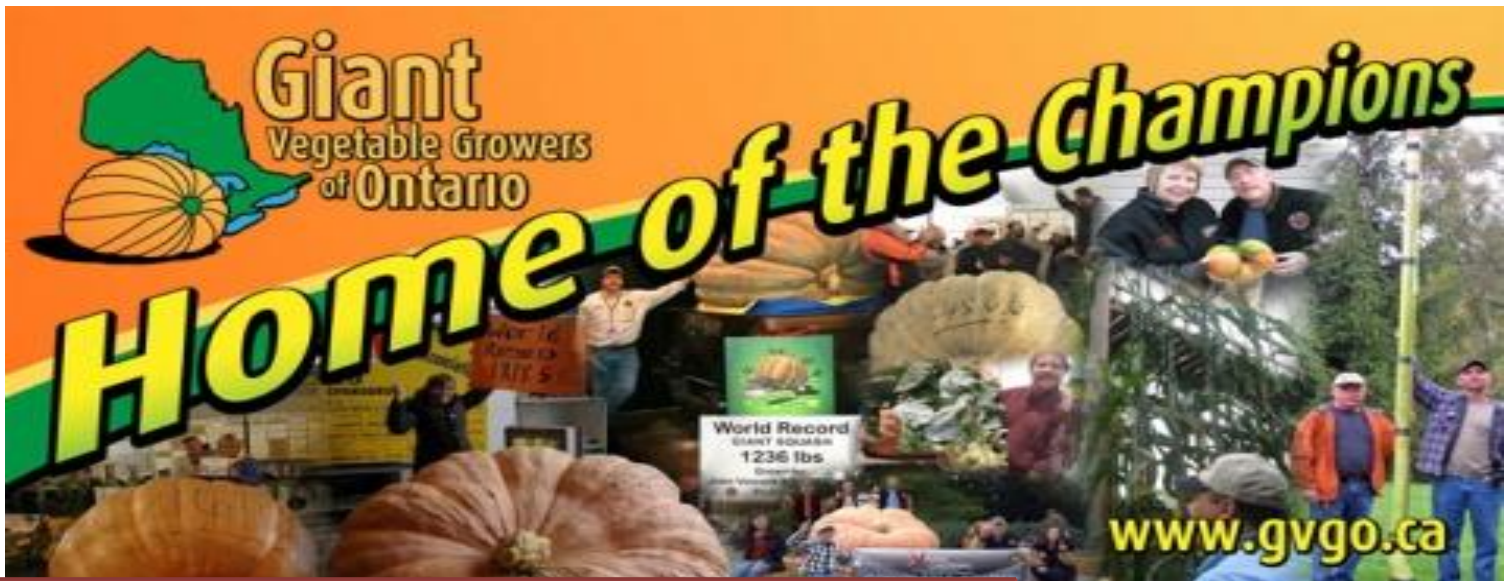




# Over The Top

**Gardener's Journal**

## Giant Vegetable Growers



**Thanks to all Commonwealth Members**

2096 Meier 14 , 2102 Meier 14, 2323 Meier 14.



Volume 1 Issue 1

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Over The Top

# Gardener's Journal

## Editor Notes

### Did you know?

The 1059 Vincent-McGill 09 has produced 5 Howard Dill winners over the years

Welcome to the NEW spring edition the GVGO newsletter

*Over The Top* ....is our last look at what went right in 2014.

From disconcerting summer weather patterns to soil issues that caused plant problems and now Cell Division we hope you'll find the many Tips & Solutions inside valuable. This issue is once again packed full of NEW growing tips to help you get your solid & heavy over the chart fruit, intact and transported to the scales.

*The GVGO continues to be the most trusted source for giant vegetable growers in the Commonwealth. Our vision endures the friendships, knowledge and growing experiences shared by all growers reaching our members throughout the world.*

The secrets to growing the great pumpkin and humongous vegetables are revealed inside. Follow these steps to grow and harvest your own monster fruit.

Russ Landry



## Time to Renew

**Sign up NOW or renew your 2015 GVGO membership today by Paypal.**

### GVGO Fund Raising goal for 2015

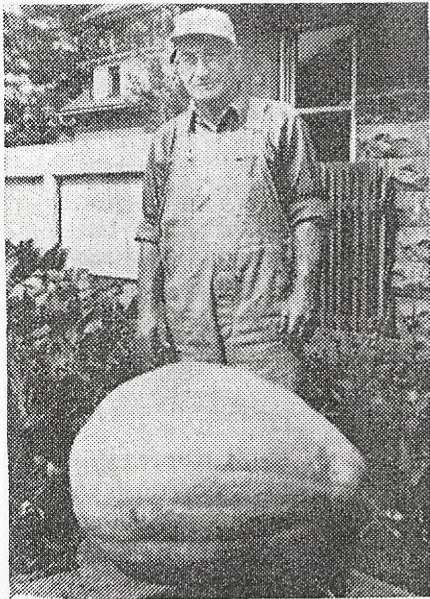
The GVGO is once again hosting auctions please donate your seeds generously for this coming fall's 2015 auction season yet to come.







# 1st PRIZE.. Penn State Farm Show grown with Webb's SUPER-GRO



Fred Antes, professional nurseryman, Williamsport, Penna., stands proudly over this prize-winning 88 lb. squash. He credits SUPER-GRO for helping him win this prize... as well as for giving him the quality plants that bring plant buyers from miles around to his nursery.

When professional nurserymen choose a soil builder, it has to produce. It has to help grow the kind of high-quality shrubs, flowers and trees that will attract buyers ... in farm crop quantities.

That's why Fred Antes, at left, nurseryman from Williamsport, Pa., has been using Webb's SUPER-GRO. It consistently gives him the kind of plants his customers want. SUPER-GRO gives you finer vegetables and fruit, more vibrant flowers and rich green lawns. SUPER-GRO is an all-natural organic soil builder. Approx. 50% rich animal compost, derived from bone, tankage, etc., plus generous amounts of calcium, phosphorus, nitrogen, and potassium. It feeds the soil naturally with all these important nutrition factors... builds your soil by restoring humus elements, beneficial bacteria, and vital trace minerals.

Dozens of testimonials show that SUPER-GRO helps grow bigger... and better crops on the largest farms in the smallest vegetable gardens. Be sure your food this year will be rich in priceless nutrients... be sure your flowers and lawn are the best in the neighborhood.

Order enough SUPER-GRO now at these economical prices:

10 lbs. .... \$ .89 plus postage

80 lbs. .... \$3.75 plus postage

*Organic Farmers! Special tonnage rates on request.*

*Dealerships open: Write for details.*

## WEBB'S SUPER-GRO PRODUCTS

WEBB BLDG., DEPT. 5,  
FLEMINGTON, PENNA.

May, 1954

9

## Kahuna's Keys:

Fred knew in 1954 that  
**NPK + Ca = Bigger Pumpkins**  
**SUPER-GRO is still priceless**

**What is Brix**

### **Brix**

**Brix** (symbol °Bx) is the sugar content of a solution. Brix is used in the food industry for measuring the approximate amount of sugars in fruits, vegetables, juices, wine, and soft drinks and in the starch and sugar manufacturing industry.

# Top Ten, Spring 2015

Yet More Pumpkin Growing Idioms

By Phil Joynson

Due to over whelming popularity, (I had two people say they liked it so I'm high on praise)  
I present yet more pumpkin growing idioms.

10. Walk of shame- The trip back to your seat once you've had your pumpkin weighed and it goes really light to the charts. This walk is made worse if they weighed your pumpkin last.
9. Dill Dream - Day dreaming about pumpkin growing.
8. Duck Feet- Comes from the term "Duck Boards". These were the boards used in the trenches during World War 1. Duck Boards were used to keep the soldiers feet dry. "Duck Feet" are the board's growers strap onto their feet to avoid soil compaction. Duck feet amuse the neighbors and your spouse.
7. Dog Tracking- This is the trail of dirt the grower tramps though the house but blames it on the dog.
6. Ammo Dump, the Hurt Locker or Lil' Chernobyl- Your growing supplies cupboard.
5. Hippy Feet-Condition brought about by wearing saddles while working in your patch.
4. Low Rider- A pumpkin that compresses a truck's suspension.
3. Garden Gnome- One who spends way too much time in the patch.
2. Pumpkin Rash- Brought about by wearing shorts and walking through pumpkin foliage. Funnily enough, there is no term for those thorns on pumpkin stalks that cause this condition as of yet.
1. Cheeto - A bright orange pumpkin that goes very light to the charts.

OK, so now we all are clear on these issues **"Pumpkin Lingo"**.

Let's put this new knowledge to work in a few sentences...

After a hard winter of "Dill Dreaming", I restocked my "Ammo Dump" and was ready for the season. My wife was tired of the "Dog Tracking" and "Hippy Feet" so I made up some "Duck Feet" too. I became a "Garden Gnome" during the season and I had "Pumpkin Rash" so bad it looked like I was wading through broken glass. Finally in the fall, I loaded up my pumpkin and headed to the weigh-off. There were lots of "Low Riders" at the event but my pumpkin had a bigger OTT, so they weighed it last. My pumpkin ended up being a huge "Cheeto" and I was forced to do the "Walk of Shame".



# Tenured Cultivator

**Paul & Candy Dettweiler our featured growers.**

GVGO growers wish to welcome Paul and Candy to the patches of your backyard dreams.

***So Paul tell us a bit about how you and Candy began the journey into giant pumpkin land and the GVGO.***

I started growing Giants about the year 2000. I had a large garden near a Fertilizer Plant where I worked. One of our customers brought me in four AGP seeds, so I started them and three sprouted. The first season produced a beautiful 419 pounder, I was off and running.

***Paul you've been around the GVGO and BP for years!***

We decided to head to one of the Pumpkin seminars at the University of Guelph. Candy and I have also attended most of the conventions in Niagara Falls; we were present for the founding vote of the GVGO.

***Tell the growers a bit about your patch***

My patch is 30 ft x 90 ft. I grow three plants spaced along the 90 ft side about 4 ft from the edge. The main vine grows straight across the patch. I run a snow fence between the plants and at each end for wind protection. When the secondary vines get close to the fence they are cut terminated and buried. All vines including the main vine are buried with Mykes, kelp and carbon (Humic Acid) is added at each node. John and I each have a patch running parallel about 20 ft apart in the middle of a large mowed lawn. I put up snow fence on the East and North side to help break up the wind. The soil is sand with a bit of clay mixed in. We have grown in this patch for two years.

***Do you grow only AGP?***

The last few years I have only grown Giant Pumpkins but thought when I finally grew a BIG one I would try squash. Things went so well this year with the plants (1499.5). I decided to stay with Giants Pumpkins, and push for more Orange.

***Do you have any stubborn soil issues?***

The main problem is the soil in my patch is getting the Manganese and Boron up to acceptable levels. I always have what I thought was Mosaic Virus, but I am now suspicious it's a nutritional problem. All weed, insect and disease problems have a nutritional component so that is my area of concern.

***So like all growers you battle insects annually?***

My main insect problems have been Cucumber beetle. They don't do much damage but I'm concerned about the diseases they might be spreading. My plan to fight insects and disease is to keep the plants healthy. First you have to balance the minerals in the soil. Then you have to have good biological life. To accomplish this you have to have proper moisture, air and food for the microbes. Also you do not want to kill them off with salt fertilizers and pesticides. To help keep insects away garlic and neem oil is used by foliar sprays.

***What soil supplements do you use in the 1499.5 patch?***

I use mushroom compost, composted Maple leaves, chicken manure and hay. I also use fish, seaweed, carbon, molasses and Ignite(bio stimulant) I add peat moss and worm castings to the hill. I foliar feed with fish, seaweed, fulvic, foliar blend Agrigro, Montys, 8-16-8 and 2-15-15, corn sugar a phosphate product (Sitko 0-7-17) and Actinovate.

***What about leaf problems and end of season diseases?***

Powdery Mildew is my main foliar disease. For PM I use milk, mixed 10-1 water to milk ratio. I now have a back pack sprayer for foliar applications. This past year I borrowed Johns mist sprayer. So I hope to have an air compressor at the patch this year so I can use a siphon sprayer. The stomata on the bottom of the leaves are for picking up carbon dioxide. When you put your spray into a mist it picks up carbon from the air so it's taken into the plant much more efficiently. You can use fewer nutrients and obtain far better results with fine mist sprays.

I want to do more tissue testing in the future, that way leaf tissue deficiencies can be caught before disconcerting symptoms appear.

***Paul tips, good books you could share with the GVGO?***

I've spend most evenings checking the GVGO and Big Pumpkins. I'm always interested if a grower talks about the health of his/her plants. I think genetics can also make some difference in a plants health. I have been trying to learn what I can about soil Biology. I have several books that I have read and use as reference materials.

***The Ideal Soil: A Handbook for the New Agriculture. by: Michael Astera with Agricola,***

***Teaming with Nutrients and Teaming with Microbes. by: Jeff Lowenfels.***

## CO-PRESIDENTS' MESSAGE

By Phil Joynson &  
Russ Landry

From the Office of *Phil*



Greeting GVGO membership! Another fresh growing season is about to begin and another opportunity for the GVGO growers to dominate the giant vegetable growing world! Mother Nature was against us last year here in Ontario and it reflected in our results but we have an opportunity to shine once again with a few more sunny warm days this year.

A few things to mention that occurred over the winter. We held our seed auction on Bigpumpkins.com again and the results for the GVGO were more than amazing. The club raised a record amount of cash for the club. Thanks to the GVGO seed team and to those who donated seeds! This impacts greatly to the running of the GVGO as we will not have to increase membership fees and can buy needed supplies for running the club as well as have a surplus of cash for prizes, awards etc.

Secondly, the GVGO spring seminar will be back in Solina this year. (Details and directions in this newsletter). The executive of the GVGO we're polled and the most thought we should continue moving the seminar site every two years to make it fair to members who have to travel far to

attend this event. The seminar will again be catered this year as we have been spoiled by the high quality of the lunch provided the last two years. Thanks for setting the bar so high John Matesa! A few important things will be brought up at this year's event, like the future of the "Big Momma" contest, featured veggie of the year, featured "other" veggie of the year for 2016 (Beets were picked for 2015), weigh-off site funding, elections (if needed), prize money allocation. There will usual prizes awarded to the winners, presentations from weigh-off sites, guest speakers and info sessions as well.

As you know, it was decided that, for the most part, the club will no longer be in the growing supply business. We found that it demanded too much work from too few members for too little benefit. This void has been quickly filled by more than a few GVGO members. Make sure to patronize these vendors if possible because most use any profits to support weigh-off sites and that helps us all. We, asked suppliers to put together ads for this newsletter. Hopefully everyone will order these products. Order now if you can for pick up at the spring seminar.

Most micronutrients will be sufficient in plant leaves. Foliar spraying say for example can correct low Calcium (Ca) or other micros in the leaves. However in fruit it does not. This is in part because Ca is not mobile in the plant.

From the Office of *Russ*



Finally the spring season is heard on the song of the red robin. The new season is beginning and hopefully you're now planning out your seed line up as you prepare for springtime. The new planting season will help us forget the past winter we have just left behind us. The reminder of just exactly how challenging the winter was here in Ontario will drive us all out gleefully to our patches. Never have the winters temperatures been so below normal for so long. The relentless winters of 2013, 14 and now 2015 hopefully will turn into the 2015 summer of purely blissful pumpkin pleasurement.

Spring in Southern Ontario returns. Remarkably though the climate has turned around with a much more moderate snowfall fall and the few storms that did venture north have had little impact.

Growers can rest assured that this spring may present better growing opportunities. The trend to indoor growing in large climate controlled greenhouses has taken hold as large numbers of GVGO growers will grow indoors this year.

It's now once again time to apply all of the reflection and study. Indoor greenhouse growing has opened up a host of new skills growers will need to acquire. The GVGO continues to foster learning for new and education gardeners in understanding greenhouse or indoor growing.

We hope the Easter Bunny will bring GVGO growers new tools to combat the mystery of Mother Nature's weather challenges. Growers will need to begin investigating and investing in the new popularity of growing indoors. Fruit sizes are being swelled by leaps and bounds as Great Pumpkin Commonwealth (GPC) members are now expanding into large hoop house constructions.

*Over The Top*

*This issue marks the start of a new era We have now launched *Over The Top**

I am looking forward to helping you grow indoors and out and helping all the GVGO members thrive in the new season to come is my goal.

Good Luck & Good Growing  
Sincerely, Russ

## GVGO Memberships

Run from January 1st - December 31st  
Pay it now, to get the annual seed giveaway and the most informative growers newsletter.

by: PayPal, email money transfer or mail

PayPal to: [gvgogrowers@gmail.com](mailto:gvgogrowers@gmail.com)

Email Direct Transfer To: [gvgogrowers@gmail.com](mailto:gvgogrowers@gmail.com)

Mail To: **C/O Jane Hunt, GVGO Treasurer**  
**4376 Hwy 35 N**  
**Cameron, Ontario**  
**Canada**  
**K0M 1G0**

*Time to Renew*

*Suberized Roots*  
are older thicker roots that can't  
absorb water and nutrients.  
Suberin is a waxy, cork like layer  
that forms on the outside of  
mature roots





# Giant Vegetable Growers of Ontario

Visit the gvgo on facebook.

<https://www.facebook.com/pages/GVGO/140780926101331>

Editors: Nathan & Jennifer Veitch

*Comment on our wall, tag  
your pictures and send  
them to our facebook  
editors*



## Plant Biology - 101

**Q. Roots are important to plants for which reasons?**

- a. Storing sugars.
- b. Performing photosynthesis.
- c. Providing instructions for plant reproduction.
- d. Producing buds, which grow into lateral branches.
- e. Anchoring the plant, absorbing water and nutrients.**

## Tomato Flowers

Poor pollination often results from cold or high temperatures, excessive moisture or humidity in wet weather. Without full pollination fruit may grow misshapen or not at all. Tomato flowers are typically wind pollinated, and occasionally through bees. Lack of air movement or low insect numbers can inhibit the natural pollination process. In these situations, growers will hand pollinate tomatoes to ensure complete pollination. Tomatoes are self-pollinating; flowers are equipped with male and female parts. Pollen is normally shed from morning to afternoon, with midday the most optimal time to pollinate. Warm, sunny days with low humidity are ideal conditions for hand pollinating. Simply shaking plants gently will distribute pollen. Better methods flick the flower and truss with the tap of a finger. Growers may achieve better results by giving the vine a little vibrating instead. Electric vibrator devices to hand pollinate tomatoes; are a simple battery-operated toothbrush. The vibrations cause the flowers to release pollen similar to bees rapidly beating wings. Place the vibrating device (toothbrush) just behind the open flowers and gently blow on or shake the plant to distribute the pollen. Others prefer to collect the pollen in a small container and use a cotton swab to carefully rub the pollen directly onto the end of the flower stigma. Hand pollination is usually practiced every 2-3 hours days for 2to 3 hours to ensure pollination.

## The New Heavy Weight Champ



**John MacKinnon's, New World Record, Field Pumpkin 211 Pounds**

211.00	MacKinnon, John
--------	-----------------





## Giant Growers Creed

**Do not overwater,  
Do not over fertilize,  
Do not harvest too early!**

## Organic Matters Fungi

**Fungi:** play key roles in maintaining a healthy soil. Acting as decomposers, fungi break down organic matter into plant ready nutrients. Fungi aid in the decomposition of organic matter by extract soluble nutrients. Fungal nutrients are highly soluble and readily exchangeable. They boost the soils natural storage bin of ability to CEC. Fungi spread by sending long thin threads called **mycelium** in the From the mycelia the fungi sends out fruiting bodies, visible examples are mushrooms, toadstools & puffballs. Many contain millions of spores. When the fruiting body bursts, these spores are dispersed in the air or soil. Fungal spores are able to lie dormant for years until the right conditions for their activation arise.

# GVGO SEMINAR

The GVGO annual seminar will be held on Saturday April 11th in Solina Ontario.

Location

## Solina Community Hall

Solina is about 17 km North West of Bowmanville's Waverly Rd 401 exit, just off of Hwy 57 on Concession 6. Travel 3.1 km west and the hall is on the North side. The address is 1964. If your GPS does not recognize Solina, try Clarington.

The seminar starts at 9:00 am sharp but try and get there early to help set things up, pick up growing supplies.

Registration and coffee & doughnuts before 9am

<http://www.hiennumkins.com>

# Mineral Junction

## Sulphur (S)

**Sulfur is a yellow mineral, it is an essential element for all life.**

It is used as a component of fertilizers and to lower soil pH. The most important form of sulfur for fertilizer is the mineral calcium sulfate. Elemental sulfur is not soluble in water and, therefore, cannot be directly utilized by plants. Over time, soil bacteria convert it to soluble forms and acids which can then be utilized by plants and or modify soil pH. Sulfur improves the use efficiency of other essential plant nutrients, particularly nitrogen and phosphorus.

# Over The Top

Gardener's Journal

E-Zine

*Over The Top* is a new GVGO E-Zine whose focus is on growing anything green for the serious hobbyist or for the market grower. Published tri-annually, *Over The Top* E-Zine features reams of information about new products and exciting growing tips to boost growth and improve harvest yields.

*Over The Top* and the **Giant Vegetable Growers of Ontario** web site carries with it enormous marketing opportunities for keywords and SEO to grow your business into the highly competitive search engine driven world of ever increasing sales.

**Published by: Russ Landry**

Increase the size of your foot print into the world of fine competitive gardening by advertising with a large distribution network in North America

*Over The Top* can make sure your products are noticed and seen by your customers

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Please Contact:

[jr.landry@yhoo.ca](mailto:jr.landry@yhoo.ca)

**SONG OF THE YEAR!**

## "All About That Pumpkin"

Because you no it's all about that pumpkin, about that pumpkin.....

NO squash.....

Because you no it's all about that pumpkin, about that pumpkin.....

No squash.....

I'm bringing it pretty big and ugly .....

So go ahead and tell them Thick and Huge always wins.... because I'm here to tell ya.....

That every inch of it is perfect from the bottom to the top!

Because you no it's all about that pumpkin, about that pumpkin.....

NO squash.....

Because you no it's all about that pumpkin, about that pumpkin.....

No squash.....

My wife, she told me don't worry about its weight. She says growers like it heavier to hold its size.....

There won't be no cracks, no more silicone filling and no pretty Howard Dill winning.....

So if that's what you're into then go ahead and move along.....

Because you no it's all about that pumpkin, about that pumpkin.....

NO squash!

Because you no it's all about that pumpkin, about that pumpkin.....

NO squash!

Because you no it's all about that pumpkin, about that pumpkin.....

NO squash!

Lyrics by:

*Over The Top*

Gardner's Journal



The **GVGO** spent the winter asking 2000 pound pumpkin growers a few questions to help us understand what it takes to reach this lofty goal.

Hopefully these answers will help all our members reach a new PB. Thanks to Pete & Cindi Glasier (**P&C**), John Hawkley (**JH**) & Bill Neptune (**BN**) for taking the time to answer our questions. Your help is gratefully appreciated.

## Fall Patch Preparations

**P&C** - Our patch is only 3200 sq ft. The last two years we have ripped (Chisel Plowed) the patch 18 inches deep. Last fall we then applied 25 lbs. of myco and 5 lbs. of root shield. These amendments were tilled in. Then we spread 5 lbs. of annual rye grass which was tilled in to a shallow depth for germination. Areas around the perimeter not accessible to the tiller were shoveled by hand.

**JH** - Just to back up to last year....after a terrible growing season the year before, 4 pumpkins started with only one 1,039 pumpkin making it to the scales, I enlarged my patch another 1,500 sq. ft or so. I brought in 20 yards of topsoil and had a backhoe come in and turn every sq. ft. to a depth of three feet in the hopes of improving drainage. After that I added another 30 yards of topsoil, 20 bags of gypsum, tilled that in and planted a January cover crop. I have been growing for six years, this being my seventh; I will have to look at a rotation program soon. This year we put in a cover crop in the beginning of December, along with twenty pounds of Mycos. I also pulled a soil report and added some elemental sulphur to lower the PH a tad in hopes of being closer to where we want in the spring.

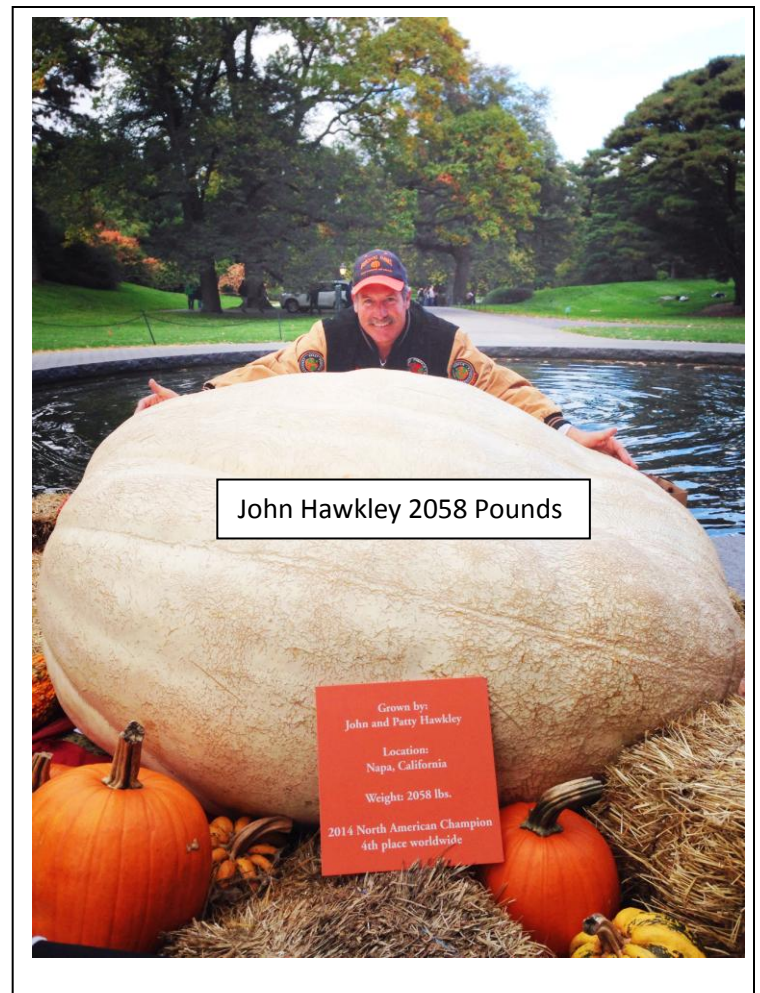
**BN** - My fall prep starts with the removal of all old plants. I clear the patch down to the bare dirt before I start to add amendments and till. My OM is low, so I add what I have, which is chopped corn stocks, maple leaves and 3-4 year old manure. I also, add lime to control my ph. Then everything is tilled in and winter rye is planted. The first rain I spray (6-8 ounces per gallon) of molasses with hot water. For 1000 square feet, I do not do a fall soil test. I rotate my patch every three years.

## Greenhouse

**P&C** - We did not grow in a greenhouse nor did we use a CO2 product enhancement product..

**JH** - This last year we switched back from small hoop houses to a 5 by 7 flat top box 6 mil house, which we used until the plants got big enough to remove. The weather this last year approached the 90 degree mark while they were still in them.....other than the wind protection they offered we probably could have not used them at all. I did have to use various screen fabrics in an attempt to keep them from overheating. Trying to keep them moist and less than 90 degrees was a real challenge. No Co2 products were used.

**BN** - I transplant my pumpkin plants in 6' x 10' hoop houses in the springtime.



## ***How they did it!***

### **Tilling**

**P&C** - We have natural clay soil and have added over 100 yards of compost over the last ten years. Pete turned the patch perimeter by hand - the rest was tilled in. We do soil testing in early spring. We applied 110 lbs. of humic acid, 150 lbs. of oyster shell lime, 75 lbs. of feather meal, 14 lbs. of myco. We added 8 yds. of compost (1/3 grape, 2/3 yard waste). This compost was spread throughout the growing season. The compost helps to keep the soil a constant temp and also reduces water usage. We add myco and root shield and liquid kelp and essential as we bury the pumpkin vines.

**JH** - I also have a clay based soil and my two patch sizes total approximately 4,500 square feet. Last year I added more than 50 yards of compost. I am thinking of adding another 20 yards or so this spring. We will pull another soil sample, and adjust the PH if necessary. Before planting I will figure out where my plants will be situated and add more amendments.... worm castings, Mycos, root shield, humic acid, hydrolyzed fish powder are some I use.

**BN** - I do a spring soil test as well before I start. Then I let my winter rye grow to 12" to 16" inches before I mow it down. This makes it easier for me to roto-till. After mowing I add the amendments from my soil test might suggest. Nitrogen (N) leaches from the patch soil fairly quickly, so I always need to add N in the spring. If I can, I buy the correct blend of N.P.K., If not I apply it separately. Then I apply my minor nutrients and till in.

**P&C** - We till our patch about 4 or 5 times a year in order to get the amendments in plus till the cover crop under. We do not see how we can reduce the number of tillings per year.

**JH** - Last year we tilled once at the planting of the cover crop and once again right before planting. Something to note is that four years ago we started paying to have the patches tilled with a tractor and we have had much better weight gains since.

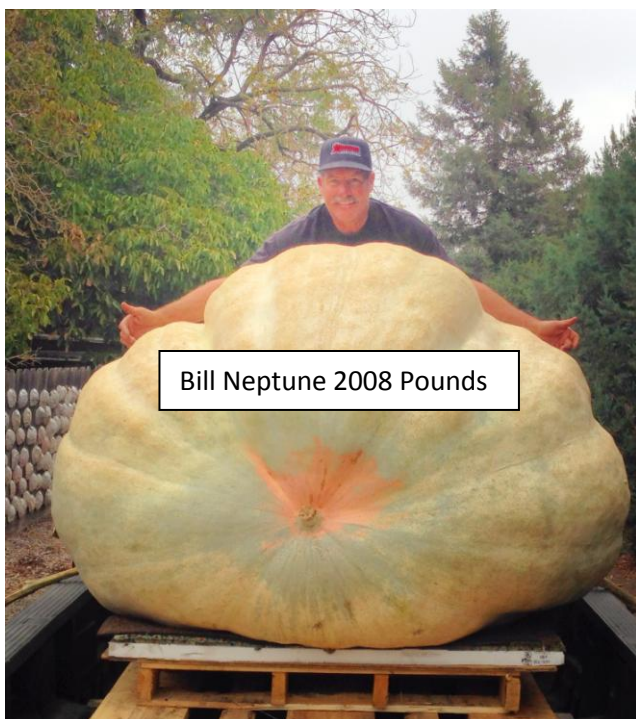
**BN** - After a first general wide spread tilling, I will only till what is needed for the plant after that. I till the planting site then move out as the plant grows. Taking care to never get close to the stump after the plant gets 6' to 8' because of the roots. I spray round up on the bare ground away from the plants where I don't till. I only till my entire patch twice.

### **Cover Crops**

**P&C** - We spread 5 lbs of annual rye grass which was tilled into a shallow depth for germination. In an effort to reduce disease in our patch we planted mustard (pacific gold variety) Nov. 1, 2014. We will see how that works out.

**JH** - I did not get last year's cover crop in until January, It was a mix of legumes, rye and vetch (treated with inoculants for increased nitrogen uptake). We did a quick plow in on the smaller patch and raked in the bigger patch. The plowed in patch actually was more even and that is what we did this year. More seed the better for weed control.

**BN** - Plant Winter Rye in the fall. I have never used mustard crop.



Bill Neptune 2008 Pounds



# Seeds & Starting Time

**P&C** - We start our seeds from April 15th to the 20th. We look for great proven seeds and also unproven seeds that may have great potential. Hard to get seeds we start one of each; the others we have back-ups for each planting site. We start our seeds in a large picnic ice chest with two 15 watt light bulbs for heat. The lid is adjusted so that the temp is 85 to 90 degrees at all times. We plant the seeds in Styrofoam cups, with the bottoms cut out and turned upside down with a seed starting mix. We added a small amount of myco and root shield to the seed starting mix. As soon as the seeds come up and the seed shell is off they go under florescent lights no further than 2 inches from the bulbs. 6 - 7 days after the seeds are put in the mix they are transplanted to the patch under hoop houses, which are 7 ft x 10 ft. We are growing three plants in 2015. Two will be planted back to back about five feet apart. The third plant will be about 30 ft from the back to back plants.

**JH** - I started eight seeds this year on Easter Sunday. In looking back at the season, we were fortunate enough to be here in Napa and good friends with both Gary Miller and Tim Mathison, amongst others. Although we don't usually go with all unproven seeds, we just had to go with two 2,032's, two 1,985's, a 1,894 and a 1,874. They were started in a preheated 85 degree ice chest and moved outside to the mini greenhouses a week later. We will start another eight or so and hopefully plant six. Going to be some tough decisions this year as to seed selection....hard to beat the way things turned out last year.

**BN** - I try to plant my seedlings outside by May 1<sup>st</sup>, so my seeds are started around April 24<sup>th</sup>. I use the paper towel method to germinate my seeds, then they go to the grow pots, and into an 85 degree hot box until they pop through the starting mix. It takes one or two days before I feel they are ready for no heat and just grow lights. My young plants are watered very cautiously. Most growers loose seeds because of over watering. If you can pick up your starting mix with two fingers and squeeze water out of it, then that is too much. I will grow 6 plants this year. Two plants per site and choose the best one when they start to vine.



Pete Glasier 2036 Pounds

## Pollination

**P&C** - We like to have least ten feet of plant before the fruit at pollination time. Ideal for us is 12 to 15 feet. We like to pollinate between June 15th & the 30th. Usually by then the plant is large enough to give the plant a good start.

**JH** - This last year the weather was so warm early the plants literally just took off and I had females on the main ready before I was. I could barely keep up with the burying of vines for the first six weeks or so. I like to have at least 8 side vines and the plant as big as possible at pollination. Our plants actually took to pollination a little late, but it was still before the 1st of July. I still like the June 15th - 25th target and on our two big pumpkins I actually culled 30" to 35" pumpkins that were in that window. Both big pumpkins were at least 16' out. One thing I have noticed the last couple of years was the smaller size of the fruit at ten days....both pumpkins were only 16".

**BN** - How early is too early? That is the real question. When I first started growing, the magic date was July 15<sup>th</sup>. Look how that has changed over the years. I like to pollinate by mid to late June. The 2008 pumpkin was pollinated on June 24<sup>th</sup>. I want my pumpkin to be 10' to 15' out and pollinate 2 or 3 pumpkins. I look at the shape, number of lobes and growth rate of the small pumpkins.

## Plant Size & Pattern

**P&C** - We have been using a spider pattern. Our plants are around 800 to 900 sq ft. At pollination time they are about 300 sq ft. give or take. This would be about 40% of the final size but that figure could vary.

**JH** - I grow to the Christmas tree pattern due to the size of our patches...25' wide by 30' deep. The side vines seem to be right on the verge of termination at time of pollination. Probably covering two thirds or 500sq.ft of the allotted space.

**BN** - 1000 sq ft. I use the Christmas tree pattern with the first two side vines angled backwards.

## Fruit Covering

**P&C** - We build a hut over the pumpkin. The huts are made of PVC pipe covered by a tarp to keep the pumpkin shaded and dry. We have experimented with blue tarps and white tarps. We think using white tarps may keep the fruit cooler. We do not use shade cloth on our plants. We keep them cool with mini sprinklers which are on a timer. During hot weather the sprinklers run about ten seconds on and two minutes off.

**JH** - Once the pollination sets the pumpkins are covered. At first with wire hoops and used white fertilizer bags and then when they get bigger I erect hoop houses. I water mostly with misters and I have found it very, very important that no water at all hits the pumpkin... stem or blossom ends. I will leave sheets on the pumpkins and blankets on cool nights. The plants are usually OK as long as the misters and timer are working. I did have some mishaps with timer issues, and it always seemed to happen on the hottest days.

**BN** - My pumpkins never see sunshine. I build a tent over them and use a plastic tarp to keep them dry and shaded. Inside the tent I put fans on the stem, to keep it dry until harvest. I have one a piece of shade cloth that I put over my best plant for hail protection only. I never use it for shade. I feel this hurts the growth of the pumpkin. Why lose the best growing days of the summer by covering your plant. I also spray my leaves when it is extremely hot to cool them. Just make sure you run the hot water out of your hose before you spray them.

## Fertilizing

**P&C** - We fertilize with hose end sprayers once a week. We apply seaweed, essential and companion. After fruit set we add 3-18-18. We feel this foliar feeds and gets the fertilizers into the soil. We also applied tarantula and white shark to promote more root growth.

**JH** - I buried vines with a mixture of Mycos, rootshield and powdered Azos...1 cup to 1/3 cup to 2oz. I prefer foliar applications always including Companion and Essential as a base. Some of the other products I used were 10-10-10, Recover RX, Cal-Mag Max and a little bit of bio nutrients. Looking back at this last year I used 1 1/2 gallons of Companion and good gallon or so of Essential.

**BN** - I like to add fertilizer during the season. The pumpkin is growing so fast that it just wears the plant down. I feel a healthy plant is the key. It takes fewer fungicides and has better late season growth. I use growth products like Neptune's Harvest and my own compost tea throughout the season. Ron Wallace uses growth products and I just followed his recommendations. May through the first part of July, I foliar apply Cal Mag Max once a week at 4 oz. per 1000 square feet. Starting July 15<sup>th</sup>, I apply 5 oz. per 1000 square feet of TKO phosphate 0-29-26 and 3 oz. 0-0-25 liquid Potassium. I also apply Neptune's Harvest every Sunday with 50 gallons of my compost tea on 6000 square feet. The biggest help for me this year was a mid-season tissue test. It told me exactly what I was lacking.

***How they did it!***



# Watering System

**P&C** - We use overhead mini sprinklers for watering. We also hand water to get any dry spots missed by the sprinklers. This seems to work well in our Napa weather.

**JH** - We are fortunate enough to be on a well and I use a mister system on a loop timer for the bulk of my watering.

**BN** - My watering system is drip tape with hand overhead water on hot days.

## Watering

**P & C** - We are lucky if we get an inch of rain all summer. Our rainy season comes in the winter months but the last few years we have experienced a severe drought. Our water source is from the city. We try to water enough to keep the soil moist, not wet as too much water can lead to rotten roots and vines.

**JH** - We had several days in the nineties, so we had to check the weather each morning and set the misters, hoping we get it right. I would generally run the misters from 11am or so up to 4:00 or 4:30, mostly every 2 minutes for ten or twelve seconds. I have to be very careful with Powdery Mildew so I never watered after that time each evening. I did have several hoses and I would put a wand on the ends of them, leave them running and just keep rotating.... trying to get the outside area of the canopies that were not getting enough water.

**BN** - I run my drip tape twice a day, applying 50-70 gallons per plant per day. We had a wet year, so I watered according to what the plant needed. My water comes from a spring with a 1500 gallon holding tank.

## Weed Control

**P&C** - We weed by hand. We have several different hoes for weeding. The winged weeder, the hula hoe and a Dutch hoe. We have found that if you let weeds go to seed you are in big trouble, especially in our case where we cannot rotate patches. Napa

has a very moderate climate and weeds can germinate year round.

**JH** - Yep, I weeded the entire patch by hand....best I could.

**BN** - For the last 5 years or so, I have used one year landscaping cloth in my watermelon patch. Last year, I tried it with my pumpkins. I put one 3' strip of landscaping cloth down each side of the main vine. Now comes the trade-off. You must cut small slits under your leaf stems to allow the roots to get the dirt. The melon roots will grow through the cloth, but the pumpkins roots are just too big. I put a small amount of dirt to encourage root growth, but I don't bury vines. The rest of the plant gets hand weeded.

## Pest & Disease Control

**P&C** - Insect pests are thrips, aphids, cucumber beetles and squash bugs. We use Bayer 3 in 1 for insect control. We sprayed a few times with a garlic concentrate as it seemed to work for Tim Mathison in 2013. Squash bugs are hard to kill with insecticides so they are hand-picked. Powdery mildew is a big problem in our patch as it is fenced and does not have good air circulation. We use neem oil and daconil and START EARLY. If you wait until you see signs of powdery mildew it is much harder to control. In 2014, we started spraying on May 29th and we sprayed a record 17 times. We had very little powdery mildew in the 2014 season.

**JH** - I had more pests this year than ever. It started very early this year with thrips. I think it had something to do with the unusually warm weather we had in early spring. We had just an ongoing battle with the thrips all year, also cucumber beetles, aphids and squash bugs for the first time. Later in the season we also get pretty good pressure with Powdery Mildew. The only way I got through the season was to get my hands on a backpack sprayer and hit them hard every three weeks or so with insecticides. As I said earlier we also used both Companion and Essential in every foliar application.

***How they did it!***

# Last Thoughts

**Pete & Cindi Glasier:** It is hard to narrow it down to two of the most important things that helped us reach our PB but we would have to say seed selection and soil prep rank at the top, closely followed by the weather and of course grower input. We would like to thank the **GVGO** for granting us this interview and wish everyone a personal best in 2015.

**John Hawkley:** What helped me this year? Not sure, but first, my wife. Anyone that is serious in this sport knows the amount of work and dedication it takes. Staying behind on weekend outings, never coming in the house until dark every night..... This all takes a huge amount of support. Second just has to be mentors, considering I have only been growing for six years, I consider myself still somewhat new to the sport and having all the accomplished growers that we have in Napa.... is just a blessing. On a side note, the two 2,000 plus pumpkins that we grew this year were both grown on the new area in our patch..... Is this a coincidence?

**Bill Neptune:** What did I do better this year? A lot of people have asked me this question. I think for me, it was using less fungicide and insecticides and keeping my plants healthier. I applied compost tea every week along with growth products (TKO). I did a tissue test mid-season and it told me what my plants needed to stay healthy.

*Congrats again on a wonderful season. Thanks again for all your help with this interview. Enjoy the off-season. Cheers.....Phil & Jane & all your friends at the **GVGO***

***How they did it!***



**The modern Giant vegetable grower will supplement his or her grow op with an assortment of biological means to assist growth. These would include the bacteria bacillus subtilis and the nitrogen fixer azospirillum. Two fungi Glomus Intraradices (GI) and Trichoderma Harzianum (TH) are often added to the soil, GI is a mycorrhisal fungi that promotes a symbiotic effect and enhances root health and growth.**

**Growers: take your golf clubs into the patch**

**Soil testing** does not always revolve around a soil test. Here is very practical and cost effective way to test your soil for depth and compaction. Simple find a golf club and remove the head with a hack saw now you have a soil test probe.

Insert the probe straight down into the soil into. The probe should meet very little resistance for 18 to 24 inches. Anything less than 18" requires soil additions or deep tilling to loosen the lower layers. **FOUR!**



# Pumpkin Roots & Icebergs ...What's the Connection?

By: Joe Ailts



Scientists have determined that ice is roughly 90% as dense as water, and as such, 90% of the mass/volume of an iceberg is submerged. Sailors over the ages, most notably the crew of the *Titanic*, have recognized that when it comes to icebergs, what you see is only a fraction of what you get. So what does iceberg density have to do with our beloved hobby of growing giant pumpkins? The iceberg scenario serves as a cool (no pun intended) metaphor for comparing the root systems of pumpkins to the above ground vegetative growth.

***“the root system of pumpkins can be compared to an iceberg”***

Pumpkins grow a central taproot; however primarily display a “fibrous” rooting structure. The degree to which seedlings emphasize root development in the early stages of growth may be underappreciated due to the fact that most of this activity takes place underground and detached from our observational capabilities. Further investigation reveals some striking features of the just how “iceberg-like” the giant pumpkin root system is.

***“Pumpkins grow a central taproot, however primarily display a “fibrous” rooting structure”***

A pumpkin seedling was germinated in a 3” pot on a growing mat at 75 degrees F in traditional seed starting mix with no additives. At seven days, the seedling was removed from the pot and an investigation was undertaken to quantify root system development. As

the picture below shows, the seedling had not yet reached the stage where the cotyledons had unfurled.



The height of the above-ground vegetation was 2.5”. 35 lateral roots were harvested from the central 2.5” taproot. ***Total root length of the taproot and lateral roots summed 78.25”, which converts to 6.5’ For emphasis, six-and-a-half-feet!*** As a function of length, roots account for more than 97% of the plant at 7 days. This crude measurement fails to take into consideration the incredible collective length of microscopic root hairs (visible as branches on the lateral roots in photo below). It is these tiny root hairs that are the plant’s vacuums for water and nutrients essential for growth.



A word of caution here, if these root hairs are damaged, as can easily happen during transplanting and weed tilling, they do not grow back. Thus, it is important to handle transplants with utmost delicacy and minimize root system disturbance throughout the growing season. In summary, it is impossible to know how extensive the root system becomes throughout the season, but we can be assured that just like the iceberg, what you see above is only a fraction of what exists below.

***Happy Growing!***

# Root Tid Bits

Enhancing aeration and drainage of the soil's deeper layers provides many benefits. Well aerated soil fosters good movement of water and nutrients through the soil during heavy periods of irrigation. Excess water is easily removed while better, drainage, and leaching results in less saturation.

- ✚ Roots thrive as deeper aeration allows roots and soil microbes to respire easily.
- ✚ Soil resists erosion by wind and water
- ✚ Soil resists compaction and crusting
- ✚ Enhanced soil storage of Oxygen, Water and Nutrients in the soil and their availability to crops
- ✚ Good movement of water and nutrients in and through the soil during irrigation, drainage, and leaching.

Practices that increase the amount of organic matter and aid in drainage conditions and improve soil structure benefit plant roots.

- Adding all types of well rotted manures
- Adding of types of broken down composts
- Amendments that include vermiculite, perlite and calcined clay.
- Double digging to relieve compaction
- Deep tilling such as sub soiling to loosen the boundary layers below.
- Trenching to channel off surface run off
- Installing weeping tile to remove sub-surface water accumulations

Retaining good sub soil structure is just as essential to sustaining long-term pumpkin productivity as is amending the upper soil layers with organic matter.

Good soil sub structure means that restricted aeration and drainage do not limit a plants total root mass. Ensuring that the sub soil is suitable for maximum root growth and penetration provides a plant that is deeper rooted and is better able to withstand climate fluctuations.

## Open up the sub soil

Opening sub soil pore space results in lowering root harmful anaerobic concentrations of stored water and nutrients in the boundary between the soils upper and lower layers.

Soils with good structure allow air, water, and nutrients to move through the large pore spaces within and between aggregates. They also retain their ability to resist compressive forces when exposed to the stresses of cultivation, harvesting a pumpkin, the impact of raindrops, and foot traffic of the grower.

**In the pumpkin patch years of adding organic matter often results in stratified layers of soil. The upper layers consisting of richly amended organic matter while the lower substructures often contain clay. Soils commonly become stratified into these layers due to several years of amending with organic matter and shallow tilling.**



# Pollination, Heat and Cell Division

**By: Brad Wursten**

So what really happens when you pollinate a flower on your pumpkin, cucumber, tomato or any other fruit for that matter?

After pollination, the first thing that happens is the development of an embryo. Shortly after, seeds start to form. This process continues till the fruit is ripe. Once seeds begin to develop, cells begin to divide. This process is not really long, but the right conditions can prolong it, leading to heavier fruit. Once this process stops, the existing cells begin to expand.

## Pumpkin Growth in Two Phases

1. Cell Division
2. Cell Expansion

### Cell expansion

Cells in various regions of the fruit often enlarge at different rates and in different planes. Simply put, cells can divide in several directions such as vertically, horizontally (lengthwise or width wise) and radial. In scientific terms we speak of longitudinal, radial and tangential expansion. Marrows and cucumbers are great examples of fruit where the cells mostly develop longitudinally. Pumpkins tend to expand radially as do other round fruit, like tomatoes.

***“The weird thing is ...smallest cells are on the outside of pumpkins and largest on the inside”***

That being said, pumpkin cells can divide in any given way, producing anything from a wide, flat pumpkin to a wheel-shaped one. The ultimate shape of the pumpkin is more or less determined in this stage. The weird thing is that the smallest cells are on the outside of the pumpkin and the largest on the inside. As various cells divide and grow differently, wall thickness can also vary, depending on its position within the pumpkin. The density also diminishes from outside to inside. For these reasons, OTT charts will never be accurate.

### Pollination

Shading, heating and sinks play an important role in pollination. Some studies suggest not shading fruit (completely dark) during the first few days after pollination as it leads to the plant aborting the fruit. Heat can also cause fruit to abort. One of the most important reasons for the plant aborting a pumpkin is a fight for dominance. Experiments have shown that reducing the amount of plant growth helps prevent fruit aborting, but more importantly, the first fruit pollinated is so dominant that it will often cause younger pollinations to abort. It seems that this dominance lasts on average about 12 days. After this period there is less risk of aborting.

***“One of the most important reasons for the plant aborting a pumpkin is a fight for dominance”***

### Heating

Heat is one of the major limiting factors in fruit size. Cell division is affected by high temperatures. It will actually stop the process. In tests, tomatoes exposed to more than average heat (but below the heat stress border) during the cell division stage, ended up with less cells in the mature fruit. This is because the fruit was coaxed into cell expansion instead of producing new cells. In tomatoes it led to a reduced cell number but increased cell size. In cucumbers it led to a reduced cell number but no increase in cell size, meaning much smaller cucumbers.



Dominance plays a very important part in the entire life cycle of members of the cucurbit family including cucumbers and pumpkins.

# Pumpkin Growing Products for Sale

From John Nieuwenhoff

Money raised from the sale of these products are used to help run the Erin Fall Fair Giant Pumpkin Weigh off.

For a full description and directions of products please go to

[www.ErinGiantPumpkinGrowers.weebly.com](http://www.ErinGiantPumpkinGrowers.weebly.com)

## FOLIAR APPLIED PRODUCTS

**SiTKO**— 0-7-17— A Silicate, Phosphite, and Salicylic Acid combination product from Growth Products. Cost—\$15 for 1 Litre bottle.

**TKO Phosphite**—0-29-26—Source of P from 100% Phosphite from Growth Products. Increases root mass, helps control powdery mildew naturally, reduces summer stress. Cost—\$20 for 1 Litre bottle.

**Recover Rx**—3-18-18—Contains Phosphite and Salicylic Acid (Trigger SA). A great all season foliar from Growth Products to help keep your plants healthy. Cost—\$10 for 1 Litre bottle.

**Nitro 30 SRN** - 30-0-0- This 85% slow release Nitrogen from growth Products is great for those crops that require lots of high quality Nitrogen. Cost - \$10 for 1 Litre bottle.

**Micrel Total** 5-0-0 Micronutrient Package- The total micronutrient package contains Magnesium (Mg) .5%, Sulfur (S) 4%, Boron (B) .02%, Copper (Cu) .5%, Iron (Fe) 6%, Manganese (Mn) .5%, Molybdenum (Mo) .0005%, Zinc (Zn) .5% from Growth Products. Cost - \$10 for 1 Litre bottle

## SOIL APPLIED PRODUCTS

**Soil Restore Plus**—3-0-2—All kinds of great stuff for your soil. Contains 10% Humic Acid, L-Amino Acids, and food for soil microbes. Rejuvenates soil structure, helps reduce compaction, and solubilizes minerals in the soil and releases bound-up nutrients. If I were to use one soil applied product, this would it. Cost—\$20 for 1 Litre bottle

**Soil Life**—A blend of seaweed, carbon, yucca extract, plus a proprietary blend of other soil improving amendments and micronutrients including IGNITE by Agri-Gro. Helps improve soil structure, revitalize depleted soils, feeds beneficial soil microbes, and promotes a healthy soil environment. Very similar to Essential Plus from Growth Products but this is blended locally and made fresh. Cost—\$25 for 1 Litre bottle

**MYKE PRO TURF-G** -GranularGlomus intraradices mycorrhizae from MYKES. Our Mykes is never frozen, always fresh and stored in a cool dry facility. Cost—\$20 for 5 pound bag

**MYKE PRO WP** (wetttable powder)- This high concentration mycorrhizae powder (800 spores/gram) can be watered in to the soil wherever roots are to inoculate them and promote more nutrient and water uptake in the plant. Cost - \$15 for 100 gram bag

**Granulated Compost**- This easy to spread granulated compost is made from a mixture of turkey litter, worm and plant compost, humic acid, and kelp meal. Cost - \$30 for an 18KG bag

*Over The Top*  
**Gardener's Journal**





**GVGO**

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## The Major Pitfall of Indoor Growing

Rocco Brewer's BEST growing tip of spring 2015.

### CO<sub>2</sub> in Patch Soils and Hoop Houses.

Pumpkins growing in hoop houses may be subjected to low CO<sub>2</sub> levels. Enclosed hoop houses may be problematic. A common condition can exist when early morning leaf respiration may reduce CO<sub>2</sub> levels far below atmospheric levels. The result can be slowed growth and stunted plants and poor fruit weights.

Some patch soils in hoop houses that are low in organic matter release far less CO<sub>2</sub> into the air via the decay of micro-organisms in the soil.

The best way to mitigate low levels of CO<sub>2</sub> and enhance plant growth is circulating air movement and air exchange around the leaf surfaces and or ventilation and or with CO<sub>2</sub> supplementation of the plants atmosphere.

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## Prince Edward County Pumpkin Growers 2014-15 Seed Catalogue-Revised

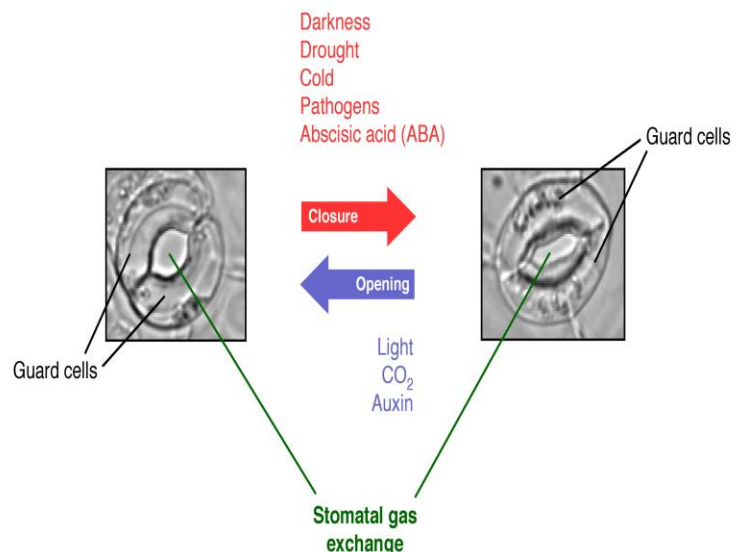
The Prince Edward County Pumpkin Growers 2014-15 fund raiser. All proceeds go directly to our weigh off in Wellington. Two seed packages available, a pumpkin seed promo and a squash seed promo. In addition, a limited number of proven and promising seeds for sale individually. All Prices in Canadian Dollars. For our American customers, the soft Canadian dollar will give you additional savings of about 20%.

Pumpkin seed promo pack includes 17 seeds comprised from the top pumpkins weighed at Wellington in 2014, along with other top pumpkins from Ontario seeds. Each set is \$55.00 Cdn, plus \$5 per order shipping and handling for a total of \$60. That's less than \$4 per seed folks! There are also a few packs left of the 2012 and 2013 offering at the same price. **BONUS\*\*** Get a free T-Shirt with seed orders over \$200!

To order seeds or Apparel, please send an e-mail to John Vincent at: [j.vincent@xplornet.ca](mailto:j.vincent@xplornet.ca) or phone: 613-921-7961 Cheque or money order, and the total of your purchase, or if you prefer a PayPal invoice will be issued. We also accept e-transfer. Remember to add \$5 per order for S&H.

Cheques and money orders should be made payable to: PECPG and mailed to:

**The PECPG Seed Sale**  
c/o John Vincent  
1538 Cty Rd 15  
RR#2 Picton, ON  
K0K 2T0. Canada



# Controlling plant stress boosts yields while slowing senescence of plants.

By: Russ Landry

The growth of the plants depends upon the expansion of meristematic tissues near tips of roots and stems. Left unchecked this type of growth would signify unlimited vitality and fountain of youth like qualities of the plants continuing life on earth. There would be no need of evolution or for that matter survival of the fittest. Nature as always has a way and senescence of plants or the decline of the vibrant growth period due to aging sets the stage for the dawn of a new genetic generation of seedlings. Plants do indeed die however death is not the ending. More likely it is the beginning or a renewal and it is nature's way of letting genetics advance adapt to life here on earth.



www.authorstream.com

***“Plants do indeed die however death is not the ending”***

It is no secret that plants can die from environmental stress. Growers see this all the time in living color as brown crisp leaves often threaten the harvest potential of plants. However, the master key to unlocking the true epigenetic potential of a crops yield is often

found in increasing the growth curve of its fruit. Delaying or prolonging senescence hinders the [death](#) spiral that harms yields. It is an age old challenge that is the grower's most elusive enemy.

There are various and numerous types of senescence, the gradual decline to death may occur in only certain forms of cells, tissues, limbs, or the entire plant. Xylem cells may begin to constrict pathways by dying and slowing or halting importation of vital fluids sent to the fruit. Leaves typically have a maximum life span and may function as an exporter of photosynthetic products for only a short period of time. Whole root or shoot systems may slowly die back as the plant reaches its natural maturity. Ultimately the complete plant may die after a seasonal period of growth has resulted in the completion of seed production and its procreation has been ensured. This characteristic is initiated in many types of annual plants living out their life cycle in a single brief growing season.

The demise of leaves and of the plants shoot systems is considered a normal part of acclimatization to the cycle of the seasons and finally to the completion of life itself. The surrender of the parent to senescence does contribute to the future success of the next seedling in fostering and sequestering away essential nutrients that may be required to start another life. The next generation is then carried on by seeds inside the developing fruit.

***“Xylem cells may begin to constrict pathways by dying and slowing or halting importation of vital fluids sent to the fruit”***

Slowing senescing plants into this downward trend is a critical factor in boosting harvest yields. The longer a period of time a particular organism can continue to actively grow often provides a greater fruit potential and boosts yields. The Richmond Lang Effect often holds true in that the delay of senescence of leaves and other organs of the plants by cytokinins can be controlled somewhat. Cytokine's are concentrated amounts of plant growth regulators (PGR's) or hormones that stimulate plant cell division.

Certain foliar applications of these products have been shown to delay the onset of senescence. The cells degenerative changes linked with the accumulation of bi-products or metabolic changes can be slowed when treated with these products. Kelp and other sea plants also contain relatively



concentrated amounts of plant cytokinins, auxins, and other growth regulators. When applied regularly they can extend life or lengthen the effective growth curve and drive up yields. This is accomplished by foliar applications that promote shoot and root growth which can provide for an expanding plant architecture that is more resilient to change.

***“Cytokine's are concentrated amounts of plant growth regulators (PGR's) or hormones that stimulate plant cell division”***

Kinetin is a type of [cytokinin](#), [plant hormone](#) that promotes [cell division](#) and growth. It is currently sold commercially under many trade names in mostly synthetic forms. The cytokinin is usually applied to blossoms to induce fruit set. Kinetin increases the yields of annual fruits and vegetables, often producing seedless fruits, and increase in budding of herbs. Regular foliar sprays of cytokinins will extend growth and life by fostering the development of fresh new adventitious roots that readily absorb nutrients.

So we have seen how important it is to control the above ground conditions while supplying plant growth regulators. However enhancing the rhizosphere or root zone pays huge benefits as well in delaying senescence. Growers who ensure adequate availability of moisture and solubility of nutrients in the soil solutions can prolong the plants life as well. Excessive moisture levels in the root zone reduce oxygen concentrations in the root zone and can hinder the exchange of nutrients. Saturated soil promotes roots that shelter themselves from the elements as they form a waxy like surface upon them called suberin. The cork like layer shields the damaging effects of increased moisture stress and it in turn lowers yields dramatically.

***“Enhancing the rhizosphere or root zone pays huge benefits in delaying senescence”***

The death of individual cells in tissues such as the xylem appears to be controlled by internal factors, but senescence often depends upon a steady state. Plants need a constant micro climate that is harmonious to life to keep producing. Sink Source Relationship or the redistribution of nutrients to actively growing parts of the plant includes the roots, shoots & fruits. This relationship is greatly affected by the climate of the day. Xylem pathways leading into the fruit during development have been shown to be harmed irreparably by drought. Plants in drought stress react by reducing the function of

xylem channels hindering the transport of water and nutrients into the developing sinks.

Drought is a most serious environmental factor; it limits plant productivity and greatly reduces yields. Buds and fruit exposed to these conditions rush headlong into the death spiral as this accelerates leaf and plant senescence. This is necessary to complete their life cycle and ensures the viability of the next generation. Each stress event is cumulative and further damages future potential yields. The drought condition is interpreted by the plant as a challenge to its impending procreation. Not only is it critical to control these cumulative conditions, the effect of event moderate drought stressors can damage xylems and often leads to fruit poor set, cracking, pitting, splitting and blossom end rot as well as poor overall fruit quality and taste.



**Drought Stress**

<http://www.omafra.gov.on.ca>

Plants can use a variety of differing means to avoid, survive or function in drought stress. For example annuals can mature quickly in a fast paced shortened life cycle that becomes compressed. High rates of growth during the early warm season may allow them to avoid drought entirely. Stomata may close tightly to reduce evaporative water loss; this modifies sink/source distribution by increasing root growth in search of moisture. Decreasing the size of canopy leaf structures reduces growth of new above ground shoots and this slows the increasing demand for water. These diversions however will accelerate leaf and plant senescence. Plants employing these strategies ensure their survival and the completion of the life cycle. The tradeoff is this reduces the ultimate harvest yield of the plants.

Normally in most plants the xylems pathways leading to fruit will close by the fruits half life. This is thought to occur as it protects the developing seeds from the damaging desiccation effects of drought. However if xylem function decreases ahead of this time period the result is fruit that are left with a meager supply of nutrients like calcium and boron that are commonly transported only in the transpiration stream. Blackened, shrivelled and splitting distal ends of tomato fruit are prime examples of plants left without adequate sink xylem distribution pathways.

Foliar sprays of **maple bud syrups and ascorbic acids** are extremely important since they contain a vital anti-oxidant enzyme called Superoxide Dismutase (SOD). Amazingly this enzyme is thought to disarm DNA damaging free radicals. Damaged DNA causes replication errors in cells and plant tissues and can hasten senescence or death of the cells increasing the risk of plant disease. SOD is thought to be a powerful ally in reducing the effect of free radicals. These age causing mutations damage the DNA within the cells often shutting down plants early and stunting growth.

***“Damaged DNA causes replication errors in cells and plant tissues and can hasten senescence or death of the cells increasing the risk of plant disease”***

Ethylene gas is also a significant natural [plant growth hormone](#) (PGR) that can shorten the growth curve of plants. It is used in agriculture to enhance and force the ripening of fruits and certain vegetables. It operates at low ppm trace levels during the life of the plant. Ethylene promotes or controls the [ripening](#) of [fruit](#), the timing flowering, and the shedding of [leaves](#) as well as [senescence](#) of vegetative tissues. The production of ethylene gas in plants can also be induced by a large range of factors from temperature extremes to external wounding and other environmental stresses, including excessive wind damage. Compost piles also produce ethylene and should be located at distance from tender crops so as not to encourage early onset of Senescence. Limiting the exposure to the gas helps to ensure life of the plant is prolonged.

The plant's challenge is to complete its life cycle while fully achieving the future vitality and vigor of its offspring. For the grower the challenge is to extend out the effective growth curve of the plant. Delaying the inevitable onset of senescence thereby slows the signal of urgency in the need to complete the plants life cycle. Growers who employ these control factors and harmonize the growth climate of the plant contribute to forever increasing Maximum Yields.

## Pests

# The Cabbage looper

The cabbage looper is a member of the moth family. It is found throughout all of North America, parts of Africa and most parts of Europe and Indo-Australian region.



The caterpillar, a measuring worm, is smooth and pale green with white stripes and is one of a many species called cabbage worm. It is called a "looper" because it arches its body as it crawls, inchworm-style. This species is very destructive to plants due to its voracious consumption of leaves. It is not restricted to cole crops; other plant hosts include tomato, cucumber, collard greens, and potato. The adult of the species is a nocturnal brown moth.



# Delectation of Tomatoes

**Dale Thurber** had been an avid gardener from an early age. He was fascinated by Gordon Graham's world record 7.75 lb. "Delicious" tomato grown in 1986. So off and on for the subsequent 23 years he tried growing big tomatoes. He tested out all the "giant" varieties from all the big seed companies. Dale was never able to manage anything over one pound when in 2009 he stumbled upon the book Giant Tomatoes by Marvin H. Meisner, M.D. Now that was a major turning point, a life-changing tomato event! Finally realizing that the big seed companies didn't even offer the right genetic material for growing giant tomatoes, he set out to secure some seeds with REAL potential to grow big giant tomatoes.

## Giant Tomatoes

By: Marvin Meisner

In early 2010, Dale won an online seed auction at Perry's Greenhouse and received seeds from several 4+ lb. tomatoes grown by Duane Perry of North Lawrence, Ohio. These included Belmonte (4.14), Church (4.48), and Big Zac (4.83) - this Big Zac being offspring of the famous Timm 5.58 and sibling to Harp 7.18. With these seeds and Dr. Meisner's book in hand, he started his quest to grow giant tomatoes

In 2010 he established a Utah State Record of 2.762 lbs. from the 4.83 Big Zac seeds. He later joined up with the Utah Giant Pumpkin Growers (one of the most active GPC chapters in the world), growing giant pumpkins and promoting giant tomatoes. Within a year, he was offering seedlings, seeds and fresh tomatoes locally.

By 2011, Dale had started a small micro-farming business, **Delectation of Tomatoes, etc.** which, he laments, "it has totally taken over my life". Initially, it was all about sharing seeds and seedlings from documented giant tomato varieties with as many people as possible. Now, four years later, he has an

inventory of over 1,600 tomato varieties, 350 pepper, 80 melon, 50 bean, etc., with seed customers from more than 50 countries from around the world.

**"Seeds from documented giant tomatoes are my best sellers by far"** he says. His website is [www.gianttomatoseeds.com](http://www.gianttomatoseeds.com) and he maintains a list of all the largest document tomato specimens by variety at: [The Big Tomato List](#).

In 2014, he started cross-breeding different varieties of giant tomatoes (such as is commonly done with giant pumpkins), hoping to help improve the genetics towards breaking that 10-pound barrier for tomatoes!

Since 2010, Dale has broken the Utah state giant tomato record eight times, with the current record standing at 4.760 lbs. In 2014 he managed to raise 85 tomatoes to over 2 lbs., representing 28 different varieties! His seed packets give detailed information about lineage, average weight and history. Here is an example from his two largest:

### ***TOMATO* - DOMINGO**

4.647 lb.\* 9-17-2014

Amazing producer of extra large tomatoes, often 2+, up to 6 lbs.; clear skin. Vincenzo Domingo who introduced this variety to North America, has grown 4 tomatoes on a single truss with a total weight of 20 >lbs.! Sadly, Vincenzo passed away in Dec. 2014. Good flavor on regular leaf, indeterminate vines; 71 days. Family heirloom from Castellammare del Golfo, Sicily, Italy.

\*Utah state record heaviest tomato (for a while).



### ***TOMATO* - BIG ZAC (F3)**

4.670 lb.\* 11-04-2014

The "BIG ONE"! Prolific producer of big, at times GIANT red tomatoes; juicy with sweet, very good flavor. Indeterminate, regular leaf vines, good yield from 80 days. From 3.75 Catapano 2007 ← 4.59 Lyons 2006.

\*Utah State Record



Dale suggests that anyone serious about growing giant tomatoes needs to study the Giant Tomatoes book and participate in the online giant tomatoes forums at [The Tomato Depot](#) and [Big Pumpkins](#). And of course he's glad to share seeds from the best and biggest of the tomato world!



As a brief overview, here are five suggestions he gives for growing giant tomatoes:

**1. SOIL** - Lots of organic matter - feed those roots!

Nearly all the world's top giant tomato growers are, or were, also giant pumpkin growers, and use essentially the same soil formulation for growing huge tomatoes.

**2. GENETICS** - Unlike pumpkins, we're dealing with several varieties of tomatoes with potential to push the upper limit; Select varieties and specific lines that have been proven to produce lots of megablossoms (fused blossoms) and multiple 4+ pounders.

**3. PRUNING** - Be aggressive! A single main stem, prune off all suckers and old leaves, and prune off all other small tomatoes and blossoms once you've selected the most promising tomato, which should result from the most impressive, massive megabloom on one of the early trusses. And top off terminal growth once the tomato starts growing well - the new world record was grown on a vine less than 3' tall!

**4. CLIMATE** - Tomatoes grow best when the temperature is between 70-85° F, so a combination of growing under plastic (for May to mid-June and September until frost) for warmth, and under shade cloth during the heat of summer will help keep tomatoes growing quickly but not ripening too fast. Steady watering is a given - especially keep that top 2" of soil moist (but not soggy), as that zone is where the fine feeder roots take up a high percentage of calcium and other nutrients.

**5. FOOD** - Just as with pumpkins, vines that have produced 5+ lb. tomatoes have been fed a regular diet of Xtreme Gardening products, Dunkel's Tomato Turbo, Voodoo juice, compost teas, and other products - and absolutely don't forget the mycorrhizal fungi from the very beginning.

## Ten Pound Tomato here we come!

### Gibberellic Acid, Auxins, Cytokinins & Fruit

- **If** > G.A. sets the staging
- **And** > Auxins build the pipes
- **Then** > Cytokinins build larger pipes (more cells) and keep the machine rolling while delaying death or senescence.

When plants began to appear and evolved on Earth, the atmospheres carbon dioxide (CO<sub>2</sub>) concentration was much higher than it is now. The CO<sub>2</sub> concentration was higher than 1000 parts per million (ppm). Today, the average CO<sub>2</sub> concentration in outdoor air is nearly 400 ppm on the planet's surface.

Therefore most, plants will grow with higher CO<sub>2</sub> concentrations. Through photosynthesis, the carbon in CO<sub>2</sub> is taken in by the stomata and takes part in the building of leaves, stems, flowers and fruits. Proper CO<sub>2</sub> concentration from early growing to fructification allows for faster maturation and larger yield. Many indoor growers supplement garden with CO<sub>2</sub> during photosynthesis to supply plants with this essential cell building material.

*Over The Top* is published each  
spring, summer & fall.

Produced by Editor: Russ Landry

Major contributors to the growers vine

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Phil Joynson, Brad Wursten, Joe Ailts.**

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# GVGO

# Plant Protection

**Manganese deficiency confirmed by  
tissue tests**



**Photo by: Theresa Reid 2014.**

## Foliar feeding

**Special GVGO News**

The causes of the Manganese deficient leaves above are often a very common patch problem in Ontario. They may be caused by the follow soil conditions.

- **Soil pH:** High soil pH reduces Mn availability while
- **Organic Matter:** High OM can tie up Mn.
- **Soil Moisture:** Waterlogged conditions can reduce available Mn.

Usually wet soil conditions in the spring are the cause of temporary tie-up of Mn availability in the soil. The condition can occur even if the soil is sufficient in Mn.

The best way to alleviate low plant tissue levels of Mn is by Foliar Feeding.

Mn is not translocated in the plant; deficiency symptoms appear first on younger leaves. The most common symptoms on most plants are yellowing and interveinal chlorosis.

**GVGO Memberships** run from January  
1st, 2015 - December 31st, 2015.

*Time to Renew*  
**GVGO**

## GVGO Sticky - Leaks

**Late Breaking News**

### Choanephora Rot or Wet Rot

Choanephora rot or wet rot is commonly a problem on young developing fruit under extremely wet conditions

Often during cool, wet weather the fungus may be splashed into newly developing female flowers and young fruit. 'Bread mold'-like symptoms will develop on infected flowers and fruit causing them to abort.

Choanephora fruit rot is favored by wet weather. Both blossoms and fruit are affected and fruit nearest the ground are more likely to become diseased. The disease is destructive; it is also as short-lived as the conditions that promote it usually are brief during pollination.

Subsequent fruit sets are usually not affected unless conducive conditions reoccur. Under optimal conditions, rapid infection of the disease and the conditions that promote it make control measures impractical.

# EUROPE

By Bradley Wursten

We usually don't get too much frost over here in The Netherlands, so work in the patch goes on pretty much all year. But winter is when I dive into the academic side of growing. In December I took part in a project at the University of Utrecht where academics met with amateurs. I met up with a biology professor specializing in microbes. Here are two things I would like to pass on from that meeting.

## 1. Mycorrhizae

For years I doubted the benefits of adding mycorrhizae to our fertile soil each year. That was confirmed. It already exists in our soil (and certainly if you have added it once before). When you pull the plant, spores remain behind and overwinter quite happily. Once new roots come into contact with the spores, the mycorrhiza grows again. The largest single specimen of mycorrhizae was recently found under an oak tree and measured one square kilometre.

## 2. Crop rotation

There are numerous types of microbes existing in our soil. Certain plants make use of certain microbes and built up a network. If you rotate crops, you break up this network and have to start all over. This is handy if you are trying to evade diseases, but otherwise it is better to keep the crop in the same spot each year (providing nutritional levels are correct), so that young plants can tap into the existing specialized network.

## Nova Crop Control

The Netherlands is without a doubt one of the leading countries in advanced agricultural techniques. An American pumpkin grower pointed my attention towards a company called Nova Crop Control in the southern part of our country which excels in plant sap analysis. Basically this is the difference between soil, tissue and sap testing:

## Soil

You test what is in the ground and (possibly) available to the plant but not what is actually in the plant itself.

## Tissue

You test what is in the plant but not necessarily what is available to the pumpkin.

## Sap

You test what is actually flowing through the plant and what is therefore available to the plant and the pumpkin.

So I contacted the company and they were quick to respond and granted me permission to share this (shortened) document with the GVGO. It's about a lot more than plant sap analysis and worth the read.

## PLANT SAP ANALYSIS

By Joan Timmermans & Maikel van de Ven

Since the 1950s plant sap analysis has been used as a tool to manage crop fertilization strategies and nutritional content. To produce a well-developed crop, a balanced uptake of macro- and micronutrients is required. When plants are able to take up all essential nutrients in the needed amount and in the right equilibrium they develop optimally and, as a result, are stronger and more productive.

By analyzing plant sap from the leaves, these plant nutrients can be monitored. This gives growers a tool and the ability to manage their plants' nutritional status and to improve plant vitality.

## Plant sap versus tissue test

Conventional tissue testing analyses the total amount of present nutrients in the dry matter of a leaf. These are the nutrients a plant has taken up until that moment. These nutrients are mainly complexed in the cell walls, etc. These complexed nutrients are not totally available for plant development at that moment.

A plant sap test gives a view of the nutrients which are available for the plant, at that time, for growth or development. A plant sap test is similar to a blood test.



# Nutrient uptake

When taking a closer look at nutrient uptake, there are several key factors that influence this process. Environmental factors such as temperature, light and soil conditions have a significant effect on the uptake of nutrients.

## Temperature

It is well-known that a lot of crops have difficulty taking up phosphorus when soil temperatures are low. Temperatures below 63°F can cause reduced mobility of phosphorus in the plant. Within a few days plants will show the first deficiency symptoms with older leaves showing purple discoloration. Nitrogen and magnesium deficiencies can easily occur during cold weather conditions in early spring when soil temperatures are low and plant activity is increasing. Even when there is enough nitrogen or magnesium available in the soil, the low temperature can inhibit these compounds from being available for root uptake.

## Light

Poor light conditions, caused by dark weather, can cause nitrate accumulation in leaves. As a result, necrotic or chlorotic spots can occur on leaves and plants start to take up too much water. The high water uptake is caused by the osmotic effect that is stimulated by nitrate. Quickly changing weather conditions such as increased irradiation combined with a rise in temperature can cause tip-burn in a lot of crops.

When crops suddenly have to start evaporating and the calcium uptake cannot keep up, new cells will contain low calcium. If then a moisture deficit occurs in periods with more dark weather conditions these cells are too weak to handle the increasing cell pressure; cell walls collapse, caused by a calcium deficiency. Leaf tips turn brown and will necrosis, which has a negative effect on the total photosynthesis capacity. Plants will be less disease resistant and the shelf life of fruits decline.

## Soil pH

Soil conditions, such as pH, can strongly influence the nutrient uptake of a crop. Changes in soil pH directly result in differences in nutrient uptake. High pH results in alkaline soils where elements like iron, manganese, copper and zinc are less available for root

uptake. In acidic soils plants will have difficulty taking up nitrogen, phosphorus, potassium, sulphur, calcium, magnesium and molybdenum. Between several elements there can be, depending on which elements are involved, an interaction in root uptake.

For example, potassium and calcium are strongly related as they are directly competing in root uptake; one of the reasons is because both are cations. High potassium concentrations will result in lower calcium uptake and the other way around.

## Plant growth stage

Another factor influencing nutrient uptake is the growth stage of the crop. In a vegetative stage plants need more nitrogen, phosphorus, calcium and magnesium. When the cultivation progresses and plants are starting to bear fruit, the need for potassium increases. In practice, growers often apply potassium to their crops too early, which results in a competition in nutrient uptake between potassium, calcium and magnesium. This leads to reduced growth due to magnesium deficiency and lower product quality because of calcium deficiency. Growers who regularly analyze their crops are postponing potassium applications until plants are fully in their reproductive growth stage which can lead to improved yields, both quantitative and qualitative.

Besides these growth stages the root system also has an effect on nutrient uptake. When developed well, crops will take up nutrients quite easily when levels in the soil are low. Poorly developed root systems are low in uptake, even when nutrient concentrations in the soil are high. Plant sap analysis can provide information that cannot be provided by a soil or substrate analysis. For each element it becomes directly clear if the crop suffers from a deficiency or an excess.

## Trace element uptake

When deficiency symptoms of trace elements appear, often the first reaction is to start applying higher concentrations. In most cases this does not have any beneficial effect on nutrient uptake, simply because the pH level in the soil is not optimal. A pH of 6.0 or higher will cause problems in uptake of manganese. Lowering the pH to 5.5 will make manganese, iron and zinc more available in soils, but then calcium, magnesium and potassium will be less available. Lower

calcium concentrations can result in improved boron uptake. To improve the uptake of other trace elements such as copper, lowering the pH only is not always sufficient.

After a pH adjustment it is still possible that high phosphorus soil concentrations can block pathways regulating trace element root uptake. In that case, lowering the phosphorus application is needed to create the possibility to activate these pathways.

## Sampling crops

Deficiencies in micronutrients are often accepted. They occur in periods of rapid growth; symptoms are often indicated as 'growth spots.' By analyzing plant sap it becomes clear which nutrients insufficiently present in the plant, before the deficiency symptoms will be visible. Direct action can be taken when analysis shows an approaching deficiency.

## Mobility of elements

Plant sap analysis also provides information about the reserves of different elements in the plant. Mobile elements such as potassium, magnesium and nitrogen are stored in the older leaves. When plants are taking up too little of these elements, the young leaves are relying on the older leaves for their potassium, magnesium or nitrogen supply. High concentrations in young leaves and lower concentrations in old leaves indicate that plants suffer from a lack in uptake of the specific element. Growers then can increase their nutrient supply specifically for that element.

Nova Crop Control, based in The Netherlands, is a laboratory specializing in plant sap testing. With experience in a wide range of horticultural and agricultural crops,

Nova Crop Control provides insight in the plants' nutritional status, quickly and accurate. The Nova Crop Control laboratory has been using the plant sap analysis for 10 years and have been offering the complete range of macro and micronutrient analysis in more than 100 different crops for the past five years.

Growers who manage their crop fertilization based on plant sap testing gain several advantages.

- Firstly, plants are healthier and less susceptible for plagues and disease; growers notice this

because the requirement to spray crops with fungicides and pesticides is decreasing.

- Secondly, fertilization applications based on the plant's demand can result in savings on fertilizers.
- Thirdly, nutrient deficiencies can be avoided before they start to cause severe visible damage to crops. This will increase the potential of plants which results in higher yields, both qualitatively and quantitatively.
- Lastly, growers can specify their fertilization program on the different varieties being cultivated, as plant sap testing will give an indication of the varietal differences in nutrient uptake. Depending on the growing period of the crop, it is best to analyze plant sap weekly for short cultivations or bi-weekly for longer cultivations. Growers then can follow the long-term progress of the nutritional status in plants precisely.

For more information about Nova Crop Control visit [www.novacropcontrol.nl/en](http://www.novacropcontrol.nl/en).

## Master Grower Levels

**Pumpkin - 1400 lbs**

**Squash - 1150 lbs**

**Long Gourd - 120"**

**Watermelon - 200 lbs**

**Tomato - 4.5 lbs**

**Cabbage - 60 lbs**

**Corn - 275"**

**Sunflower - 250"**

**Get your jacket soon!**

**GVGO**

## Cell Division, Fruit and Peduncles

**Two major themes have emerged over the winter months. The GPC Big Show has helped to bring them to the forefront as growers from around the globe continue to search for the answer to what drives the engine to bigger, heavier and better fruit growth.**

The first key was found in some humble research that was released this past December. The study by a group of scientist's studying AGP revealed that our plants have gained the ability to change their internal plumbing leading into the fruit. *The findings are really a revelation in that a bigger stem or peduncle is thought to control sink source strength and its relationship to the rest of the plant.*

*Plant Cell Environ. 2014, Dec 25.*

**The making of giant pumpkins: how selective breeding changed the phloem of Cucurbita Maxima from source to sink.** Savage JA Haines DF, Holbrook NM

*"Instead, giant varieties differed in their ovary morphology and contained more phloem on a cross-sectional area basis in their petioles and pedicels than the ancestral variety."*

So what exactly does this mean for growers? Well for certain we now understand that **the more cells a fruit and its appendages have the stronger a sink it will be.** Simply by accident a few growers have stumbled upon another key factor in the findings of Savage, Haines & Holbrook most informative paper.

As a result of this, independently six growers began work on development strategies for growing large pumpkins. Our friend Rocco Brewer began to connect a link to enhance cell division of the fruit and peduncle by using natural means, while Brad Wursten in his earlier article here talks about the importance of cell division, temperature and the stages of fruit growth.

Another rather obscure study from 1999 drew the final conclusion for Myself and Matt Debacco. It revolved around a simple application of 100 ppm of a chemical hormone derivative of ethylene called Ethrel (E).

The study found that a single application of (E) within 48 hours of pollination could enhance or extend cell division in the fruit for up to an additional 80%. Normally fruits cells typically divide for only the first ten days or so. After which they can start to expand in size by a mind boggling amount. If the foundation of a big pumpkin is indeed in the number of cells it contains then this is truly a watershed moment in the history of pumpkin science. At last after all the sink source relationship discussions at BP going back more than thirteen years we have found the missing link. I wish my good friend Steve Jepson was around to see this! We have done it STEVE....

So at the Big Show the 1999 study and a few others have revealed an amazing array of potential new treatments or cultivation techniques growers can employ.

Firstly it must be mentioned we do in fact have some true evidence of the effects in applying E to a fruit's peduncle. As it turns out Stew and Ian Paton have in fact tried E during the past summer. They have reported amazing findings in that elongation and expansion of the peduncle was observed after E applications.

Truly these are early days in the research and we are well on the way to confirming what Savage has observed and repeating the 1999 study. Below are a few simple tips growers can implement in the coming months to enhance cell division of the developing fruit buds.

## Growth Hormones Auxin, Gibberellic Acid & Cytokine's

The cytokinins (Cyt) like those found in kelp are a group of chemical plant growth regulators that influence cell division and shoot formation.

- Also Cyt helps to delay senescence of tissues in August.
- Cyt is responsible for moderating auxin transport throughout the plant, and it affects internodal length and leaf size. Lower levels of auxins slow growth in May.
- **Cytokinins overcome apical dominance or the growth of shoots which is a major benefit for enhancing cell division in the fruit and peduncles.**
- Therefore Cytokines are thought to induce cell division and regulation of the fruit's cells just after pollination.

**The more cells a fruit has the more it can expand and thus grow larger.**

### Rocco suggests timing is everything

*Hold off on applications of Kelps which contain cytokinins until just before the pollination bud develops > this goes for the synthetic types as well. Kinetin is commonly used in synthetic rooting product but it can slow meristematic shoot tip growth leading up to pollination time. IF YOU want a bigger plant before pollination then hold off on Kelp.*

*YOU MUST terminate everything a few days before pollination time. The sooner you do this the more auxin will be inhibited in the meristems. The cells of a fruit will develop freely without conflicting signals from the plant's PGR's. Don't worry about the plant's size it's simply irrelevant by pollination time.*

*Finally find a source of E and apply it within 48 hours of pollination to induce cell division for a longer time period. Rocco is positive that 3000 is coming soon!*



# Do AGP PLANTS have a Brain?

## Rocco's Brewer's dirt on roots

**Roots** wriggle through the earth in a worm like manner. As if they had a brain. The tip veers back and forth. Is it actually thinking or what?

Roots have been seen to growing at accelerated speeds. **HOWEVER** when the apical tip or head of the root is removed it is left blind and deprived of its probing force. This results in faster growth that is more linear but is less controlled in its search for nutrients.

The probing nature of the root is a basic life skill!

This process of root growth is called

## ❖ Plant Neurobiology

Referred to as "Root Brain Hypothesi

- It is an old plant science that is new again.
- It was first described before 1900.
- By: Charles Darwin, *The mind of plants*

*"It is hardly an exaggeration to say that the tip of the radicle thus endowed [with sensitivity] and having the power of directing the movements of the adjoining parts, acts like the brain of one of the lower animals; the brain being seated within the anterior (head) end of the body, receiving impressions from the sense-organs, and directing the several movements."* **Charles Darwin**

