

and achieve

good long term storage.





Fluctuations in tuber temps may reduce storage life and potato quality and lead to the development of condensation.

How can you avoid this?

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Fall weed control in garlic was evaluated in a 2013 Cornell Research Trial. Read the trial



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State and federal programs exist for producers who are committed to a soil health conservation

strategy. Act now to be eligible for assistance in 2015!

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# Storage of Squash

Robert Hadad, CCE Cornell Vegetable Program

Good long term storage of winter squash and pie pumpkins start with clean fruit that are free from cuts or abrasions and a thorough curing process.

Since squash fruit are alive despite being picked from the field and held in storage, special care is needed. Respiration needs to be slowed down and storage disease prevention is necessary. Cold storage will reduce respiration rates. A reduction in temperature by about 20°F will reduce respiration by 50%. Care is needed, however to not cause chilling injury. Squash and pumpkins are best kept around 55°F. Unlike root crops or greens, humidity levels can be kept lower to 70-75%.

Curing hardens the skins of the fruit which will help prolong storage. Curing is best accomplished by trying to keep the squash at 80 to 85°F for 10 days with a relative humidity close to 85%. Keep the squash out of the night dew. Keep in a barn with a heater and fan, in a greenhouse with fan and adequate ventilation to keep temperatures from getting too high, or in a high tunnel. Weather is the key factor. Acorn squash do not need to be cured.



Photo: Robert Hadad, Cornell Vegetable Program



VegEdge newsletter is exclusively for enrollees in the Cornell Vegetable Program, a Cornell Cooperative Extension regional agriculture team, serving 11 counties in Western New York.

The newsletter is a service to our enrollees and is intended for educational purposes, strengthening the relationship between our enrollees, the Cornell Vegetable Program team, and Cornell University.

We're interested in your comments. Contact us at: CCE Cornell Vegetable Program 480 North Main Street, Canandaigua, NY 14224 Email: cce-cvp@cornell.edu

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### Cornell University **Cooperative Extension**

Cornell Vegetable Program

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The next issue of VegEdge will be produced on November 1, 2014.



One of the many CVP-led research projects: Collecting data on the carrot weed management trial in the Potter muck this week Photo: Julie Kikkert, Cornell Vegetable Program

Thin skinned squash like dumpling, carnival, or delicata are not truly winter storage types. They start to dry out in December or early January. Butternut, hubbards, kobochas, and pie pumpkins can be stored under ideal conditions well into March or beyond. I had several pie pumpkins and hubbard squash last into the beginning of August this year being picked in early October 2013.

Diseases common in storage squash are *Fusarium*, *Alternaria*, *Pythium*, anthracnose, erwinia, and gummy stem blight. 
 Table 1. Recommended optimum storage conditions for pumpkins and winter squashes.

 From NCSU Fact Sheet: Storing Winter Squash and Pumpkins by Schultheis and Averre 1995.

Туре	Relative Humidity	Temperature Conditions	Approx. Length of Storage	Remarks
Pumpkins	50 to 75%	50 to 55⁰F	2 to 3 months	Fruit should be mature. Don't store with apples.
Hubbards	70 to 75%	50 to 55°F	5 to 6 months	Stores well.
Acorn	50 to 75%	50°F	5 to 8 weeks	At temperatures >55°F, surface becomes yellow and flesh becomes stringy.
Butternut or Buttercups	50 to 75%	50°F	2 to 3 months	Degree of maturity not as important as for other types.

Steps to Minimize Squash and Pumpkin Rots. From NCSU Fact Sheet: Storing Winter Squash and Pumpkins by Schultheis and Averre 1995.

- 1. Maintain a good fungicide- and insecticide-spray program during the growing season to minimize foliar diseases (leaf spots and blights and insect problems.
- 2. Avoid blossom-end rot of fruit by fertilizing and liming fields according to recommendations from soil test reports and by irrigating when needed.
- 3. Avoid injuring fruit while on the vine.
- 4. Harvest fruits when they are mature and the rind is hard, but before night temperatures are below 40°F and well before a frost or a hard freeze.
- 5. Do not harvest or handle wet fruit. Do not let harvested fruit get wet.
- 6. Harvest fruit by cutting the peduncle (stem) with pruning shears to leave a 3- to 4-inch handle for pumpkins and about a 1-inch stump for squash.
- 7. Harvest, pack, handle, and store fruit carefully to avoid injuries.
- 8. Discard all fruit that are immature, injured, or have rot or blemishes. These fruit should not be harvested or stored.
- 9. Do not pick up freshly harvested fruit by the peduncle, because it may separate from the fruit and provide easy access for rot organisms.
- 10. Do not stack the fruit higher than 3 ft.
- 11. Do not permit harvested or stored fruit to get wet.
- 12. Washing is usually not desirable, but if washing is necessary, be sure the water is chlorinated (at least 50 ppm, approximately one part 5.25% liquid bleach to 999 parts water). Prepare fresh wash solution when the water becomes cloudy and chlorine cannot be detected. Dry thoroughly.
- 13. For better keeping, some growers cure pumpkins for 10 to 20 days at 80 to 85°F with good ventilation (e.g. four air exchanges per day).
- 14. Harvested fruit should be stored with good ventilation (at least one air exchange per day) at 50 to 55°F and 50 to 75% relative humidity. Standard refrigeration temperatures (35 to 45°F) may cause chilling injuries and shorten shelf life. Storage at high temperature may result in excessive loss of weight, color, and culinary qualities, while high humidity may promote rots.
- 15. Storage life is typically 2 to 3 months without significant loss in quality. O

# Late Season Potato Notes and Storage Management

Carol MacNeil, CCE Cornell Vegetable Program

Conditions have continued to be favorable for the development of <u>late blight</u> (<u>LB</u>) across the CVP area, with a 5-7 day fungicide spray interval still recommended at all locations. If there are any green leaves or stems continue to apply a fungicide. Copper is effective when little foliage remains. Check shallow tubers for the dark, dry lesions of late blight. Wait 2 – 3 weeks after the last vine-killing to be sure foliage is completely dead before harvest, to avoid contact with LB spores.

If LB, pink rot (PR) or bacterial soft rot

(BSR) are present in fields plan to sell those lots as quickly as possible. If you need to hold them cool them down as quickly as possible if you can keep them cool, and maintain continuously high air flow/re-circulation. Temperatures at or below 45°F limit the devel-

continued on page 4

opment of LB and other diseases. Fluctuating temperatures, however, result in condensation on tubers which promotes disease spread.

For your sound potatoes, immediately after curing, tubers should be slowly cooled down to the holding temperature. A rapid reduction in storage temperature, followed by a warm spell, will cause fluctuation in tuber temperatures. Temperature fluctuations may reduce storage life and potato quality, in addition to the development of condensation. Cool a maximum of  $4 - 5^{\circ}F$  per week. Use a pulp thermometer (one with a stem to poke into the center of a tuber) to check tuber temperatures. Potatoes should be cooled with air no lower than  $3 - 5^{\circ}F$  below the tuber temperature. When night temperatures are warm in the fall, and growers aren't ventilating, tuber temperatures can rise above 50°F. This is because tubers are alive and they respire, taking in oxygen and releasing carbon dioxide, and heat! Be sure to monitor tuber pulp temperatures at all levels, and in the center and corners of the storage, frequently in the fall. Exhaust warm air from the top of the storage, and ventilate with cooler outside air whenever it's available. This will also get rid of excess carbon dioxide and bring in oxygen.

Once the holding temperature is reached continue to re-circulate air within the storage a few times a day for up to an hour to maintain uniform temperatures and relative humidity throughout. Also, even though outside temperatures may be cold, ventilate the storage occasionally for short periods to exhaust excess humidity and carbon dioxide. Mix outside air with inside air in a plenum to avoid freezing any tubers.

Finally, do not produce cull piles of tubers which may have LB. Such piles are a significant source of spores. The centers of large piles generally do not freeze over-winter. Culls should be spread thinly on fields not intended for potato production the following year, in time that they will freeze completely Potato culls can also be destroyed by proper composting, deep (2 ft) burial, or feeding to livestock.

# Second Comment Period Open on Federal Rules for Food Safety Modernization Act Through December 13, 2014

*Edited by D. Telenko, CVP; more information available on <u>http://producesafetyalliance.cornell.edu/</u> or <u>http://</u> <u>www.fda.gov/Food/GuidanceRegulation/FSMA/default.htm</u>)* 

Based on the large number of public comments and outreach efforts after the first open comment period, the FDA has released proposed revisions to the Produce Rule that are more flexible and less burdensome in a few key areas. Revisions were made to the water quality standards and testing requirements, manure and compost requirements, the definition of a 'covered' farm, withdrawal of qualified exemptions, and provisions related to wildlife.

# **Summary of Key Revisions**

# 1. Water quality standard and testing more flexible

- The FDA is proposing various revisions to the microbial standard for water that is directly applied during the growing of produce (other than sprouts). The agency is updating the microbial quality standard to reflect data that supports the 2012 Environmental Protection Agency recreational water quality criteria.
- Farmers with agricultural water that does not initially meet the proposed microbial standard would have additional means by which they could meet the standard and then be able to use the water. These options include establishing a sufficient interval of days between last irrigation and harvest to allow time for potentially dangerous microbes to die off. They could also apply an interval of days between harvest and the end of storage using appropriate microbial die-off or removal rates, provided there is adequate supporting data. And there is an option to calculate and apply appropriate pathogen removal rates for activities such as commercial washing.
  - A number of commenters felt that the FDA should allow for microbial die-off that occurs naturally in the field before the crop is harvested. This provision provides that flexibility. However, any of these options would have to provide the same level of public health protection and not increase the likelihood that the covered produce will be adulterated.
- Recognizing that water sources have different levels of contamination risk, the FDA is proposing a tiered and more targeted
  approach to testing each source of untreated water that will be less burdensome on farmers while still protective of public
  health. The revisions reduce how often the water is tested, with the frequency depending on the water source (i.e. surface
  or ground water) and on the results of prior tests.

# 2. Manure strategy to be further studied

- The FDA is removing the nine-month proposed minimum-time interval between the application of untreated biological soil amendments of animal origin (including raw manure) and crop harvesting. The agency is deferring its decision on an appropriate time interval until it pursues certain actions. These include conducting a risk assessment and extensive research to strengthen scientific support for any future proposal, working with the U.S. Department of Agriculture and other stakeholders.
- At this time, the FDA does not intend to take exception to farmers complying with the USDA's National Organic Program

**standards**, which call for a 120-day interval between the application of raw manure for crops in contact with the soil and 90 days for crops not in contact with the soil.

• The FDA is proposing to eliminate the previously proposed 45-day minimum application interval for compost (also known as humus), including composted manures. Properly treated and handled compost is safer than raw manure from a public health standpoint and this change to the proposal would help facilitate its use while still providing an appropriate level of public health protection.

### 3. Covered farms better defined

- The FDA is proposing that farms or farm mixed-type facilities with an average annual monetary value of produce sales of \$25,000 or less will not be covered. The original proposed rule defined that monetary threshold in terms of all food sales. The FDA is also proposing corresponding changes to the definitions of "very small business" and "small business" to base those monetary thresholds on produce sales rather than food sales. The monetary threshold for the qualified exemption with modified requirements, however, would not change because that exemption is defined by statute.
- The definition of "farm" would be revised; a farm would no longer be required to register as a food facility merely because it packs or holds raw agricultural commodities grown on another farm under a different ownership. The FDA is proposing that such activities would be subject to the produce safety rule rather than the preventive controls rule for human food.

### 4. Withdrawal of qualified exemptions process further clarified

- The proposed revisions would establish **procedures to guide the FDA in withdrawing an exemption** for a farm for food safety reasons as specified in the proposed regulation:
  - The FDA may consider one or more other actions to protect public health prior to withdrawal, such as a warning letter, recall, administrative detention, or seizure and injunction.
  - The FDA must notify the farm of the circumstances that jeopardize the exemption, provide an opportunity for the farm to respond, and consider actions taken by the farm to address the issues raised by the agency.
- The revisions also provide procedures for reinstating a withdrawn exemption.

### 5. Clarifying provisions on wild animals

• The FDA states in the proposed revisions that the proposed produce regulation does not authorize or require farms to take actions that would constitute the "taking" of a threatened or endangered species in violation of the Endangered Species Act. There were concerns expressed that growers would interpret the original proposed rule in ways that would harm wild-life, including taking measures to exclude animals from outdoor growing areas or destroying animal habitats. This clarification is intended to relieve those concerns.

# 6. Compliance Dates

- Very small businesses, those with more than \$25,000 but no more than \$250,000 in annual produce sales, would have four years after the rule's effective date to comply with most provisions.
- Small businesses, those with more than \$250,000
   but no more than \$500,000 in produce sales, would have three years after the rule's effective date to comply with most provisions.
- All other farms would have two years after the effective date to comply with most provisions.
- The compliance dates for water quality standards, and related testing and recordkeeping provisions would be an additional two years beyond the compliance dates for the rest of the final rule.

The proactive response by the public on the initial comment period initiated the above revisions; further public involvement will be needed if there are still areas of concern with the implementation of the Food Safety Modernization Act.

### What can you do?

- Review the law full text of the law can be found <u>http://</u> www.fda.gov/Food/GuidanceRegulation/FSMA/ ucm247548.htm\
- Review the guidance and rules <u>http://www.fda.gov/Food/</u> <u>GuidanceRegulation/FSMA/ucm334115.htm</u>
- Comment on items and rules that may affect your farm- to comment go to the following website <u>http://www.fda.gov/ Food/GuidanceRegulation/FSMA/ucm334114.htm</u> and in the right column is a Comment Now! link. It takes you to an area where you can directly comment on the rules and regulations and how they might affect your farm.
- Handwritten comments can be mailed to: Division of Dockets Management (HFA-305) Food and Drug Administration 5630 Fishers Lane, Rm. 1061, Rockville, MD 20852
- The comment period opened on Monday, September 29, 2014 and the FDA will accept comments for 75 days after the publication date, until December 13, 2014.

# Fall Weed Control in Garlic Featuring 2013 Cornell Trial Results

Christy Hoepting, CCE Cornell Vegetable Program

Chateau and Prowl may be applied in the fall after planting garlic prior to emergence of garlic for pre-emergent broad spectrum control of broadleaf weeds and selected annual grasses. Also, Prowl, Outlook and Dual Magnum may be applied in the fall <u>if</u> garlic has emerged and has 1-2 leaves for management of annual grasses and selected broadleaf weeds.

In 2013, Chateau 6 oz and Prowl  $H_2O$  2 pts were applied 3 days after elephant garlic was planted prior to emergence of garlic and weeds on October 22, 2012 for pre-emergent weed control. Outlook 21 fl oz and Dual Magnum 1.33 pts were applied both alone and following Chateau 6 oz (applied on Oct 22) 6 weeks later on December 3, 2012. Although the label for these products states that garlic has a minimum of 2 true leaves for Outlook and Dual Magnum, the garlic had not yet emerged in this trial. Thus, we evaluated an off-label pre-emergent to

garlic use at a late fall timing for weed control and crop tolerance. In the spring, Prowl H<sub>2</sub>O 2 pts and Outlook 21 fl oz were applied when the garlic had 2-3 leaves on April 9, 2013. At that time, mustard seedlings ranged from cotyledon to 6-8-leaf stage (2-3 inch diameter). Dual Magnum 1.33 pts was applied at this timing and was followed up with Goal 2 XL 4 fl oz on April 23, 2013 when the garlic had 5 leaves for POSTemergent broadleaf weed control. Similarly, Goal 2 XL 4 fl oz, Buctril 2 pts, Select Max 16 fl oz and Goal + Select Max were also applied on April 23<sup>rd</sup> (Table 1). The weed species in this trial included mostly annual bluegrass, some quack grass and yellow nutsedge, a few mustard species dominated by yellow rocket and some patches of purple dead nettle.

Fall App Results Summary (Table 1): In this trial, best weed control was achieved with Chateau 6 oz + Dual Magnum 1.33 pts applied in the fall. Chateau provided excellent control of broadleaf weeds and annual grasses and even appeared to suppress yellow nutsedge. None of the treatments evaluated in this trial controlled quack grass. Addition of a grass herbicide (Prowl and Dual Magnum were trialed) to Chateau improved annual grass control slightly. For grass control, fall applications of Prowl and Outlook provided very good to excellent control of annual bluegrass, and performed slightly better than Dual Magnum. All of these products reduced the density and delayed emergence of the new flush of broadleaf weeds in the spring. Dual Magnum notably controlled purple deadnettle. Grass control of Dual Magnum and Outlook was similar when applied in the fall or spring; however, grass control (and broadleaf weed control) was much improved when Prowl was applied in the fall compared to the spring. Broadleaf

Table 1. Efficacy and crop safety of selected herbicides for weed control in elephant garlic. Field trial: Holley, NY (Hoepting, 2012-2013).

Treatment and Timing		% weed control (April 30)		Crop Safety	
Herbicide and Rate (per acre)	Timing	Broadleaves <sup>2</sup>	Grasses <sup>3</sup>	(scale 0-10) <sup>4</sup> (April 30)	Comments
Untreated		0	0	8.5	Stunting in some wet spots
Fall Applications:				•	
Prowl H <sub>2</sub> O 2 pts	PRE garlic, PRE weeds (3 days post plant) – Oct 22	27.5	80	7.3	Minor stunting, tip nipped; reduced density & delayed emergence of 1 <sup>st</sup> broadleaf flush
Chateau 6 oz	PRE garlic, PRE weeds (3 days post plant) – Oct 22	91	85	8	Longest lasting residual and broad spectrum control
Prowl H <sub>2</sub> O 2 pts + Chateau 6 oz	PRE garlic, PRE weeds (3 days post plant) – Oct 22 Same	89	94	8.3	
Outlook 21 fl oz	POST garlic (1-5 lvs) <sup>1</sup> , PRE weeds – Dec 9	20	77.5	8.9	
Dual Magnum 1.33 pt	POST garlic (1-5 lvs) <sup>1</sup> , PRE weeds – Dec 9	30	70	8.8	Controls purple deadnettle
Chateau 6 oz + Dual Magnum 1.33 pt	PRE garlic, PRE weeds (3 days post plant) – Oct 22 POST garlic $(1-5 \text{ lvs})^1$ , PRE weeds – Dec 9	91.3	96.3	9.25	Best treatment
Spring Applications:					
Outlook 21 fl oz	POST garlic (2-3 lvs), PRE weeds – Apr 9	62	77.5	9.7	Excellent control of young flush; pepperweed not con- trolled
Prowl H <sub>2</sub> O 2 pts	POST garlic (2-3 lvs), PRE weeds – Apr 9	10	30	8.5	No control of emerged grasses
Dual Magnum 1.33 pt + Goal 2XL 4 fl oz	POST garlic (2-3 lvs), PRE weeds – Apr 9 POST garlic (5 lf), POST weeds – Apr 23	70	75	4.75	Poor control of large weeds, burned garlic
Goal 2XL 4 fl oz	POST garlic (5 lf), POST weeds – Apr 23	83	16	6	Burned garlic, excellent control of young broadleaf flush
Buctril 2 pts	POST garlic (5 lf), POST weeds – Apr 23	91	0	8.2	Best control of large broad- leaves including deadnettle
Select Max 16 fl oz + NIS 0.25% v/v	POST garlic (5 lf), POST weeds – Apr 23 same	6	15	9.3	
Select Max 16 fl oz + NIS 0.25% v/v + Goal 2XL 4 fl oz	POST garlic (5 lf), POST weeds – Apr 23 Same same	76	70	5.4	Burned garlic; synergy for grass control

<sup>1</sup>Garlic had not yet emerged, but timing was included as if it had emerged in order to evaluate weed control. <sup>2</sup>Dominant species of broadleaf weeds included mostly mustards, especially yellow rocket and some patches of purple dead nettle. <sup>3</sup>Dominant species of grass was annual bluegrass with some quack grass and yellow nutsedge (technically not a grass). No treatments controlled quack grass. <sup>4</sup>Crop Tolerance Rating Scale 0-10: 0 = crop is dead; 5 = crop is half dead; 10 = crop is unharmed & healthy.

weed control was improved when Outlook and Dual Magnum were applied in the spring compared to the fall. The only one of these treatments that had moderate crop injury was when Prowl was applied in the fall preemergent to the elephant garlic.

Spring App Results Summary (Table 1): In the spring applications, Outlook performed slightly better than Dual Magnum and Prowl for control of annual grasses, yellow nutsedge and selected broadleaf weeds and for crop safety, although Dual Magnum also looked very good (not all data shown). Any weeds that had already emerged at the time of application were not controlled, however. For improved control, these products could be applied following cultivation to eliminate emerged weeds. In this trial, Buctril performed much better than Goal for post-emergent broadleaf weed control and crop safety, while Select Max 16 fl oz was poor on annual blue grass when used alone. Goal 2XL caused unacceptable injury to elephant garlic. Grass control was improved tremendously when Select Max was tank mixed with Goal 2XL, which also cleaned up emerged broadleaf weeds. Unfortunately, this combination also resulted in unacceptable injury to the elephant garlic. In general, grasses were controlled better with the pre-emergent herbicides.

### **RECOMMENDATIONS:**

No herbicide treatment provided better weed control than cultivation. Herbicides can be used in garlic to generally reduce weed pressure and/or to substitute for cultivation within the plant rows. Unfortunately, very long preharvest entry intervals currently limit the usefulness of some of these herbicides in the spring and summer. Unfortunately, Buctril has a 112 day PHI. Re-growth of weeds following cultivation in our trial was notably reduced where the weeds had been managed with herbicides.

- Apply Chateau 6 oz 3 days after planting garlic in the fall for broad spectrum broadleaf weed and some annual grass control.
- 2) In the spring after cultivation and nitrogen side-dress, apply Outlook 21 fl oz (or Dual Magnum 1.33 pts) once onions have at least 2 leaves for pre-emergent annual grass and yellow nutsedge control. May be used up until mid-June for Outlook and mid-May for Dual Magnum for mid-July harvest.

Note: This program does not control perennial weeds!

### PRE-emergent to garlic and weeds:

**Chateau SW:** a.i. flumioxazin. For control of broadleaves including mustards, chickweed, nightshades, and some annual grasses. Apply within 3 days after planting garlic.

**Rates:** Apply up to 6 oz/acre. Do not apply more than 6 oz/acre during a single growing season.

**In 2013 Cornell trial:** Chateau had the longest residual activity of the herbicides trialed. A fall application could go a long way towards reducing the density and delaying the development of broadleaf and selected grass weeds as part of an integrated weed management approach with cultivation. Use in combination with a spring-applied pre-emergence grass herbicide (Outlook or Dual Magnum) further improves annual weed control.

**Prowl 3.3EC\* and Prowl H**<sub>2</sub>**O:** a.i. pendimethalin. For control of annual grasses, some broadleaves like pigweed, Shepherd's purse, chickweed, suppression of nightshades, Lamb's quarters and velvet leaf. May be applied PRE-emergent to garlic prior to its emergence or POST-emergent to garlic when it has <u>1-5 true</u> <u>leaves</u>, or in a split application of PRE and POST timings. Adjust rates according to soil type. **PHI:** 45 days (end of May for a mid-July harvest). **\*Note:** Prowl 3.3EC is also available in generics, such as **Pendant 3.3EC** and **Stealth**.

**In 2013 Cornell trial:** Prowl  $H_2O$  2 pts provided very good control of grasses except quack grass. No control of yellow nutsedge or ragweed. Control of mustard species was variable. Saw minor stunting and yellowing of elephant garlic when applied in the fall. Weed control was much improved when Prowl was applied in the fall compared to the spring. Complimentary with Chateau applied in the fall.

### POST-emergent to garlic and weeds:

**Outlook:** a.i. dimethenamid-P. For control of annual grasses, yellow nutsedge, some broadleaves like pigweed, Shepherd's purse and chickweed, suppression of nightshades. Garlic needs to have at least <u>2 leaves</u>. Adjust rates according to soil type. May be applied as a single or split application 14 days apart. Weed control not as good when soil is dry. **Caution:** Stunting is more likely to occur when soil is cold and wet, use lower rates. **PHI:** 30 days (mid-June for a mid-July harvest). **In 2013 Cornell trial:** Outlook 21 fl oz provided very good control of grasses, except quack grass, yellow nutsedge and yellow rocket, control of wild mustard was good and poor on field pepper weed and ragweed. Elephant garlic had excellent tolerance. In this trial, Outlook performed slightly better than Prowl H<sub>2</sub>O and Dual Magnum when applied in both the spring and fall. Broadleaf weed control was improved when applied in the spring compared to the fall; no difference with grass control. Complimentary with Chateau applied in the fall.

**Dual Magnum 24(c) Special Local Needs Label:** a.i. metalochlor. For control of annual grasses, yellow nutsedge, some broadleaves like pigweed, Hairy galing-soga, Shepherd's purse and nightshades. Garlic needs to have at least <u>2 leaves</u>. Adjust rates according to soil type. May be applied as a band application. **Caution:** Risk of injury is greater on lighter textured soils and with higher application rates. \*Due to the risk of crop damage, all such use is at the end user/grower's risk and requires users to sign a waiver which releases Syngenta Crop Protection, Inc. from all liability. **PHI:** 60 days (mid-May for a mid-July harvest).

In 2013 Cornell trial: Dual Magnum 1.33 pts provided very good control of yellow nutsedge and grasses, except quack grass. It suppressed some species of brassica weeds, but was weak on yellow rocket and also ragweed. Crop tolerance of elephant garlic was very good. Broadleaf weed control was improved when applied in the spring compared to the fall; no difference with grass control. Complimentary with Chateau applied in the fall.

**Prowl 3.3EC\* and Prowl H<sub>2</sub>O:** May be applied PRE-emergent to garlic prior to its emergence or POST-emergent to garlic when it has 1-5 true leaves, or in a split application of PRE and POST timings.

# State & Federal Program Opportunities to Improve Soil Health for Vegetable Producers

Greg Albrecht, Ag Environmental Management (AEM), NYS Dept. of Ag & Markets, and Dale Gates, USDA Natural Resources Conservation Service (NRCS)

(New funding opportunities are available to assist growers in adoption of reduced tillage and cover cropping practices. Contact NRCS at your local USDA Service Center, &/or county Soil & Water Conservation District staff **as soon as possible**, to be eligible for assistance in 2015. ed. C. MacNeil, CVP)

Improving soil health is the right thing to do for both production and conservation. Moving to a higher level of soil health under intensive vegetable production can be a challenge from both a financial and logistical standpoint, but growers may already be implementing practices toward the goal. An effective soil health strategy is based on the following concepts:

- feeding and diversifying soil organisms through a wider range of crops in rotation and organic matter inputs,
- managing more by disturbing the soil less,
- growing a living root year-round, and
- keeping the soil covered as much as possible.

Further improvement of soil health over time can lead to higher yields, improved product quality, soils more resilient to droughty and wet conditions (weather extremes), reduced pest pressure, improved nutrient recycling, and reduced outside inputs. Producers who have a plan in mind for improving their soil health, and are committed to moving to a higher level, may be at a point where putting a soil health conservation system on the ground aligns well with state and federal program opportunities.

The objective of an effective soil health strategy is to first determine where the weak links are in the current cropping system. Determination of a soil health resource concern may be in the form of visual soil indicators, less than optimum yields, high input cost, soil test results, and/or soil health modeling. Identifying the correct practices, and the extent and technical specifications of each practice needed for success is the next step. Determining a point where each practice can be inserted into a current system in order to be effective and still maintain a producer's objective for crop timing and yield can be challenging especially for vegetable producers. An effective soil health strategy requires increased management and may involve short term increases in labor and equipment cost while fine-tuning the best system. Federal and state/local cost-share programs can significantly help offset some of these upfront costs. Technical Assistance for soil health planning and implementation is always available from local conservation professionals including local <u>Natural Resources Conservation Service (NRCS), Soil and Water Conservation District (SWCD), Cornell Cooperative Extension (CCE), and private <u>Technical Service Providers (TSPs)</u>. It is critical that conservation professionals work with you to get the technical and timing aspects right for the practices needed for a comprehensive, working, soil health management system. Once the technical components of a soil health system are planned, determining if implementation may fit into a cost-share program can be explored.</u>

Common Conservation Practices Available to Build Soil Health Systems			
Practice	General Technical Requirements	Soil Health Strategy Achieved	
Conservation Crop Rotation (328)	Introduction of a new resource con- serving crop into the crop rotation. Close grown crops such as small grains qualify.	Increase diversity in the soil biosphere, increase soil cover, allows for in- creased flexibility to insert diverse cover crops into the over-all system.	
Cover Crop (340)	Planting living cover during non- cropped periods of the crop year. Cover crops can be planted for fall, winter, spring, and summer periods. Follow specified seeding rates and planting dates depending on season and type of cover crop planned.	Provide living cover, living roots 24/7. Increase level of soil organic matter, bio-diversity, energy transfer to soil microbes, and nutrient recycling.	
Residue and Tillage Manage- ment, No-Till/Strip Till/Direct Seed (329)	Change tillage methods from a full width system to one or two pass systems that leave at least 40% of the surface un-tilled.	Decrease soil disturbance, increase residue cover and soil organic matter.	
Residue and Tillage Manage- ment, Mulch Till (345)	Change tillage methods from full width high disturbance inversion types to lower disturbance full width tillage such as vertical tillage and low dis- turbance chisels and disks. Generally requires a higher residue crop to gain benefits.	Decrease soil disturbance, increase residue cover and soil organic matter.	
Nutrient Manage- ment (590)	Apply all plant nutrients and soil amendments according to the 4R concept (right place, right time, right rate, and right form). Requires quali- fied professional to develop the man- agement plan. Producers needs to document nutrient applications with record keeping.	Increases nutrient cycling efficiency and increases plant condition. Recy- cles carbon and nutrients from ma- nures and composts. Healthy crops lead to healthy soils.	
Integrated Pest Management (595)	Use of prevention, avoidance, and mitigation techniques before making pest suppression decisions. Pest scouting and detailed record keeping required.	Increases plant condition. Healthy crops lead to healthy soils. Minimizes impact to soil microbes from pesticides.	
Irrigation Water Management (449)	Scheduling of irrigation water in asso- ciation with micro-irrigation systems. Water is applied based on plant needs and soil moisture status. Re- quires development of a plan and detailed record keeping	Reduces irrigation-induced soil erosion and negative impacts on soil structure by over application of irrigation water.	

Whether working with NRCS, a SWCD, CCE, and/or a private-sector TSP, there are a host of practices that can be used on their own, or more often and better yet, together to improve soil health. The table, left, outlines several of the common practices, often used together to achieve an effective, long-term strategy for soil health.

### Federal Program Opportunities:

The Environmental Quality Incentive <u>Program (EQIP)</u> offered through the NRCS provides significant funding opportunities for soil health practices listed in the table above. EQIP offers payment for implementation of new practices on eligible cropland to address an existing, documented resource concern such as degraded soil health and high erosion rates. Applications are ranked according to the magnitude of the resource concern addressed in a conservation plan. Multiple practices implemented as a system tend to be more effective and rank higher. Payment rates vary depending on the practices to be implemented. For example, implementation of a Cover Crop practice could result in a payment applied to cost anywhere from around \$60/acre to \$100/acre under the 2014 EQIP program. Higher payments are for more complex, higher cost cover crop mixes and where organic seed is required. Payments for implementation of reduced tillage practices range from about \$13/acre to \$16/acre in payments that are applied towards implementation costs. Payments for the cost of implementing a new Conservation Crop Rotation may be in the range of \$14/acre to \$54/acre, again with higher payments for implementation of higher cost systems. Final payment rates for all practices are determined by the resource concerns identified and addressed through the conservation plan. Growers can sign up for EQIP on a continuous basis through NRCS at their local USDA Service Center. In order to qualify for the 2015 crop year, EQIP applications will need to be submitted as soon as possible to meet a funding sign-up deadline sometime in early November.

The Conservation Stewardship Program (CSP) is another Federal funding opportunity administered by NRCS. Land that is cropped annually is eligible, as well as land set aside for natural resource management. CSP offers payments where existing high levels of soil health and other natural resource stewardship can be demonstrated. For CSP, many soil health practices have largely been implemented through a conservation plan in the past and are maintained on the cropland landscape. CSP applications are processed through a conservation measurement tool (CMT). If a grower is meeting a certain stewardship threshold and is willing to enhance certain practices on their farm with increased management intensity, they could be eligible for a lump sum yearly payment under CSP. The CSP payment is designed to assist with up-front operation and maintenance cost associated with maintaining conservation management systems on farms. Farms that have addressed resource concerns in the past through EQIP, state programs, or on their own with conservation management systems and are maintaining those systems may fit well into the CSP program. CSP applications are also taken on a continuous basis by NRCS at USDA Service Centers. Sign up as soon as possible in order to be considered for the next funding cycle.

For more info on federal program opportunities to address soil health and other conservation objectives, visit: <u>http://www.nrcs.usda.gov/wps/portal/nrcs/site/ny/home/</u> Click on *Get Started with NRCS* to review the process of getting financial assistance for good soil management. For the location of the nearest NRCS office go to: <u>http://offices.sc.egov.usda.gov/locator/app?state=NY</u>

### State and Local Program Opportunities:

Through their local <u>Agricultural Environmental Management (AEM)</u> programming and with support from the NYS Department of Agriculture and Markets and the NYS Soil and Water Conservation Committee, county-based <u>Soil and Water Con-</u> <u>servation Districts (SWCD)</u> offer technical assistance and cost-share opportunities for a wide-range of conservation practice systems, including those beneficial for soil health. The approach is centered on conserving natural resources in concert with the goals of farm businesses. Taking a stepwise approach, conservation professionals from your local District can help with:

- assessing existing stewardship and opportunities for improvement (Tiers 1 and 2),
- planning conservation systems to improve soil health, conserve soil, and benefit water quality (Tier 3),
- implementing those practice systems (Tier 4), and
- evaluating their performance over time (Tier 5).

Connecting with your local SWCD is the best way to discuss specifics about AEM, technical assistance, cost-share opportunities (such as through the NYS Agricultural Nonpoint Source Abatement and Control Grants Program), and next steps. **Contact your local SWCD as soon as possible to be eligible for 2015 cost-share opportunities**. Contact info for District offices can be found at: www.agriculture.ny.gov/SoilWater/contacts/county\_offices.html

# **UPCOMING EVENTS**

# Organic Disease Management in (Another) Wet Year

October 21, 2014 | 10:00 AM – 3:00 PM Jordan Hall Auditorium, 614 W North St, Geneva, NY 14456

This intensive workshop will discuss some of the worst disease challenges in 2014 as well as the strategies that had the most impact controlling them. Presented by Cornell Vegetable IPM Coordinator Abby Seaman and Cornell Plant Pathologists Chris Smart and Sarah Pethybridge. For details go to: <u>http://www.nofany.org/events/field-days</u>. Registration: \$25 pp - To pre-register and pay online go to: <u>http://www.nofany.org/events/register</u> or call Stephanie at 585-271-1979 x509.

Sponsored by a NOFA-NY NYSDAM Specialty Crop Block Grant.

# Organic Brassica School

October 30, 2014 | 1:00 PM – 5:00 PM Bejo Seeds, 1088 Healey Rd, Geneva, NY 14456

Learn about selecting varieties and managing brassica crops to reduce disease and insect pressure. Get details on monitoring and organic controls for flea beetles, Swede midge, cabbage worms, black rot, and more. Farmers are welcome to check out Bejo's late fall plantings and demonstration gardens. Presented by Jan van der Heide of Bejo Seeds, Cornell Vegetable IPM Coordinator Abby Seaman, Cornell Plant Pathologist Chris Smart, and Cornell Horticulturist Thomas Bjorkman. For details go to: <u>http://www.nofany.org/events/field-days</u>. Registration: \$10 pp or \$15/group - To pre-register and pay online go to: <u>http://www.nofany.org/events/register</u> or call Stephanie at 585-271-1979 x509.

Sponsored by a NOFA-NY NYSDAM Specialty Crop Block Grant.

# Cover Crop Workshop and Field Tour

November 14, 2014 | 9:15 AM – 3:30 PM USDA NRCS Big Flats Plant Materials Center (PMC)\*, 3266 Rte 352, Big Flats, NY 14814

View 250 different plots of cover crops, combinations and planting dates in the field, then hear the latest on cover crops from growers, and university/agency specialists. 1 DEC pesticide credits; 4 CCA credits. Cost: \$12. Pre-registration and agenda at <a href="http://events.constantcontact.com/register/event?llr=fzz4ttqab&oeidk=a07e9ixnnn9a7d33a5c">http://events.constantcontact.com/register/event?llr=fzz4ttqab&oeidk=a07e9ixnnn9a7d33a5c</a> or call Paul Salon at 607-562-8404.

\*Take Route 17 (I 86) to Exit 48 (East Corning/Route 352). Follow Route 352 east for 1.5 miles. PMC entrance is on the left.

# National Onion Association (NOA) and National Allium Research Conference (NARC) Annual Meetings followed by the W2008 Regional Research & Extension Committee Meeting

December 3-6, 2014 Scottsdale, Arizona

The National Onion Association (NOA) and National Allium Research Conference (NARC) Annual Meetings will be held in conjunction for the first time at Scottsdale, Arizona during December 3 – 5, followed by the *W2008* Regional Research and Extension Committee meeting on December 6. Check it out!

- Registration for NARC, NOA & W2008 is being handled by the NOA, and the following link provides information on these exciting
  meetings and great value: <u>http://onions-usa.org/members/noaconventions</u>
- Hotel reservations can be made by contacting the Scottsdale Research & Conference Center: <u>http://</u><u>www.alliumnet.com/2014NARCAccommodations.htm</u>

# 2014 Agribusiness Economic Outlook Conference

### December 9, 2014 Cornell University, Warren Hall, Ithaca, NY 14853

New York agricultural leaders (industry leaders, agribusiness professionals, policymakers, educators, and farm managers) learn about the short-and long-term outlook for agriculture and agricultural products in New York and the Northeast. Breakout sessions will provide the near-term outlook for major New York commodities including dairy, grains and feed, and horticultural products. For more information, contact Gretchen Gilbert at 607-254-1281 or gcg4@cornell.edu.

# Processing Sweet Corn and Snap/Lima Bean Advisory Meeting

### December 17, 2014 Ramada Inn, Geneva, NY 14456

More details to follow. Contact Julie Kikkert at <u>irk2@cornell.edu</u> with questions.









# Fall is a Great Time to Soil Test and Lime

Carol MacNeil, CCE Cornell Vegetable Program (info from S. Menasha, CCE Suffolk Co., and the 2014 Cornell Vegetable Guidelines

**pH and Lime:** Fall is a great me to lime because it allows time for soil pH changes to occur before planting next spring. Lime is finely ground rock and changes to soil pH do not occur instantly. Biological and chemical processes need to take place for soil pH to change. This can take anywhere from 3 months to a year depending on the fineness of the lime, and soil and environmental conditions.

In general, vegetable crops grown on mineral soils will thrive at pH 6.0 to 6.5. Some vegetables do well at pH 5.5; potatoes will tolerate even greater acidity. In contrast to mineral soils, the desirable pH for muck soils is approximately 5.5, and they should not be limed above pH 5.7. Specific pH ranges for individual vegetable crops are given under each crop's fertility section in the Cornell Vegetable Guidelines.

When soil pH is adequate, the availability of both major and minor nutrients is maximized, and the accumulation of toxic metals is minimized. Clearly, one cannot expect to maximize dollars spent for nitrogen, phosphorus, and potassium fertilizer when soil pH is suboptimal. Thus, many people consider soil pH to be the most important part of the soil test.

Soil Testing and Fertilizers: Fertilizer requirements for best economic yield should approximate the difference between what vegetables take up from the soil for best growth and quality, and what the soil can actually supply during the crop-growing period. The essential nutrients in soil cannot be determined without a soil test. Moreover, if pH is not in a desirable range, yields may be poor regardless of fertilizer added or already present in the soil.

Soils on which vegetables will be grown should be sampled and tested at least once every three years. In general, when the Cornell-recommended rates of fertilizer are applied, low soil test values for phosphorus and potassium usually increase slowly and steadily in spite of crop removal. Medium soil test values tend to remain constant or increase slightly, whereas high values decrease gradually. The potassium level could decrease much more rapidly, however, if a light sandy soil with relatively low exchange capacity is coupled with a heavy potassium feeder such as potatoes or tomatoes. In such situations, yearly sampling is appropriate. The purpose of applying nutrients, however, is to benefit crop development, not to achieve a predetermined test result.

Soil testing in New York is now done by Dairy One/Agro One, in cooperation with Cornell University (730 Warren Rd. Ithaca NY 14850; 1-800-344-2697 x2172; or go to: <u>http://dairyone.com/analytical-services/agronomy-</u> <u>services/soil-testing/</u>. Order sample boxes and Soil Submittal Forms by phone or online. New York growers interested in obtaining Cornell fertilizer guidelines for vegetable crop management should choose "New York samples - Cornell guidelines," and "Commercial Vegetable - Modified Morgan Analysis," to get the correct Soil Submittal Form - V or V2. See: <u>http://dairyone.com/wp-content/uploads/2014/01/Form-V.pdf</u> Be sure to include the necessary field information (soil type and crop to be grown), or fertilizer guidelines can not be included with your results. Include your check with the sample box and form, and mail to Dairy One Agro-One.

The soil test results provide soil pH, percent of organic matter, and level of phosphorus, potassium, magnesium, calcium, and zinc. Levels of aluminum, iron, and manganese are also listed to identify potential toxicities rather than deficiencies. Other nutrients can be tested for an additional fee. See the nitrogen, phosphorus, and potassium recommendations under each crop to design a fertility program for your farm.





Cornell University Cooperative Extension Cornell Vegetable Program

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VegEdge is the award-winning newsletter produced by the Cornell Vegetable Program in Western New York. It provides readers with information on upcoming meetings, pesticide updates, pest management strategies, cultural practices, marketing ideas and research results from Cornell and Cornell Cooperative Extension. VegEdge is produced every few weeks, with frequency increasing leading up to and during the growing season.

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Cornell University Cooperative Extension Cornell Vegetable Program

Diversity and Inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.