stresses, such as temperature and moisture extremes. Therefore, when used during typical conditions, their effects are hard to detect. Subtle effects are difficult to measure in the field, alongside many other possible factors.



Left: potato leafhopper nymphs; **Right:** bad case of hopper burn on snap beans.

