Cornell University Cooperative Extension

Eastern NY Commercial Horticulture Program

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Weekly Vegetable Update

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It May Not Be Business As Usual This Year, Pay Attention to Your Pricing

This coming year is looking to have increased likelihood of rapid price variability, and spot shortages of supply forcing shifts to alternative sources by retailers. Estimated price increases in fruits and vegetables range anywhere from 10% to 25% depending on what the product is.

Photo by TR

The cause of this potential change in market dynamics is the result of the California drought changing how much and what is going to be planted. Current estimates are that California has 500,000 acres (approximately 12% of principal crop acreage) which will not be put into production this year. This is due to lack of water as well as directing what irrigation water there is to stabilize crops with long term grower commitment such as fruit and nut trees, further raising questions as to what will be coming out of the west.

The USDA has not yet (as of April 1, 2014) released their Planting Intentions report for fruit and vegetables, but do expect decreased acreage similar to what they reported for grain and row crops which ranged from a drop of 15% in wheat to a 28% drop in corn plantings.

What makes the situation even more complex are lingering effects from global conditions affecting supply and demand; China had a dry 2010, Texas had a dry 2011, and Chile had a dry season this year. Last year alone beef, bacon, lettuce, tomatoes, and broccoli posted gains much higher than overall food inflation of 1.4%.

So what does this mean to you? Keep aware of what your competition is pricing at. Check pricing frequently as prices are likely to more volatile if spot shortages occur. Keep abreast of where products are coming from at the retail level and don't be shy about "Locally Grown". The bottom line is to not underprice what you grow solely basing your pricing structure on "last year", or "how I have always done it". Don't leave money on the table – put it in your pocket. No one clearly knows what to expect, except that supply, demand, and pricing will be different this year. *-BW*

Sources: USDA, Bloomberg News, RFDTV, San Jose Mercury News, KQED Public Radio

Managing pH and Alkalinity in Greenhouse Transplant and Container Production

The pH of media effects plant vigor, growth, health and ultimately profitability. Managing pH in container media can be a frustrating task, particularly when you are dealing with vegetable transplants in small volumes of media. When transplants are grown in potting media, pH can change quickly—much more quickly than outside soil pH changes. This is because potting mixes don't have nearly as much "buffering capacity" as soil. In field soil, less lime is needed to change a sandy (lighter) soil's pH than to change pH on a heavy clay. You can think of potting media as a super sandy soil.

Management begins with an understanding of the relationship of media components, water alkalinity and fertilizer to pH. Followed up with monitoring and adjustments, pH can be successfully managed.

Pepper transplants showing Iron deficiency (light green new growth) due to high media/soil pH. *Photo by TR*

pH is a measure of how acidic or basic a solution is. Positively charged molecules such as H^+ will make solutions acidic (lower pH) and the negatively charged OH^- molecules are basic (raise pH). pH becomes an important part of managing a plant nutrient program. For many plants, nutrients are available for plant roots to absorb when they are soluble at optimal pH levels of 5.5 to 6.5 .

High pH issues - When root zone solutions have a high pH (basic) of 7.0 and above, micronutrients like iron, manganese, zinc and boron are insoluble and unavailable for roots to absorb, resulting in nutrient deficiencies. Although your inclination may be to supplement the plants with the missing nutrient, your real long term solution is to lower the pH thus allowing these nutrients to become available.

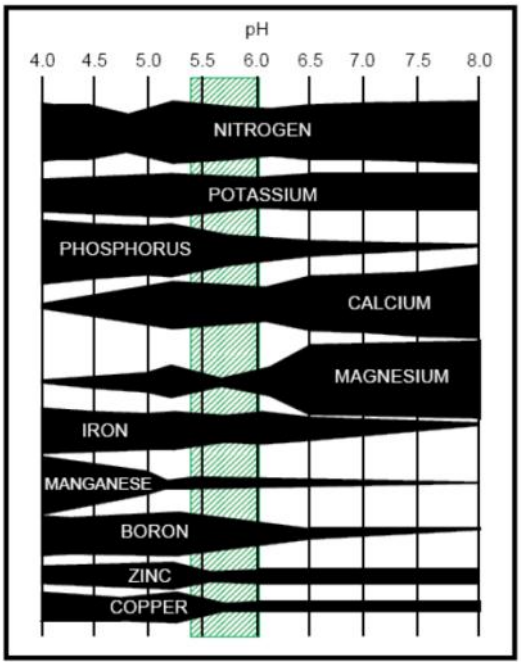
Low pH issues – The same micronutrients that are insoluble under high pH conditions are very soluble and available to the plant under low pH (under 4.0) conditions. Nutrient toxicity can readily occur under these conditions. The long term solution is to keep the media pH in the proper range of 5.5 to 6.5.

Correcting pH Problems

Start with the media – Acidic media like sphagnum peat, coir, pine bark and composts are usually acidic. Alkaline media includes items like hardwood bark, vermiculite, rock wool and rice hulls and the neutrals like perlite, sand and polystyrene. Depending on your ingredient preference, the media may be acidic. Limestone is often added to adjust the pH to a more desirable level. Make sure the limestone is thoroughly dispersed within the mix. It is common to find large variations in the pH of the media due solely to poor mixing. Commercially purchased mixes can have significant pH variations from bag to bag and lot to lot.

Water and pH - The Alkalinity level of your water may need to be adjusted to properly manage your container pH. Alkalinity is the ability of water to neutralize acids due to the dissolved alkalis (bicarbonates) in the water. The greater the amount of dissolved alkalis in the water, the more acid will be needed to neutralize it. Think of alkalinity as "liquid limestone". The primary source of alkalinity in ground water aquifers, rivers, ponds and lakes are limestone deposits that have reacted with water over time. Throughout the seasons, water levels within aquifers can change. High water levels can dilute alkalinity levels just as low water levels can concentrate them. Sample your water 2 or 3 times during the year as you notice conditions change. If your samples show significant change, then you know that regular sampling is necessary.

High alkalinity water will tend to raise the pH of media over time. Yellowing on the upper leaves of pepper and tomato transplants can be an indication of iron deficiency brought on by high media pH. This is seen fairly often and can result in poor transplants. The more you water, the more liquid limestone is delivered, the more your pH rises.



Alkalinity is measured in ppm of $CaCO_3$. For greenhouse use, water that is moderately alkaline (80-120 ppm) is considered ideal. With low alkalinity levels, pH fluctuation can occur very rapidly. Moderately alkaline water will provide a slight buffering effect to help moderate wide pH fluctuations. If your water alkalinity is high (over 200 ppm), it can be lowered by injecting acid into your irrigation system using a proportioner. Citric acid can be used in

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organic production, sulfuric acid is commonly used in conventional production. If the alkalinity is slightly high, between 100-200 ppm, using an acidifying fertilizer alone can often alleviate the problem.

You should test all your water sources on the farm before considering adding acid. Your alkalinity reading will determine the amount of acid to be injected into the system. High alkalinity water can also degrade the active ingredient and effectiveness of certain pesticides. In the lower Hudson Valley, water from many wells regularly tests high in alkalinity, 200 ppm or higher.

Fertilizer and pH - Ammonium and urea are acid forms of nitrogen in fertilizer and tend to lower media pH. Nitrates are basic forms of nitrogen and tend to raise the pH. Many commercial fertilizers are combinations of all nitrogen types. The label should indicate how acid or basic the fertilizer is. As an example, a 21-5-20 fertilizer has a potential acidity of 400. This means the pH effect of an application of one ton of 21-5-20 would be neutralized by 400 pounds of calcium carbonate limestone.

Regular weekly monitoring of the pH in your container media is not complicated and should prove worthwhile. Next week I will cover methods for testing pH and alkalinity. If you should have any questions, please feel free to email them to me at tr28@cornell.edu. A free workshop is being offered on water quality, media, and fertility on May 6 and 7 - see details on page 6 of this newsletter. - *TR*

Source: Lessons Learned from On-Farm Trials with Organic Mixes – Alkalinity and pH, by Molly Shaw, Cornell Cooperative Extension of Tioga County, and Stephanie Beeks and Neil Mattson, Cornell University Dept. of Horticulture

Sanitizing Used Tomato Stakes and other Surfaces

If any of you have had a Bacterial Canker outbreak in tomatoes on your farm, you know how devastating this and other bacterial diseases can be to your crop. Our first line of defense for these pathogens is to be sure we purchase seed from reputable sources. The second and the one that we have the most control over to reduce your risk of spreading these pathogens to the rest of your tomatoes is being sure that the surfaces these plants come in contact with from seeding to transplanting are clean and disinfected. This means seeding flats, transplant inserts and bottom trays, greenhouse benches and also your stakes if you are tying and trellising your tomatoes. There are several disinfectants that can be used for disinfecting tomato stakes and each one has pro's and con's., but first things first: **The cleaner you start, the better job your disinfectant will do!** Start by:

* Cleaning all dirt and debris from the surfaces you want to disinfect! In this case our stakes but this includes all of the other surfaces I mentioned above including greenhouse benches, inserts, bottom trays etc.
* "Pre-cleaning" is important because organic matter, dirt and other particulates tie up the active ingredients in our disinfectants and reduce their effectiveness!
* There are lots of ways to do this but I think the most effective is to use a power washer or a hose and scrub brush. Yes, it is time consuming, but well worth it otherwise the rest of the sanitation could be worthless!
* In the case of tomato stakes, do not pack stakes too tightly in the washing container—allow solution to distribute evenly and contact all surfaces of the stake. Surfaces of stakes in the middle of a tightly packed group may not completely be soaked.

Clorox/Bleach (5.25% sodium hypochlorite)

- Use rate of 1 part bleach to 9 parts of water (or 10% solution).
- Bleach is highly susceptible to tie-up by organic matter and debris: Best to "pre-clean" stakes before disinfecting them!
- Completely submerge stakes and allow to soak for at least 30 minutes before removing and rinsing.
- If possible, lower water pH to 6.5 – 5.8 to obtain the most activity from bleach.
- Add bleach or change water frequently when it becomes visibly dirty.
- Bleach is also short-lived after mixing in water, with a half-life of only 2 hours so replenishing often will be critical for the best activity.

Green-Shield (quaternary ammonium chloride salt)

- Recommended use rate is 1 tablespoon (= 0.5 fl oz) per gallon of clean water.
- Allow surfaces to remain wet for 10 minutes before rinsing off with clean water.
- For stakes, trays and inserts, use the same rate as above and fully submerge and allow to soak for 10 minutes and rinse thoroughly.
- Very effective and economical: 1 gallon of Green-Shield is equal to 28 gallons of Clorox.

ZeroTol 2.0 (hydrogen peroxide + ethaneperoxoic acid)

- Use a dilution of 1:300 or ½ fl. oz per gallon of clean water and spray until runoff on greenhouse surfaces etc.
- Use a dilution of 1:50 or 2½ fl. oz. of ZeroTol 2.0 per gallon of clean water **if surfaces have not been pre-cleaned.**
- For stakes, trays and inserts, use a 1:100 – 1:300 or 1¼ fl. oz. – ½ fl. oz. per gallon of clean water and spray until runoff (according to label). However, I would recommend submerging these items for at least 5 minutes before rinsing with clean water. - *CDB*

Calibrating Fertilizer Units on Corn Planters

Sweet corn planting under rowcovers and plastic is underway, but how many of you have actually taken the time to see how much fertilizer you are actually putting down through your planter? I know that many of us fill the hopper, plant a certain acreage and say "It looks like that's about what should be left over in the hooper". Over time, the augers, fertilizer disk openers and other parts can get worn out changing the amount of fertilizer actually coming out. It's important to know either way—too much or too little—what is going on with your fertilizer applications. I know it might not seem like a lot, but a 15% difference in what you think and what is actually being applied can add up over time. If you think you are applying 300 lbs per acre, but you're off by 15%, that's 45 pounds extra per acre. Over 100 acres that can add up to 4,500 lbs of extra fertilizer and depending on your analysis and supplier $800—$1,600 more in fertilizer costs. Likewise, if you are 10% under and not making it up with a sidedress application, you could be reducing yields or quality and losing money.

Length of Row to Equal 1/50 of an acre	
Row Spacing (inches)	**Number of feet to Travel**
28	373
30	349
32	327
34	308
36	290
38	275
40	261
48	218
60	174
96	109
108	97

Calibrating your fertilizer delivery rates through your planter is really not that difficult. I would say it is similar to calibrating a sprayer. I found that an easy way to determine how much fertilizer you're putting out is to determine how far you need to drive to equal 1/50th of an acre using your row spacing. For example—if your between-row spacing is 30" then you need to travel 349 feet to equal 1/50th of an acre. The table here lists some common spacings to help. It may seem strange to see spacing in the table of 108", but if you're growing pumpkins, it may be a common spacing for some of you. If your row spacing doesn't show up in the table, you can figure it out by dividing 43,560 by your spacing in feet. Multiply that number by 0.02 (which is the decimal equivalent for 1/50th) and that is the distance you need to travel.

After you have determined how far to travel, the next step is to disconnect the drop tubes from your fertilizer hoppers and attach a bag or bucket underneath to catch the fertilizer. Make sure the hoppers are at least half full of fertilizer when you start. Also be sure that the augers are "primed" by dropping the planter and moving forward until you see fertilizer coming out of the hoppers. Then, using flags or some kind of stakes, drive the required distance, remove the bucket or bag and weigh it. If you're using something that's heavier than a plastic bag, be sure to subtract this weight from your sample. Once you have the weight, multiply it by 50 and that is the approximate amount of fertilizer you're applying in pounds per acre.

For example, if the amount you weigh from one tube equals 6 pounds, then you are applying 300 pounds of fertilizer per acre. **Do not add the fertilizer amounts from the hopper together.** The value you get per row should be similar. If they are not, you may need to exam your augers to see if they are worn differently etc. If the rates are similar, but not what you thought you were putting out, you need to review your manual (if you have one) and adjust your sprocket settings. I would also recommend you do this 2 or 3 times and average the values together per row. I would recommend you do this every time you change a sprocket combination as well.

The tables in your planter's manual should be close but I have seen where they don't match at all. After looking at the manual for a bit, we concluded that sometimes planters have the ability to use different augers. You could have a "normal output" auger or a "high output" auger, and depending on which type you have, you need to read the right table in the manual (trust me, that's from personal experience). If you're replacing one auger, it's better to just replace all of them at the same time; that way you know everything will be more of the same when you head out to plant your crop.

Also be sure to check your fertilizer disk openers and make sure they are not worn out. The rule of thumb for fertilizer placement is 2 x 2 or 2" below the seed and 2" to the side of the seed. Anything closer than this can result in fertilizer burn on your crop. Many times when we see fertilizer injury it's not because the rates were too high or the coulter was mounted wrong, it's because the disks were worn and instead of being the 2" below the seed, it was even with the bottom of the seed furrow. Also, make sure your drive chains are all in good shape and none of the links are seized – even if you stored them in oil, be sure to check them and make sure they roll smoothly.

When is the last time you checked your seed tube to make sure it wasn't worn out? It is all too common to find seed tubes that are worn on the very ends and feels like a sharp lip. This can cause problems because it kind of flips the seed instead of allowing it to fall into the bottom of the seed furrow resulting in seed that may not be at the depth you want and uneven emergence! Even before you get that far,

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Calibrating Fertilizer Units on Corn Planters, continued from p. 4

make sure your meters and fingers are working properly. If you suspect a problem you can usually take them to your local dealer (call first) to have them checked or there are some private companies that will also test your meters to see if there is a problem. Don't forget to bring some of your seed too, in order for them to run an accurate test.

If you have more questions on this, give me a call and I can get you to someone that can help.

You can also use the same formula and techniques to determine how much fertilizer you're using if you are sidedressing with a Cole or other type of unit.
If you have questions please feel free to call me (Chuck) at 518-859-6213. - *CDB*

Early-season Eye on: Pythium and Rhizoctonia

Damping-off is a common problem that kills seedlings in the field and the greenhouse. Damping-off can kill both germinating seeds and young seedlings. Several fungi can be involved in damping off but the most common and damaging are Pythium and Rhizoctonia. Practically all species of plants can be affected and without rigorous sanitation practices, especially in greenhouses, it can be difficult to manage.

These diseases are favored by cool, moist conditions and are rarely seen in seedlings started in the heat of the season but it can be common to find damage in overcast, cool, rainy springs.

Dampening off of pepper seedling

Courtesy of OMAFRA http://www.omafra.gov.on.ca/IPM/english/peppers/diseases-and-disorders/damping-off.html

Symptoms Above Soil Level:

- Dead patches in flats or fields, can be confused with poor germination. Fungi attached seedling before emergence. If it is only in low spots, it is likely the damping-off where poor germination would display evenly through the field wherever that lot of seed was planted.
- Plants are stunted, possibly yellow and wilted from poor root activity
- Plants may wilt at mid-day and may recover at night for a couple of days before dying or improving.

Below-ground symptoms:

- Root tips are brown and dead.
- Brown tissue on the outer portion of the root appears water soaked and easily pulls off leaving the hair-like root core exposed. This is because the fungus colonizes between the layers of root cells.
- Seedlings may develop a girdling and darkening of the stem rot near the soil surface which will cause them to fall over and die as the rotted area shrivels. This can be confused for wind damage.

Management for Greenhouses:

- Sanitation – Clean and disinfect all tools, trays, containers and equipment. Use sterile media. Keep watering wand off the floor and reduce opportunities for "outside" soil to get in.
- Manage soil moisture by using properly draining media and reduce opportunities for overwatering.
- Manage soil temperatures by providing adequate heat and/or using heat mats under trays.
- Reduce standing/ponding water which encourages shore flies and fungus gnats who feed on roots providing opportunity for infection.
- Manage fertility so as not to "burn" roots
- Remove any symptomatic plant material immediately

Management for Fields:

- Avoid planting in low spots or anywhere water has a history of standing water.
- Avoid early planting of fields with a history of damping-off.
- Avoid planting problematic fields until soil temperatures are adequate for the variety of plant to germinate and thrive.

Control Measures:

Several fungicides are available as seed treatments, potting mix additions or at-planting applications for conventional producers. For organic producers or those looking for a biological control, *Trichoderma harzianum*, known as T-22 is a good choice. It is available as seed treatment or soil mix addition. It is quite effective, even in comparison to conventional chemicals. -*MRU*

Free Workshops on Managing Fertility, Water Quality, Irrigation and Media in your Greenhouse and/or High Tunnel

May 6 and 7, 2014 - 2 Locations

Dr. Neil Mattson of Cornell University specializes in growing crops in protected culture. Please join us to learn more about managing food crops in these systems. **Farms are encouraged to bring water samples for testing pH, EC and alkalinity or soil and substrate samples for pH and EC testing.**

- Tuesday, May 6, 4-6 pm at Fledging Crow Farm, 122 A. Robare Road, Keesville, NY 12994
- Wednesday, May 7, 3-5 pm at Ariel's Farm, 194 Northern Pines Road, Gansevoort, NY 12831

The workshop is free, but registration is encouraged. Call Marcie at 518-272-4210 or mmp74@cornell.edu.

Farm Food Safety Training with GAPs: A Produce Safety Workshop

CCE Albany County, 24 Martin Road, Voorheesville, NY 12186
April 30 and May 1, 2014 from 8:30 am - 4:00 pm both days

Goals of this workshop: to understand how GAPs (Good Agricultural Practices) impact produce safety; to learn what is needed to have a USDA GAP/GHP audit and the 2 types (Harmonized & Basic); and to begin writing a farm food safety plan that complies with a USDA GAP/GHP Audit.

Growers participating in this training will receive: a flash drive pre-loaded with templates to use in writing your own farm food safety plan including templates of record keeping forms; Farm Worker Training CD; Food Safety Begins on the Farm: A Grower Self Assessment for Food Safety Risks ; and bag with lots of other resources.

$50/farm to attend (up to 2 people per farm) - includes lunch. Class size is limited so call now! For more information and to register Call Cathy at 845-344-1234. Let us know if you any special dietary needs (vegetarian, nut allergy etc).

Co-sponsored by the NWF Local Economies Project, Cornell Cooperative Extension, the National GAPs Program, the Produce Safety Alliance, Cornell University, and the NYS Department of Agriculture & Markets

USDA Announces Release Date for the Final 2012 Census of Agriculture Report

Excerpt from USDA Press Release WASHINGTON, April 9, 2014, full article available online at http://www.agcensus.usda.gov

The U.S. Department of Agriculture's National Agricultural Statistics Service (NASS) today announced it will publish the 2012 Census of Agriculture full report on May 2, at Noon ET. The complete data series will be available in multiple formats, including Quick Stats 2.0 – an online database to retrieve customized tables with Census data at the national, state and county levels.

When released, the 2012 Census of Agriculture will provide information at the national, state and county levels. The publication will include highly anticipated data on a range of topics, including agricultural practices, conservation, organic production, as well as traditional and specialty crops.

The final publication will provide more in-depth information than NASS released in February's preliminary 2012 Census report on farms and land in farms, economics, and demographics. The 2012 Census final report will also give first-time or expanded data on biomass production, equine, Internet access, regional food marketing and distribution, land use practices and agroforestry. For more information about the Census, including the preliminary data, the Your Census. Your Story. interface, and access to the full 2012 Census report when released, visit www.agcensus.usda.gov.