

# CROP TALK

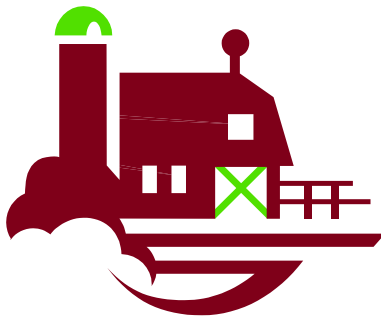


COMMERCIAL VEGETABLE AND FRUIT CROPS NEWSLETTER

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## Calendar Of Events

Annual Meeting: CT Pomological Society  
Wednesday, December 1, 2010, 8:00 AM – 3:15 PM  
Gallery Restaurant, Glastonbury, CT 860-659-2656  
Contact: [Lorraine.Los@uconn.edu](mailto:Lorraine.Los@uconn.edu), 860-486-6449

Connecticut GAP School (Good Ag Practices)  
Session I: Introduction and GAP Foundation Programs  
Dec. 6, 6-8:30 PM, New Haven County Extension Center  
Dec. 8, 9:30 AM-12:00, Tolland County Extension Center  
Contact: [Diane.Hirsh@uconn.edu](mailto:Diane.Hirsh@uconn.edu)

Connecticut GAP School  
Session II: GAP in the Field  
Jan. 28, 9:30 AM-12:00, Tolland County Extension Center  
Jan. 29, 9:30 AM – 12:00, New Haven County Extension Center

Connecticut GAP School  
Session III: GAP in the Packing Facility  
Jan. 29, 1:00-3:30 PM, New Haven County Extension Center  
Feb. 4, 9:30 AM – 12:00, Tolland County Extension Center

Connecticut GAP School  
Session IV: GAP: Putting it all Together  
Feb. 9, 6:00-9 PM, New Haven County Extension Center  
Feb. 25, 9:30 AM – 12:30 PM, Tolland County Extension Center

2011 North American Raspberry & Blackberry Conference  
January, 5-7, 2011, Savannah, GA  
Contact: [www.raspberylblackberry.com](http://www.raspberylblackberry.com)

CT Vegetable & Small Fruit Growers' Conference  
Thursday, January 20, 2011, 8:00 AM – 3:15 PM  
Tolland County AG/Extension Center  
24 Hyde Avenue, Vernon, CT 06066  
Contact: [Jude.Boucher@uconn.edu](mailto:Jude.Boucher@uconn.edu), 860-875-3331

North American Strawberry Research Symposium/Growers Association  
February 8-11, 2011, Tampa, FL  
Contact: <http://www.nasga.org/>



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## Case Study II: Deep Zone-Tillage (DZT) at Scott's Yankee Farmer, E. Lyme, CT

By Jude Boucher, Extension Educator

Farmers: Tom & Karen Scott, and daughter, Allison

Farm size: 125 acres (half owned, half rented)

Crops: Tree fruit, small fruit, sweet corn and mixed vegetables

Climate: Located in New London County about 3 miles from Niantic Bay on Long Island Sound, the farm enjoys some on-shore breezes (winds!) during the summer months and a slightly warmer fall than most of the state.

### Farm History & Markets

Tom's father purchased the farm in the early 1940s and originally ran it as a dairy. As the years went by the Scott family transitioned to tree fruit and, in the mid-70s, began retailing through pick-your-own operations and their own farm stand. Tom farmed all his life, and he and his wife Karen began to manage the farm in 1980. In 2008, they added a CSA program to their stand operation.

### Soils and identified soil health issues:

Scott Road – Agawam, Canton & Charlton sandy-loams.

Behind Stand – Paxton & Montauk sandy-loams (very stony).

Kowalski's (rented) – Haven & Enfield sandy-loams (stony).

Bert's (rented) – Merrimac sandy-loams.

John's (rented) – Paxton & Montauk sandy-loams (stony).

Prior to adopting reduced-tillage, Soil Health Tests identified consistent problems in most fields with low total organic matter, active carbon, potentially mineralizable nitrogen and excess subsurface hardness (plow pans). Other fields were rated mediocre or below optimum in available water capacity, surface hardness/crusting, root health and/or had low levels of potassium. Plow pans ranged in depth from 9 to 12 inches.

### Crop mix

Apples, peaches, plums, strawberries, blueberries, raspberries, sweet corn, corn maze, tomatoes (greenhouse and field), peppers, eggplant, pumpkins, summer and winter squash, cucumbers, cabbage, broccoli, cauliflower, spinach, Swiss chard, snap beans, lettuce & greens, peas, herbs, flowers, cider and donuts. They raise all their own transplants and flowers in 4 greenhouses.

### Rational for Adopting Deep Zone-tillage

Immediately upon hearing about DZT in 2007, Tom expressed interest in switching to this reduce-till method. He was mainly interested in the new system's ability to increase soil organic matter, improve soil structure, break up plow pans and improve soil drainage. He purchased a 4-row Underferth Zone Builder in the winter of 2008 and started zone tilling in April that same year.

### Early Experiences

Tom was not tentative about DZT and immediately set about using the new system on every crop on his farm, including his perennial crops, such as for strawberries and when replanting apple orchards. He figured that if it made sense to loosen the compacted soil under his annual plants, it made twice as much sense to loosen it under his perennial crops, since he would only have one chance at improving root growth. He even used the machine between the rows of strawberries during renovation to eliminate compaction causes by foot traffic during harvest.

Since the 4-row machine was as wide as a single road lane, Tom moved the machine across town to his rented fields during the middle of the night when there was less traffic. He later added hydraulic lifts on the depth wheels so he could tow the machine on the road instead of lifting it with the tractor hitch.

Because he had both early and late fields across town, but wanted to prepare them both for planting at the same time to minimize transporting the machine, he came up with a unique post-emergence herbicide program for his sweet corn. By the time he got around to planting the later field, weeds would have emerged. So, he used a combination of Callisto (3 oz.), Dual (1.5 pt), Atrazine (0.5 pt), Impact (0.6 oz), nitrogen and methylated seed oil, to provide both pre- and post-emergence control of weeds with a single post-emergence application. Upon learning that he wasn't suppose to apply two herbicides from the same family (Callisto and Impact) during one season; he later gave up all but the Impact, oil and ammonium sulfate treatments. This single herbicide, nitrogen and oil treatment is capable of controlling both broadleaf and grass weeds if applied to the right size weeds. However, because the weeds emerged sooner in the seedbed (zone tilled strip) than from under the cover crop mulch between the rows, there was no way to make a single application before the grass in the crop row was too large to kill. He eventually settled on two applications on his sweet corn: Dual applied pre-plant/pre-emergence, and if necessary, Impact, nitrogen and oil applied post-emergence, after the weeds came up from under the mulch between the rows.

### Tom's Procedure and Techniques using DZT

A Soil Health Test was conducted on each of Tom's vegetable fields to provide preliminary data on chemical, physical and biological attributes. He will re-test them in 5 years to see if DZT has helped improve his soil health and removed the plow pan.

All of Tom's vegetable fields are planted to winter rye for a cover crop. Tom kills the cover crop when it is 4 to 12-inches tall using Roundup and oil, at least 3 weeks prior to zone building and planting. He tried using paraquat and oil on one early corn field when the temperatures were low to see if he could get a faster kill, but ended up re-spraying with Roundup to get a complete kill. He usually mows off the previous season's crop and spins on his cover crop in the fall. However, in the Field(s) where he planned to make raised-beds the next season, he used to harrow in the cover crop seed in the fall to improve seed-to-soil contact and germination, but also to loosen the soil so that he can make the beds in an unplowed (zone-tilled) field in the spring. Tom found that the ground was too hard to make beds with just zone tillage in the spring if the cover crop was mowed off in the fall.

Tom has been transplanting all his small-seeded crops, such as beets and Swiss chard, for years to improve emergence and plant stands. He used to use his zone builder to subsoil under the planting row before preparing and covering his beds with plastic. In order to gather up

enough soil to make a raised-bed in the untilled, rye-mulch-covered ground, he added extra-large, aggressive, 22-inch disks to his bed-maker. For single row crops, like tomatoes, he would leave a strip of untilled mulched soil between the beds. However, with double-row crops, like peppers, he used to run his zone builder up and back to subsoil under both rows in each bed. On his return trip, he passed close to the first pass to loosen the soil under both crop rows in each bed, but because he has a 4-row machine, he ended up zone-tilling 4 beds at once, and there was no rye-mulched-ground left between the beds. Since all the ground ended up being tilled by either the zone tiller or the bedder, this seemed to run counter to the philosophy behind reduced till. However, Tom felt that he still eliminated the plowing and harrowing prior to bed-making and that it was just as important to loosen the soil under his bedded crops as under his non-bedded crops. He pointed out that on other farms where they only zone-till their large seeded crops (i.e. sweet corn and pumpkins), and rotate their land, they end up skipping reduced till all together the year they bed the ground for solonaceous or cucurbit crops. He noted that when he bedded a piece of land, he at least reduced the number of passes with tillage equipment and continued to loosen the soil and break up the plow pan under the row.

In 2010, Tom discontinued using his Unverferth Zone Builder to prepare beds and built a homemade “zone tiller” to loosen soil under the crop row before making beds. Originally, this consisted of 2 chisel plows, followed by coulters to help loosen the soil for the bed-maker. However, his latest model consists of only 4 chisel plows, spaced about 11-inches apart to loosen the soil under the bed. The chisel plows facilitate the bedding process and leaves rye-mulched-ground undisturbed between the beds.

He uses a 4-row John Deere 7000 planter for large-seeded crops, with 36-inch row spacing, so his Zone Builder is set up to match. The subsoiling shank on the zone builder is usually set to a depth of 15 inches to break up the plow pan. Dawn (brand) residue managers, attached immediately in front of each shoe on his planter, help clear away any remaining cover crop residue or stones that the Zone Builder fails to remove from the seedbed. The Dawn residue managers have a knob to easily make fine adjustments in height, so that only debris and not soil is removed from the planting row. Common pre-emergence herbicides are used on most crops at planting or post-emergence herbicides are used between beds.

In 2009, Tom designed and built a fifth-wheeler-style, goose-necked hitch that allows him to pull his planter behind his Zone Builder. This hitch allows Tom to prepare the field and plant it in a single-pass, thus further reducing soil compaction and fuel consumption. He pulls his machines with a 110-hp John Deere 4240 tractor and has added a quick-attach forklift weight to the front end to compensate for the weight of the Zone Builder. Because he has rocky soils he usually drives at about 3 mph, which is slower than is usually recommended for a zone tiller. Growers with rock-free ground sometimes zone till at 7-8 mph.

Fields are spread with lime in the fall. Potassium, phosphorus and nitrogen are banded at planting and ammonium nitrate and/or urea is side-dressed when the corn is 8 to 20 inches tall.

### **Notable Changes in the Field Preparation Process**

The biggest changes in preparing Tom’s fields include an additional herbicide application to kill the cover crop, and the speed at which he can now prepare a field. He doesn’t miss the plowing, harrowing and many passes with a cultivator or the dust associated with conventional tillage. He notes that he still uses his in-row Reggie cultivator for crops like pumpkins, winter squash and strawberries. Tom has also eliminated the backbreaking chore of picking rocks on his stony ground. Now, he simply removes the occasional large stone which the zone tiller pulls to the surface with the front bucket on his tractor. He has also switched to mowing off crop residue before spinning on cover crop seed for all of his acreage rather than harrowing in the crop residue and seed.

Originally, Tom planned to buy a second one-row zone builder for his pumpkins, so he wouldn’t have to take tools off to increase row spacing. However, since he usually grows pumpkins on plastic mulch, he now uses his homemade chisel plow to loosen the soil for his pumpkin beds as well.

### **Tom’s DZT Equipment and Modifications**

Underferth 4-row Zone Builder, equipped with a 22-inch wavy front coulter, re-set springs for the sub-soiling shanks, two 13-inch coulters, and rolling baskets. He used shims to reduce the spring reset tension from 8,000 to 6,000 psi so that the shanks would trip faster in his rocky ground.

He also built a goose-necked hitch to tow his planter and added hydraulic lifts on the depth wheels of his Zone Builder so he could tow instead of carry his machine on the road.

4 Dawn (brand) Residue Managers for planter.

4 plastic seed firmers (for uniform seed depth and emergence)

2 22-inch aggressive disks for his homemade bed-maker.

Homemade 4-shank chisel plow to help prepare raised or flat plastic-mulched beds.

Brushhog rotary mower (to prepare field for seeding cover crop)

### **DZT Benefits and Drawbacks**

Tom measured out 2 square acres of field and used conventional tillage (plow and harrow) to prepare one acre for planting and deep zone tillage to prepare the other. He measured both the time it took him to prepare the planting site with each technique and the amount of fuel used to do so. He found that it took him 1.5 hours to prepare the field with conventional tillage and just 0.5 hours with DZT: a 66% reduction in preparation time. He also found that he reduced his fuel consumption from 4.5 gallons/acre to just 1.25 gallons/acre using the new reduced tillage method: a 72% reduction in fuel consumption. This was done before Tom built the hitch for his planter.

He then estimated that if he had included planting time, he would have reduced his time to prepare and plant the field by 80-83%, because he could pull the planter behind the zone builder and accomplish both tasks at the same time (0.5 hours), while it would have involved another trip across the field after conventional tillage. Planting may have added another gallon of fuel to the conventional method, resulting in a total fuel savings of 77% using DZT. His calculations did not include cost reductions for machine-hours, reduced cultivation time and less time spent picking rocks.

Tom has experienced both increased water drainage in his fields after storms and the preservation of soil water during drought conditions due to DZT. He has watched 3 to 5-inch rainfalls absorb into the ground within hours where it used to stand for days in low wet holes. He even has a set of pictures of himself in another grower's field (only 100 yards from one of his fields) knee-deep in water after a storm and again 3 days later. The standing water soaked into Tom's DZT field within three hours the same day. During the wet 2009 season, Tom estimated that he increased his yields by 12% because he was able to plant on time despite the rain and plant some areas he would not have normally been able to in a wet season.

It is common for the E. Lyme area to go six or more weeks without rain during mid-summer because of on-shore winds that seem to blow the clouds inland. Tom has some rented sweet corn fields without water and has experienced better plant stands with much less wilting or drought-related crop damage since switching to DZT. In fact, with the extreme dry conditions in 2010, he didn't feel the need to hook up his irrigation for his pumpkins and the crop did well.

The main drawbacks that Tom has observed with DZT, are the additional herbicide applications and "just getting acclimated to a different system." He continues to explore ways of getting good weed control with a single application and another to kill the cover crop. He also continues to build and modify his equipment to perfect zone tillage.

#### **Art of DZT (What has Tom learned)**

Tom has learned that you can't skip the pre-emergence herbicide application for corn because weeds emerge in the row and between the rows at two different times. This is a particular problem if you prepare a field way ahead of time with the zone tiller and plant much later (6 weeks). You also lose the benefit of retaining soil moisture for quick crop seed emergence if you delay between DZT and planting.

He also learned the hard way, by popping a wheelie, that you need extra weight on the front of the tractor to counterweight the Zone Builder. He had originally purchased a hitch from the dealer to pull his planter behind the Zone Builder. However, the hitch was designed to stick straight off the back of the machine and weighed 200 pounds. After his wheelie experience, he decided that a goose-neck hitch that brought the weight of the planter up near the tractor would be much safer. He returned the original hitch to the dealer and built his own. His hitch has worked well.

He learned that ground that isn't at least lightly harrowed in the fall is hard and tough to bed in the spring if you are just zone tilling prior to bedding. He has not experienced this same problem when he pre-conditions the ground with chisel plows immediately before making raised-beds.

He also confirmed that, although he loves DZT, he doesn't like standing up in front of a crowd talking about it (public speaking). He would rather talk to farmers interested in DZT one-on-one.

#### **Tom's Advice to Farmers Interested in DZT**

DZT is a much faster, cheaper and easier way to prepare your fields and you improve them at the same time. "There is no turning back ☺!"

DZT works much better if the cover crop is completely dead. Spray Roundup 3 weeks before you DZT and plant.

#### **What's next?**

Tom will be adjusting all his equipment from a 36- to a 30-inch row spacing for next season. He hopes to continue to help other growers transition to DZT. He invites you to give him a call and/or come for a visit to see his equipment.

#### **Tom Scott**

**Scott's Yankee Farmer**

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**E. Lyme, CT 06333**

**860-739-0247**

[Thomas\\_S.Scott@sbcglobal.net](mailto:Thomas_S.Scott@sbcglobal.net)



#### **Thank Your Neighbor for Planting Bt Corn**

By Jude Boucher, Extension Educator

A recent report in Science (8 Oct. 2010, Vol. 330, pp. 222-225) confirmed that "area-wide suppression of European corn borer" (ECB) populations is taking place in many of the large corn-producing states due to the increase of Bt corn production (now more than 63% of the corn crop in the U.S.). The surprising part of this study was that growers who plant traditional non-Bt corn are benefiting by the ECB population decline even more than the growers who use the genetically modified corn. Scientists calculate that a total of \$6.9 billion dollars have been saved over the last 14 years in Illinois, Minnesota, Wisconsin, Iowa and Nebraska due to the production of Bt corn, and \$4.3 billion in benefits went to the non-Bt corn growers. The reason is two fold: higher yields due to better pest control in both Bt and non-Bt corn, and lower seed costs for non-Bt corn producers. Researchers calculated that 63% of the total financial benefit went to the non-Bt growers and that corn borer populations have declined by up to 73% in some states.

So thank your neighbors who grow Bt corn for lower ECB levels on your farm. Even if you're an organic grower and don't believe in or support the use of GM products, you get to benefit from this corn. Since ECB has over 200 hosts, including peppers, snap beans, tomatoes, cabbage and other vegetables, you don't have to be planting sweet corn to reap the benefit.

Not so fast you say, what do ECB populations in Nebraska and Minnesota have to do with vegetables in Connecticut? Well it may be just a coincidence, but ECB populations in our pheromone traps and in early season sweet corn plantings peaked back in 1994 and have been dropping dramatically during the last decade. In fact, for the past 5 years I have been reporting extremely low populations on UConn's weekly Vegetable Pest Message. So, maybe the "area-wide" suppression is really nation-wide suppression.

How low? Well let's see. In August of 1994, during the second generation moth flight, we captured an average of 279 moths per farm in pheromone traps during the peak week and a high of 910 moths at one Enfield farm. Unfortunately we didn't run traps during the first generation moth flight in June back then. However, we did scout whorl and pre-tassel stage sweet corn fields. In 1994, the average infestation for June in late-whorl and pre-tassel stage sweet corn fields was 51% (51% of the plants infested with larvae) with a high infestation of 86%.

By August of 2006, the highest average pheromone trap moth catch for any week in August had dropped to just 22 moths per farm, with a high catch for the month of 40 moths. Trap catches have remained this low or lower ever since: the highest average moth catch on any week in August this year was just 10 moths per farm. In June of 2006, late-whorl and pre-tassel stage corn peaked at 30% of the plants infested, with a high of 50%. We did have one corn planting in CT this year with an infestation of 75%, but that has become the rare exception. One farmer on the IPM program didn't have to spray his corn at all for borer this summer. Another wholesale pepper producer told me it had been several years since he had sprayed his peppers for borer and he claimed he had very few borers in his peppers (I can verify that he didn't have many this year). You couldn't do that in the 90's without losing a lot of your crop. Coincidence? Maybe, but I think not.

So when you get a chance, remember to thank your neighbor for planting that Bt corn. He has saved you money and maybe even some of your crop.

**Earth is here so kind, that  
just tickle her with a hoe  
and she laughs with a  
harvest.**

**(Quote by - Douglas  
Jerrold)**

## **NOVEMBER IS DEADLINE FOR INSURANCE ON APPLES AND PEACHES IN CONNECTICUT**

**(Reprinted from the CT Weekly Agricultural Report)**

The final date for Connecticut apple and peach growers to obtain crop insurance on next year's crop is November 20, 2010. Current policyholders likewise have until November 20 to make any changes to their existing contracts. Price elections for 2011 will be \$13.75 per bushel for fresh apples and \$37.25 per bushel for fresh peaches. Crop insurance provides coverage against production losses due to damage caused by natural perils and adverse weather conditions such as hail, wind, frost, and drought. Your actual amount of coverage will be determined from your actual yields and the protection level you select. Fruit producers should consider making crop insurance an essential part of their overall risk management plan to help protect their operations from financial loss. Growers are encouraged to contact a local crop insurance agent as soon as possible for more detailed information and premium quotes. For a list of crop insurance agents in your area, contact the local USDA Farm Service Agency office or log on to the following Risk Management Agency web site:

<http://www3.rma.usda.gov/apps/agents/>



## Seeders for High Tunnels and Field Greens

By Ruth Hazzard

UMASS Vegetable Notes, September 16, Vol. 21, No. 21

High tunnels provide a growing environment that opens the door to year-round vegetable production at a reasonable cost. These unheated structures, with one or two layers of plastic, vented by means of roll-up sides and endwall vents, require lower energy and infrastructure inputs than full-scale greenhouses. By using interior row covers close to the crop, cold-tolerant crops can be grown through the winter for continued growth and harvest in early spring. These crops include Brassica greens such as Tatsoi, Mizuna, Yukina Savoy, Siberian kale, Winterbor kale, salad turnips such as Hakurei, radishes, lettuce, spinach, chard, and Winter sprouting Broccoli. Frost-sensitive crops such as summer squash or tomato can also be started in spring for an earlier harvest, or started in late summer to extend into fall.

Growers across New England and the US have been using and learning about high tunnels for over twenty years, but they are new to many vegetable growers in the region. This year, through a special funding program from the Natural Resources Conservation Services, over 60 new high tunnels are being built in Massachusetts. Across the US, 2300 tunnels are being built. This represents a terrific opportunity for each farmer to figure out which crops best fit their needs, markets, and yearly schedule.

This is the season for seeding greens that will grow during September-November for Dec-February harvest. The period from late November until late January, with short days, low light, and cold temperatures, won't produce much new growth, but the period both before and after can generate good crop growth and many crops can weather that dead zone to be harvested or to grow on. Greens can also be grown in the field under low tunnels or row covers for harvest in November-December.

High tunnel bed space is valuable real estate and needs to generate good yields to turn a profit. To get reliable, consistent densities, a good seeder is a vital tool. Consistent between-row and in-row spacing is key. Flexibility for different seed sizes is also important: Brassica seeds are small and round but vary greatly in size; lettuce is larger; spinach, chard, and beets are larger still. This article will attempt to review several options for one-row and multiple-row seeders based on conversations with growers and various resources. This is a work in progress and I welcome feedback and input on what seeders work or don't work, other seeder options, or how to make each one perform best. This article presents information that is available at the time of printing; no endorsement or lack of endorsement is intended or implied. With all of these seeders, as with most any farm implement, expect to spend some time tinkering and testing different seeding plates or rollers with various seeds in order to get just the spacing that you need.

### Seeders

**Earthway.** Source: Johnny's Selected Seeds, Earthway Outlet, Sutton Ag, price range \$90-110. Single row, 6 seed plates. Lightweight, easy to change plates. Seed plates are preset to provide spacing that is typical for the crop. For small seeded crops (eg Brassicas) use cauliflower (extra) or radish (standard set) plate; set for 1 inch space but will give a dense spacing in the row for smaller seeded Brassicas. To adjust spacing, plug some holes with beeswax or caulk.

Notes: Many growers use this seeder for a range of seed sizes in both field and hoophouse and are happy with it. One problem with this seeder is that small seeds can get caught behind the seedplate and damaged; manufacturer recommended washing plate in soapy water to solve this. Another limitation is that the seed spacing cannot be adjusted except by plugging holes in the seedplate. Several can be bolted together to plant several, evenly-spaced rows; they can also be purchased as a multi-row seeder.

**Pinpoint seeder.** Johnny's Selected Seeds. \$239. Requires fine seedbed without residues, lumps, or stones. Designed for small seeds (lettuce, Brassicas) and close spacing within-row. Plants four rows 2 1/4" apart, or optionally two rows 4 1/2" apart or two rows 6 3/4" apart. Designed to be pulled. Handle included. Comes standard with four seed-hole sizes for small to medium size seed. <http://www.johnnyseeds.com/c-460-seeders.aspx>

Notes: Feedback that I have heard from growers indicates that it is difficult to get the desired efficiency and seed placement with this seeder. Requires rolling the seedbed before and after planting for a semi-firm surface and to cover seed after planting. See Six-row seeder below.

**Six-row seeder.** Johnny's Selected Seeds, \$549. An improved version of the 4-row pinpoint seeder based on feedback about the pinpoint seeder. Requires fine seedbed without residues, lumps, or stones. Up to six rows can be planted at once with 2 1/4" spacing between rows. A roller in front firms and levels the soil. One in the back closes the furrows and drives the seed shaft. Four hole sizes are provided for seeds from raw carrots through pelleted lettuce. Three different drive ratios give spacing within the rows of 1", 2", or 4".

<http://www.johnnyseeds.com/c-460-seeders.aspx>



**Johnny's six row-seeder**

**Clean Seeder.** Manufactured by Jang Automation Co., Ltd, distributed by Mechanical Transplanter. 800-757-5268. One -row without fertilizer hopper, \$379. Drive wheel that turns seed roller, press wheel behind. Seed rollers for varying seed sizes and number of seed holes per roller (to change seeding density). Gear ratios can be changed to alter seeding density for a given seed size. With adjustment of these three elements this seeder can give a range of seed densities. Seed hopper has a cover. Can handle more trash and unevenness in the seedbed compared to the six-row and pinpoint seeders. Multirow and tractor-mounted designs also available. <http://www.mechanicaltransplanter.com/seeder.html>.

Notes: We have used this seeder at the UMass Student farm and have found it effective in giving various spacings for various size seeds, given that you take time to play around with it. Easy to collect the seeds dropped per 3 ft (one turn of the wheel) to estimate seed count. Good weight for hand use by one person.

**Sutton Jr. and Mini-Sutton Jr. Seeders.** Sutton Agricultural Enterprises, Inc. Price starts at \$1,950 for the Sutton Jr., and \$1,671 for the MiniSutton Jr. These are designed specifically for high density, small plot planting, to be hand-driven by one or two people. Sutton Jr is 80-lb Sutton Jr. while MiniSutton Jr. weighs about 65 lbs. and has a narrower handle. Large ground wheel drive in front provides seed agitation, bed is firmed both before and after seeding by PVC rollers. Sutton Jr can seed up to 17 rows on 24 inch wide bed, or seed wider between-row spacing by closing off some of the tubes or using a seed plate with fewer holes. A single hopper feeds all rows. Plastic seed plates with varying hole sizes and spacing can be done easily and can be custom ordered to fit your needs Larger, tractor drawn seeders are also available. <http://www.suttonag.com/SuttonJr.html>.



**Sutton Jr. Seeder**

Notes: One grower reports being very satisfied with this seeder for intensive greens production-seeds quickly and efficiently which is very helpful for a situation with a limited workforce.

## Uconn Soil Testing Lab Now Offers Plant Tissue Analysis

By Dawn Pettinelli, Extension Educator  
Manager of UConn Soil Nutrient Analysis Laboratory

### Plant Analysis



#### Why Plant Tissue Analysis?

Analysis of plant tissues is an extremely useful tool for growers. Not only can plant tissue testing be used to monitor the nutrient status of plants but it can help identify nutrient deficiencies and imbalances. This allows growers to more effectively tailor their nutrient management programs to meet a crop's specific needs. Cost savings may be realized if nutrient deficiencies are resolved before they adversely affect production and also if unnecessary fertilizer applications are avoided.

#### Why Not Just Test the Soil?

Soil testing is also a valuable tool and is often used in conjunction with tissue testing. Soil tests should be taken before planting and at regular intervals once plants are established. The soil pH is of special importance because it affects the availability of all plant nutrients. There is often not a strong relationship between the nutrient levels in soil and in plant tissue. This is because many factors affect the ability of plants to take up nutrients. Tissue testing is the best way to find out the nutritional composition of plants.

#### In What Circumstances Would Plant Tissue Analysis Be Suggested?

**Routine Assessment** – Leaf and/or petiole samples are collected at the appropriate time of year and sent in every 2 to 3 years to monitor nutrient levels in plants and fertility program.

**Trouble Shooting** – If observing leaf symptoms that may indicate a nutritional problem, samples are sent in from plants showing symptoms and also those without for a comparison.

#### What Nutrients Does the UConn Plant Tissue Analysis Measure?

Results would include total percent nitrogen, phosphorus, potassium, calcium and magnesium along with the parts per million (on dry weight basis) of boron, copper, iron, manganese, molybdenum, sodium, zinc, aluminum and lead.

Results will indicate whether each nutrient is within sufficiency or average ranges.

Fertilizer recommendations are not provided with plant tissue analysis. Use the results along with soil tests and suggestions from University of Connecticut Extension Specialists to modify your fertilizer regime.

**Lead** is a contaminant and not a plant nutrient. It will be noted if the lead levels in the plant tissue are elevated. This is often a concern when growing vegetables, herbs or fruits in areas that were exposed to lead paint, leaded gasoline and other sources of soil lead contamination.

#### What is the Cost of a Plant Tissue Analysis?

The cost is \$20 per sample and includes the drying and grinding necessary for sample preparation. A check should be made payable to the University of Connecticut

#### What is the Turnover Time for Plant Tissue Analysis?

Because it may take several days to dry the tissue, the turnover time would be approximately 2 weeks.

#### Sampling Instructions

The time of year to best collect plant tissue samples, the number of plant parts (i.e. leaves, petioles), and the type of plant part varies by plant species. For best results, call the Soil Nutrient Analysis Laboratory at (860) 486-4274 and speak with one of our employees or look at the **Plant Tissue Analysis Collection and Sampling Guidelines**.

(<http://soiltest.uconn.edu/analysis.php>)

Plant Tissue Analysis Collection and Sampling Guidelines		
Vegetables	<a href="#">PDF</a>	
Turfgrass	<a href="#">PDF</a>	
Fruit	<a href="#">PDF</a>	
Christmas Trees & Greenhouse Crops	<a href="#">PDF</a>	
Analysis Interpretation Sheet	<a href="#">PDF</a>	
Questionnaire for Plant Tissue Analysis	<a href="#">PDF</a>	

**Note: Samples should be placed in paper, not plastic, bags!**

#### Where Do I Send or Bring My Samples?

Soil Nutrient Analysis Laboratory  
6 Sherman Place, U-5102  
Storrs, CT 06269-5102

Samples can be mailed or brought to the laboratory, Monday through Friday from 8:30 a.m. until 4:30 p.m. Please call us for more information or for questions at (860) 486-4274.

## Interpretation of Results

Results from the University of Connecticut Plant Tissue Analysis are meant to serve as indicators of a plant's nutritional status. Although plant tissue analysis has been in use for quite some time, there is still considerable interpretative data lacking for some elements, certain crops, specific stages of plant growth, and for some elements hazardous to human health. For each essential plant nutrient there exists a curve similar to Figure 1. (below) On the right one can see that a deficiency in a nutrient will cause plant growth and production to be reduced to very low levels. As that nutrient level increases, plant growth and productivity will also increase until a plateau is reached where the addition of that one nutrient no longer results in increased yield. The values on this plateau are generally thought to represent the sufficiency range for that particular element. The actual values delineating the sufficiency range of an essential element would be wider for nutrients needed in large amounts, like nitrogen and potassium, and much narrower for those needed in trace quantities such as boron or zinc. At a certain point, the addition of more of this one particular nutrient would cause growth and yield to decline. This may be caused by adverse physiological effects occurring within the plant (toxicity) or nutrient interactions. Often plant tissue samples are submitted because of a suspected nutrient deficiency or toxicity. While these problems would be found on either end of sufficiency ranges, do take into account that the actual nutrient level where growth reduction or injury would occur may vary depending on the amounts of other plant nutrients, the plant's growth rate, and environmental factors so an absolute value where a deficiency or toxicity would occur may not be able to be specifically defined. It is also imperative that the sample submitted be collected in an identical manner and stage of growth as the reference sample which is used to compare and interpret the results. Please follow the species specific sampling instructions for most reliable results.

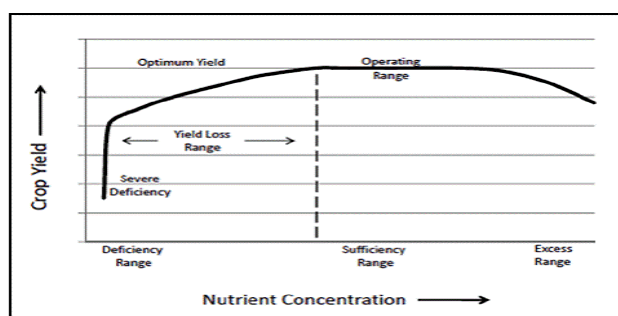


Figure 1.

(Reprinted with permission from R. L. Mikkelsen from Plant Nutrition Today, Fall 2009, No. 3.)

Plant analysis results can be interpreted in several ways. Most typically the values obtained through testing are compared to an established norm. The three most common systems of plant analysis interpretation are use of critical values, sufficiency ranges or DRIS norms. The UConn lab presents plant analysis results and comparison sufficiency ranges. Sufficiency ranges are published for plants where enough research and survey work has been done to reliably establish deficiency, sufficiency and toxicity levels over a broad range of growing conditions. For a few crops, sufficiency ranges have not been published and survey ranges are used. For a survey range the upper and lower limits of sufficiency are not as clear cut and more work needs to be done to determine these values. Use survey ranges as a general guide for determining if sufficient nutrients are present or not. Occasionally results are presented compared to survey averages which are exactly what they imply – average values for a number of healthy, well-established, productive plants.

For more information on plant tissue analysis see the collection and sampling guidelines for specific crops, and the questionnaire to be filled out when submitting samples (download at <http://soiltest.uconn.edu/analysis.php>).



*Your future is still before you. Your land is a vast storehouse of mineral and agricultural wealth awaiting further development for the benefit of mankind. Its potentialities are magnificent. (Quote by - Charles E. Wilson)*

**CONNECTICUT POMOLOGICAL SOCIETY  
Annual Meeting  
Wednesday, December 1, 2010**

**The Gallery Restaurant**  
141 New London Turnpike  
Glastonbury, CT  
860-659-2656

- 8:00 Registration, Socialize, coffee, doughnuts
- 8:45 Opening remarks. Rick Macsuga, President, Connecticut Pomological Society
- 9:00 Update on Peach Bacterial Spot Research. Dr. Robert Marra, The Connecticut Agricultural Experiment Station.
- 9:30 Connecticut Agricultural Business Management Guide. Joe Bonelli, UConn Cooperative Extension System
- 10:00 Exclusion Fencing for Connecticut Farms. Daniel Maltby, River Valley Fencing, Deerfield, MA
- 10:30 Break
- 10:45 The Tall Spindle System: The Path to Fun and Fortune. Dr. Terence Robinson, Cornell University, Geneva, NY
- 11:45 Introduction of Vendors and Other Guests
- 12:00 Lunch
- 1:15 Business Meeting, Awards, Other Announcements
- 1:45 Predicting Chemical Thinning with the Carbohydrate Model. Dr. Terence Robinson, Cornell University, Geneva, NY
- 2:45 An Alternative Work Force: A great opportunity to cultivate loyal productive employees. Jim Lyman
- 3:15 Apple Break, Pesticide Credits and Socialize

**Pesticide re-certification credits will be available.**

# Connecticut GAP School (Good Agricultural Practices)

Good Agricultural Practices are guidelines developed by FDA (US Food and Drug Association) and USDA (United States Department of Agriculture) to help produce farmers reduce the chance that their products will be contaminated by food borne pathogens such as *E. coli O157:H7* and *Listeria monocytogenes*.

While there is no regulatory requirement (state or federal) for farmers to have a GAP food safety program, some retailers and distributors want their suppliers to have GAP programs in place. A third party and/or USDA audits may also be required. Cooperative Extension, in cooperation with the Department of Agriculture is conducting a **GAP School** to help farmers comply with customer demands for a GAP program and for those who want to develop a food safety plan in order to add value to their business, whether required to, or not.

**How is the Connecticut GAP School going to be different from other GAP workshops I might have attended?** This school will be comprehensive, providing farmers with more of the tools they need to develop a GAP food safety program. You will get some experience writing a plan as well. The School will consist of four sessions. A series of weekday sessions will be held at the Tolland County Extension Center in Vernon. A series of night/ weekend sessions will be held in the New Haven County Extension Center in North Haven to accommodate varying schedules and the part-time producer. Depending on your availability and preference, you may attend sessions in either location. **Pre-registration is required. You will not have to attend all four sessions, only those you wish to attend.**

**Registration:** You may register for all four sessions for \$35 per person. If you prefer to register for single sessions, the fee will be \$10 per person, per session. **You must pre-register. Registration materials must be received by December 1, 2010.**

**Registration Form** (Please make a copy and complete for each person registering.)

**\*\*Please make a  check next to all sessions you plan to attend\*\***

	<b>New Haven County Extension Center 305 Skiff Street, North Haven 06473</b>	<b>Tolland County Extension Center 24 Hyde Avenue, Vernon 06066</b>
<b>Session I: Introduction and GAP Foundation Programs</b>	<b>December 6, 2010 6 pm to 8:30 pm</b> Snow date: December 8, 2010 6-8:30 pm	<b>December 8, 2010 9:30 am to 12 noon</b> Snow date: December 13, 2010 9:30 am to 12 noon
<b>Session II: In the Field</b>	<b>January 29, 2011 9:30 am to 12 noon</b> Snow date: February 5, 2011 9:30 am to 12:00 pm	<b>January 28, 2011 9:30 am to 12 noon</b> Snow date: January 31, 2011 9:30 am to 12 noon
<b>Session III: In the Packing Facility</b>	<b>January 29, 2011 1 pm to 3:30 pm</b> Snow date: February 5, 2011 1 pm to 3:30 pm	<b>February 4, 2011 9:30 am to 12 noon</b> Snow date: February 14, 2011 9:30 am to 12 noon
<b>Session IV: Putting It All Together</b>	<b>February 9, 2011 6 pm to 9 pm</b> Snow date: February 14, 2011 6 pm to 9 pm	<b>February 25, 2011 9:30 am to 12:30 pm</b> Snow date: February 28, 2011 9:30 am to 12:30 pm
<b>I will attend four sessions, some at each site</b>	<b>I will attend all four sessions in North Haven</b>	<b>I will attend all four sessions in Vernon</b>

**Registration is \$35 for all four sessions, \$10 for any single session. Please make checks out to the University of Connecticut or UCONN. Registration must be received by December 1, 2010.**

**Send to:** Diane Wright Hirsch, New Haven County Extension Center, 305 Skiff Street, North Haven, CT 06473

If you need additional information, please contact Diane Wright Hirsch at 203-407-3163 or [diane.hirsch@uconn.edu](mailto:diane.hirsch@uconn.edu) or Candace Bartholomew at 860-570-9067 or [candace.bartholomew@uconn.edu](mailto:candace.bartholomew@uconn.edu).

Total registration fee included: \$

Participant Name:

Operation (Farm) Name:

Address:

Phone Number:

Email Address:

(Please make sure that this phone is one that can be called in case weather causes us to postpone a session)

Products/commodities produced on your farm:

## **CONNECTICUT VEGETABLE & SMALL FRUIT GROWERS' CONFERENCE**

**Thursday, January 20, 2011**

Tolland County Agricultural Center, 24 Hyde Avenue (Route 30), Vernon, CT  
**Sponsored by:** University of Connecticut Cooperative Extension System & USDA  
 UConn Department of Plant Science and Landscape Architecture  
 The Connecticut Agricultural Experiment Station  
 Trade Show Exhibitors

8:00-9:00 Registration \$30 at the door - Trade Show/Coffee & Donuts (included in Registration)

PROGRAM: Morning Moderator – Jude Boucher, UConn Extension

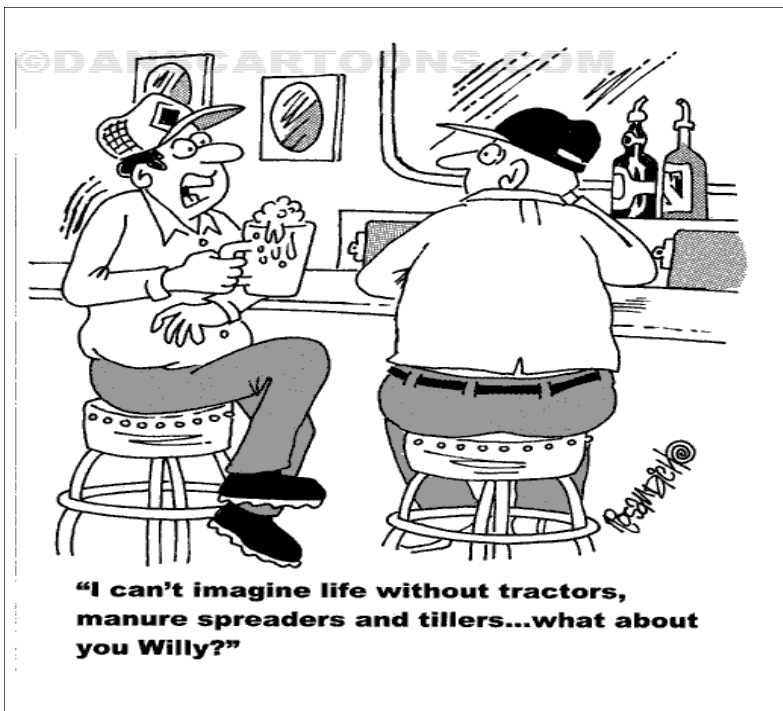
- 9:00            *Welcome* – Jiff Martin, Sustainable Food Systems, UConn Extension
- 9:05            CT Agricultural Business Management Guide – Joe Bonelli, UConn Extension
- 9:30            Phytophthora Moves to Beans – Jim LaMondia, CT Ag Experiment Station
- 10:00           Spice up Your Market with Novel Cucurbit Varieties – Brent Loy, UNH
- 10:30-10:45   Break (Trade Show/Coffee & Donuts)
- 10:45           Solving the Cover Crop Puzzle – Steve Groff, Cedar Meadows Farm, Holtwood, PA  
 (Fitting Cover Crops into Your Farming System)
- 11:15           Pre- and Post-Harvest Considerations for Maximum Quality in Squash– Brent Loy, UNH
- 11:45           Raspberry Pruning and Training – Nate Nourse, Nourse Farms, Whately, MA
- 12:15 - 1:15   Lunch Break/Trade Show (**Lunch included in registration fee as a 4-H Club benefit**)

PROGRAM: Afternoon Moderator – Lorraine Los, UConn Plant Science & Landscape Architecture

- 1:15            High Tunnels: Strategies for Long Term Tomato Production - Steve Groff, Cedar Meadows Farm, Holtwood, PA
- 1:45            Winter Moth: a New Destructive Blueberry Pest – Heather Faubert, URI Extension
- 2:15            Mixed Vegetable Production on Stone Garden Farms – Fred & Stacia Monahan, Stone Garden Farms, Shelton, CT
- 2:45            Moving to Deep Zone Tillage – Jude Boucher, UConn Extension
- 3:15            Re-certification Credits: 3.5 hours

**Directions:** Take Exit 67 off I-84. Take Route 31 north to junction of Route 30 at first traffic light. Turn right on to Route 30. Tolland County Ag Center is on right just after Rockville Savings Bank. Contact: Jude Boucher 860 875-3331.

*The University of Connecticut is an equal opportunity program provider and employer. Please call three weeks prior to this event if special accommodations are needed.*



### Crop Talk Editors/Contributors

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University of Connecticut  
Dept of Extension  
24 Hyde Avenue  
Vernon, CT 06066