

*Growing a giant***Co-op crew leader grows record pumpkin**

BY JOHN HOWLEY

THIS PAST SUMMER was relatively calm when it came to bad weather and power outages, and maybe no one was more thankful for that than Guernsey-Muskingum Electric Cooperative crew leader Bill Neptune.

Instead of worrying about getting the power restored to co-op members, he was able to put in time in his garden — but it was no ordinary garden.



Neptune was busy growing the biggest pumpkin Ohio has ever produced.

“At the peak of growing season in mid-July and the first of August, I was putting between 30 and 40 hours a week in the pumpkin patch — so work a full

day’s worth of work and then come home and work until way after dark on the pumpkins,” he said.

The effort paid off with a 2,008-pound pumpkin that was weighed Oct. 4 at Operation Pumpkin, a relatively new festival in Hamilton.

It’s one of the biggest pumpkins grown in the world this year.

“People ask me all the time, ‘How can you spend that much time in the patch?’” Neptune said. “Well, it is a tremendous amount of work with everything you have to do to grow something like this.”

At the height of the growing season, Neptune said his pumpkin was adding about 50 pounds per day. That’s as fast as he wanted it to grow because when it gets above that growth rate, the pumpkin runs a better risk of splitting, he said.

Even as he prepared to cut the pumpkin from the vine and take it to the competition, it was still adding about eight pounds a day.

Weather always presents a problem when trying to grow these monster-size pumpkins.

“The cold nights make it tough. The pumpkin likes it hot and dry,” he said.

Neptune said it was almost too dry this summer with lower humidity and lower rainfall, but he was able to compensate for that with a drip irrigation system.

“I can deal with the water issue, but I need sunshine and warm weather,” he said. “We had nights that were in the 40s and 50s in August, and that really hurts the growth of the pumpkin. I had to build a structure over the pumpkin to keep it heated at night.

“In Ohio, the way our weather is — it’s really cold at night and warm in the daytime — I ended up heating it at night and cooling it in the daytime. I spent a month trying to keep that the same temperature for the pumpkin so it maintained a good, healthy growth.”

Neptune said it wasn’t uncommon for him to be up in the middle of the night worrying about the pumpkin. And he would spend plenty of time before he went to work and after he got home making sure the climate was right for growing.

“I’d get up every morning and go down and check on her to make sure the temperature was right. I’d have to turn off the heat and turn on the ventilation process and open everything up. I’d really spend a lot of time before I ever left for work. It was the same process in reverse when I came home.”

The previous Ohio record was a 1,725-pound pumpkin grown in 2009 by Christy Harp. At the time, it was a world record. A grower in Switzerland established a new world record this year with a 2,323-pound pumpkin

Finishing the year as one of the country’s top three growers, Neptune received an all-expenses paid trip to New York City, where his pumpkin was displayed at the New York Botanical Garden. ☺

Visit www.countryliving.coop to see Country Living’s complete interview with Bill Neptune.





GROWING THE 2008# OHIO RECORD PUMPKIN

Bill Neptune

FALL PREP

My fall prep starts with the removal of all old plants. I clear down to the bare dirt before I start to add amendments and till. My organic matter is low, so I add what I have, which is chopped corn stalks, 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 per 1000 square feet. I do not do a fall soil test. I rotate my patch every three years.

SPRING PREP

I do a spring soil test before I start. I let my winter rye grow to 12" to 16" and then mow. This makes it easier to till. After mowing, I add the amendments from my soil test. Nitrogen quickly leaches from the soil, so I need to add it in the spring. I spread the correct blend of N-P-K plus micronutrients and till. The entire planting site is tilled twice during the season. Tilling is also done as the plant grows. I have never used mustard.

SEED SELECTION

My seeds are started around April 24th and transplanted outside on May 1st. I use the paper towel method, then into the grow pots in my 85 degree hot box. Once they pop through the starting mix, I use lights and no extra heat. Do not over water.

I am going to grow six plants this year. I put two plants per site and choose the best one when they start to vine. Each plant will have 1000 square feet and is started in a 6' x 10' hoop house.

POLLINATION-VINE PATTERN

The 2008 was pollinated June 24th. I like to pollinate 2-3 pumpkins between 10'-15' out. When choosing, I consider shape, number of lobes and growth rate. I use the Christmas tree pattern with the first two vines angled backwards.

FRUIT COVERING

My pumpkins never see sunshine. I build a plastic tent over each fruit to keep it shaded and dry. A fan is used to keep the stem dry till harvest. My best plant gets a shade cover for hail protection only. It is not used for shade as this would slow the pumpkin's growth.

FERTILIZERS

I add fertilizers during the season. The pumpkin is growing so quickly that it seems to wear the plant down. I feel a healthy plant is the key as it takes less fungicides and has better late season growth. I use Neptune's Harvest and my own compost tea. I also use Growth Products following Ron Wallace's recommendations.

May through early July, I foliar apply Cal Mag Max once a week at 4 ounces per 1000 square feet. Starting mid-July, I apply 5 ounces of TKO phosphite (0-29-26) plus 3 ounces liquid potassium (0-0-25) per 1000 square feet. Every Sunday, I apply 50 gallons of my compost tea plus Neptune's Harvest on 6000 square feet. My mid-season tissue test showed me what the pumpkins were lacking.

IRRIGATION

My watering system is drip tape with hand overhead watering on hot days. I run my drip tape twice a day, applying 50-70 gallons of water per plant per day. We had a wet year so I watered accordingly. My water comes from a spring with a 1500 gallon holding tank.

WEED CONTROL

For the past five years, I have used one year old landscaping cloth in my watermelon patch. Last year, I tried it with the pumpkins. I put one 3' strip of landscaping cloth along each side of the main vine. Small slits were cut under the leaf stems to allow rooting. Melon roots grow through the cloth but pumpkin roots are too large. I use a small amount of soil to encourage root growth. The rest of the vines are not buried. The remainder of the patch is weeded by hand.

2014 IMPROVEMENTS

I used less fungicides and insecticides and kept my plants healthier. I applied compost tea every week along with Growth Products (TKO). I did a tissue test mid-season. Best of luck in 2015!



(Top) Jo and Bob Liggett with the 1964# Circleville Pumpkin Show Champion
(Bottom) Weston 1714# and 1718#ers



GROWING THE 1714# and 1718# PUMPKINS CECIL and TERESA WESTON

This year is our 5th year growing Giant Pumpkins, and by far our best year. Our PB prior to this year was 1312 lbs. (1381 Checkon x 1725 Harp) 22.7% heavy which place first at the Circleville Pumpkin Show in 2013. We grew that seed this year along with the 1676.5 Daletas, and the 1623 Wallace. The 1623 Wallace aborted at the end of Aug, but the 1676.5 Daletas went on to grow our new PB of 1718 lbs. taking second place at Oakland Nursery in Dublin OH to Jerry Rose's 1765.5 lb. winning pumpkin. The 1312 Weston broke the Pumpkin Show record of 1636 set in 2009 weighing in at 1714 lbs., only to fall a few minutes later and end up in 2nd place to Doctor Liggett's 1964 lb. 2032 Mathison.

We would like to thank the OVGPG and their members for the information that they have provided to us at the annual spring seminar, summer patch tours and the newsletters, as well as Parks Garden Center for providing us with an avenue to purchase bulk supplies in the spring every year. They are a large part of our successful year.

Team Weston 2014 recap



This year we started off with the following plan.

1. Grow a bigger plant.
2. Pollinate on a bigger plant.
3. Pollinate before the summer solstice (Jun 21)
4. Extend the length of time that the organics are available to the plant.
5. Get the nutrient balance as perfect as we could in the plant before fruit set.
6. Prevent heat stress in the plant.

The reasons for items 1 and 2 were to get the plant big enough before fruit set to have more nutrients available to the fruit instead of using energy to grow the plant after fruit set. We felt that we had maxed out our potential fruit growth in the 750 sq ft. In order to get a bigger fruit we needed more leaves. Many top growers worldwide (including Doc) were getting bigger fruit on much bigger plants. In order to accomplish this we needed to start earlier, create warm environment, and have more Nitrogen available. We used Calcuim Nitrate at more than just the plant site, and we used Azos in our bury mix at every leaf node to help bring in Nitrogen.

The reason for number 3 was the thought those longer days (more light) equals more photosynthesis. More photosynthesis equals more growth.

The idea behind items 4 and 5 follows a combination of a theory that Matt DeBacco spoke about in 2013 at Niagara seminar and the presentation by Russ Landry in 2013 at the GPC seminar. Matt states that the cell division stops around day 20 based on his observation of Mosaic virus infected plants (and cites scientific studies of other fruits and vegetables that support the theory that cell division stops and the remaining growth is just cell elongation). I think this may be as long as 30 days. Russ Landry presented that the xylem function decreases and becomes ineffective at the fruits half-life (around day 40) stopping the ability to get Calcium into the fruit. With those two things in mind we decided that we needed to get perfect balance into the plant prior to females even beginning and keeping it as constant. We started UreaMate in the drencher when the plant was 6 ft long (well before the first female was produced). Since UreaMate is immediately available and a "perfect" balance for cucurbits, we feel that this is a major factor in the incredible early fruit growth that we had this year. Since the amendments we normally use typically only last for about 3 months, we wanted to change the way we put them down so they would be available to the plant over a longer period. We did this by dividing the patch into 6ft x 6ft squares and took the amendments that the soil calculator showed was necessary and divided it by 100 (the number of squares in 60x60 patch). Then we put the nutrients down in each 6ftx6ft square and tilled in 2 weeks ahead of plant growth instead of adding everything all at once in Feb like we normally do.

Number 6 was in response to the terrible heat damage that we have experienced during the last 2 years. When we have fast growing plants, they sunburn easily. We felt that if we could keep the plant from stressing and keep transpiration going during the high heat days where they normally shut down and go into water conservation mode, that we could have healthier plants and better growth.

We feel that we accomplished all of the goals and that they contributed largely to our best season so far. But we also feel that the weather was the best pumpkin growing weather that we have ever had. Less days in the 90s, none in the 100s, and we were very fortunate in the storm department. Almost every severe storm that came through Circleville, missed our patch, sometimes by only a mile. Not having the heavy rains, hail, or high winds definitely contributed to a successful season.

Bury mix

Don't mix this and save it, mix only as much as you are going to use in a day, two tops. Store any leftovers in cool dry place (few refrigerate). During peak growth we used the following mixture, but when less growth just use a smaller measuring device.

1. 1 cup Epsoma Starter Plus
2. 1 cup Mychorrhizae
3. 1 cup kelp meal
4. 1 cup alfalfa meal
5. 2 cups worm casting
6. ½ cup humic acid
7. 2 Tbls Serenade Max
8. 2 Tbls Azos

Spray Program

Since things were in overdrive, the only foliar we used was Cal Carb, an insecticide once a week and Kelp and a fungicide twice a week until Aug, when we added Cal Mag Max and MicroTech CT

Rotating Fungicides that were sprayed were

Neem Oil (also an insecticide and miticide) (once a month) – Organic
Actinovate (every 3 weeks) – Organic
Milk(40%) Once in May, Jun, and early Jul
Daconil (every other week)
TKO (every other week)
Eagle (once a month)
Manzate (once a month)
Quintech (3 weeks in a row starting Jul 15th)
Quilt (once a month)

Drench Program

We started out the year drenching Essentials Plus every week, until the plant was vining and growing well, then we added ½ Tsp per plant every day UreaMate – this was slowly ramped up over a period of a month to 1 TBLS a day per plant. In the past people have blown fruit using as little as 2 TBLS per week, by slowly increasing it and applying it every day we were able to keep this from happening. During the peak 66 lbs a day, the injector only ran half of the water cycle on that plant, so it only got half of the solution for that week.

In July we ran out of Essentials Plus and switched to Soluble Kelp (1 cup per plant) with a pinch of soluble humic and ½ cup soluble Fish (per plant) – once a week, in Aug we added 1 qt of CalMag Max to the drenches.

Fungicide Subdue granular went down with amendments ahead of plant growth

Then once every 2 weeks starting first week of July we drenched with

- Serenade Max & Actinovate
- Quadris & Agrifos
- Serenade Max & Actinovate
- Subdue Max
- Terroazole
- Clearys 3336
- Agrifos

OAKLAND NURSERY CHAMPION

1765.5# ROSE

(L-R) Quinn Werner- Teresa and Cecil Weston- Jerry and Jerry III Rose- Mark Clementz- Jo and Bob Liggett



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WOW! GIANT TOMATO WORLD RECORD SMASHED! 8.41 LB WATER GROWN BY MACCOY FROM ELY, MN.

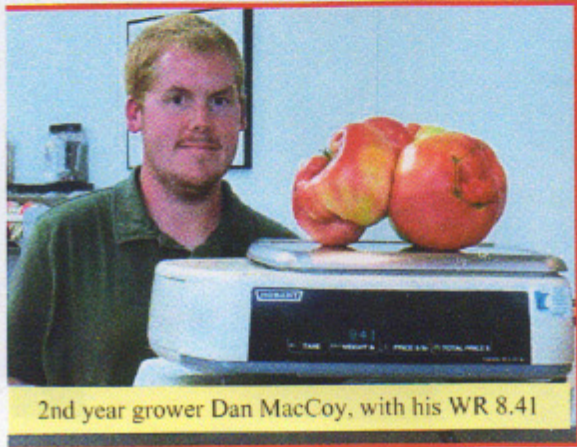


It was a busy day for sure. I knew I had a very big tomato on the vine, so I called Don Young and Bill Foss to witness the weigh off, on a certified scale. The 8.41 MacCoy was 47 days old when I picked it on Friday August, 22 and had a circumference of 30.25 inches. The seed I used was the 4.57 MacCoy that I derived last year from the 5.07 Boudyo. I grew it on a 30 inch tall plant that was heavily pruned from the beginning to have a single stem. The blossom was set on the first fruit truss. Once the blossom set a maximum of ten days after, I started trimming all growth. This is how I maintained all ten of my greenhouse plants. Right when the seedling popped up I drenched with advance nutrients voodoo juice/water mix and once a week thereafter. I also used Extreme Gardening Mykos in the planting hole. Watered it



with compost tea a couple times through the plants life. Also, all of my watering was done with rainwater from the rain barrel. Drenched in Duncels/water one time vs. the foliar feed. I also have WOW* Wallace tea bags planted with many of my plants in the 300 square foot greenhouse,

which I only used half of this year. None specifically with this plant, but they are close. The temperatures ranged from 90 degrees during the day (a few times) to 39 degrees at night. This was easier to control with the greenhouse to attempt to keep at a temperature around 80 degrees. Also, I like to harvest my tomato's when they stop growing instead of at first blush. I measure every couple days to see just when that is. In the last 2 days it gained 3/8 inch.



2nd year grower Dan MacCoy, with his WR 8.41



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THE YEAR OF THE 1964
BOB LIGGETT

Since my 2013 year seemed to be hampered by soil borne diseases in the general area where I had grown pumpkins for years, I began to think about soil sterilization. Meanwhile, the farmer next door encouraged me to grow on his adjoining property, just north of my property. So I took him up on his offer, took a soil test and added amendments as recommended by the Langley Soil Calculator. Also, I added a year old pickup load of pig manure, three yards of alpaca manure and 3 inches of mulched maple leaves. I didn't get these tilled under in the fall and found it much harder to till in the spring.

At the February GPC meeting in Orlando, Tim Mathison gave me seeds from his 2032 World record and Joel Holland encouraged me to grow his 1791. Our club competition seed was the Weston 1312. After some thought, I decided to plant these 3 seeds. I started the seeds indoors on April 23rd. The three 10-day-old plants were transplanted to the patch on May 3rd. The pollinator of the 1791 and 1312 was the Mathison. The 2032 was pollinated by the 1791.

A week before planting, a 21 foot heating cable was installed at a shovel blade depth in a 4 x 4 foot square at each planting site. In addition, 3 pounds of fish meal and 2 cups of calcium nitrate were applied in a 10 foot circle around each site.

My amendments at the planting site were a mixture of ½ potting soil and ½ dirt and ½ cup mycorrhizae (touching roots). I watered these in with ½ gallon 10-52-10 and ½ gallon root shield.

My hut was formed by three 10 foot x ½ inch pvc pipe over which I put remay cloth to hold heat. I added clear plastic and 150 watt outdoor flood light bulbs to use when the temperature got too cold.

I once read or heard a logical theory that the plant feeds the growth of a new leaf until a certain point at which the leaf matures enough to start participating in the normal process of photosynthesis and that is when the leave becomes most susceptible to damage. My experience shows that, due to the intense rays on sunny days, the fourth leaf back from the tip sunburns. So, as the plant grew, I tried to shade these leaves along with the growing tip of the main vine and the tips of the fastest growing side vines. I used 50% silver aluma cloth over 10 foot ½ inch pvc pipe formed into hoops.

Like other pumpkin growers, I have had experience with watermelon mosaic virus. In trying to control the disease carrying aphids, I started using the silver aluma cloth on the outside of the wooden snow fence which surrounds my 90x33 foot patch. Ohio State research has shown that silver repels aphids. So, when trying to break the annual cycle of WM virus, I also used silver ground cover for several years. Our local DuPont plant used to make silver metalized mylar and employees could obtain the mill end rolls for home use. Some of it wound up in my patch. Starting two weeks before the winter wheat was harvested I started a weekly spraying of Bio Repel (garlic) which repels soft bodied insects.

We had relentless westerly winds from a half mile open field which would affect the leaves in our patch. To combat the wind, I used Paul Huffer's method of attaching rebar to the top of metal T posts to increase their height to 7 feet. I then added the orange plastic snow fence above the 4 foot wooden snow fence. On the outside, I attached 7 foot tall 50% aluma cloth which did a great job in eliminating

\$50.00 per seed
1964 Liggett +8% heavy
F - 2032 Mathison 2014
M - 1791 Holland



wind damage to the leaves. The rest of the patch was surrounded by wooden snow fence with 3 1/2 foot tall aluma cloth on the outside. The patch was also protected from corn planted on north and east sides.

I used well water in drip irrigation. The 4 in. emitter tape was supplied by a 1 1/2 in. header line. A commercial water meter told exactly how much water was going to the patch. My goal of an inch of water a week translated to 80 gallons of water per plant per day. My soil is sandy loam. I added 1 tablespoon of urea mate every other day through the inline E-Z Gro injector system. This equaled a rate of 1 heaping tablespoon per plant per week. Urea mate 5-10-27 is a balanced water soluble fertilizer made by Stollers and used by many vegetable growers in northern Ohio. My system was on a timer and turned on at 10 a.m. and off about 10:30 a.m. while I was at the office.

Once the main vine grew to 10 feet we tried to pollinate the next three females on the vine. After about a week, we decided on which one was the best. Next, we put a 4x5 foot piece of 1 inch open cell styrofoam under the pumpkin. Between the pumpkin and the styrofoam were two layers of mill felt. Next we built a hut from 3/4 inch x 15 ft. pvc pipe covered with a silver colored tarp. The tarp reduced the surface temperature fluctuations and kept the stem dry.

I used a restaurant size ketchup bottle with a large hole in the nozzle to puff a mixture of mycorrhizae, root shield, humic acid, kelp, alpha meal and azos at each leaf node. I then covered each node with enough dirt to permit the top root to curl around and anchor into the soil. Tertiary buds and tendrils were snipped off with scissors. Ten percent hydrogen peroxide was often used when the side vines were ended at about 13 feet. The four side vines (two on each side) before the pumpkin were not ended but were turned parallel to the main vine and continued to grow to the edge of the patch. We continued to remove tertiary vines and wild hairs until the end of the season.

Starting on August 1st, I began using 1000 watt Hortilux grow lights. They came on at 3:30 a.m. and off at 7:30 a.m. The light was directed at the newest growth.

During our two vacations, totaling 20 days, our loyal friends and fellow growers Teresa and Cecil Weston took care of our patch including using the Stihl Mist Blower on a regular basis.

At the end of August, Country Boy and Buckeye Blondie's pumpkins were ahead of ours with their OT measurements. Perhaps, the weeds which we sheared off at the level of the height of the large old leaves held them up so they could continue to nourish the fruit. In the past, large old leaves drooped and caused stress at the junction with the main vine. The resulting deterioration did not occur this year. September growth continued and by the end of month the OT on my pumpkin was larger than theirs.

The Ohio Valley Spray program was the basis for our plant health. The old AGRO-K philosophy of daily foliar feeding guided my evening spraying of seaweed, fish, vigor-cal, vigor-cal phos, and Cal-Boron.

Thus, new soil properly prepared, great seeds, appropriate amendments, a cool summer, the utilization of weeds, and a lot of hard work culminated in our best giant pumpkin ever.

\$35.⁰⁰ per seed
1621 Liggett +9% heavy
F - 1312 Weston 2014
M - 2032 Mathison



**BENI MEIER
WORLD RECORD HOLDER (2323.7#)**

Alan Gibson

*original interviews and pictures supplied by Steve Connolly (SNGPG)

Beni Meier set the world record for giant pumpkins in 2014 three times. He is a thirty-one year old commercial greenhouse grower and wholesale nurseryman.

Beni, his wife and three children reside in Pfungen, Switzerland. He has been growing giant pumpkins for ten years.

Here is his record the past three years:

Weight	Seed (female)	% heavy
(2014)		
2323.7#- World Record	2009 Wallace	+14%
2102#	1985 Miller	+5%
2096.6#	2328 Meier (dmg)	+10%
(2013)		
2328# (dmg)	2009 Wallace	+8%
(2012)		
1694#- European Record	934 Schieder	+7%



PATCH SIZE- LAYOUT

Beni grows in a climate controlled plastic covered greenhouse. Northern Switzerland has a short growing season so greenhouses are necessary to compete on a world class level.

He grows three plants in the 26' x 95' greenhouse (2400 square feet or 800 square feet per plant).

When cooling in the summer is necessary, the plastic sides can be rolled up. Large fans on the ends facilitate ventilation. Overhead irrigation is used on hot days.

SOIL- SOIL PREPARATION

The soil in the greenhouse is 50" deep. Beni makes his own compost from leftover potted plants. This is mixed with peat moss, perlite, vermiculite and wood/ coconut shell shavings (Cocopur is the brand name). The pH is 7.1. This soil mix stays aerated and loose giving the roots lots of oxygen and room to grow. Perlite gives good water drainage. No manure is used.

The only spring ammendments (late April) were Rootshield (Trichoderma harzanium) and mycorrhizae (Glomus Intraradicans). The liquid mycorrhizae is applied monthly through the overhead sprinklers.

FERTILITY

Beni does no soil or tissue tests. He uses his own measuring tools to check the conductivity of the soil on a weekly basis. Fertilizer is increased if the conductivity is low.

The following water soluble fertilizers are added to the irrigation water: 15-5-15 (Grower), 13-5-20 (Finisher) and Vegasan Mega. These are also applied with foliar sprays.

SOIL AND FOLIAR DISEASES



No soil chemicals appear to be used except Rootshield. The 1985 Miller plant did have some vine and stump rotting issues this year. In 2013, Beni lost two plants.

Powdery mildew is a problem in greenhouses. He made four fungicide applications last year rotating Funginex (Triforine) and Armicarb (Potassium Bicarbonate).

INSECT CONTROL

There are no squash bugs, squash vine borers or cucumber beetles. Beni's main problems are aphids, spider mites and white flies. The products used were:

Vertimec (Abamectin)- mite control Actara (Thiamethoxam)- neonicotinoid similar to Safari
Pyrethrum FS- similar to Talstar

IRRIGATION

Beni uses both overhead and drip irrigation. He uses a Dosatron to meter fertilizers and pesticides. Rain water is collected from the greenhouse roof and stored. Watering is done for 15 minutes- twice per day.

PRUNING

Beni uses the Christmas tree pattern with the spider vine pattern at the end. Side vines are 14' long. Vines are buried with soil at each leaf node to promote extra rooting. After three weeks, they are uncovered with a water hose.

SEED STARTING

Seed starting consists of potting soil, mycorrhizae and 90 degree temperatures.

Seeds are started in mid-April and transplanted in early May. He plants nine seedlings in the greenhouse and culls to his three plants about June 1st.

WEED CONTROL

Roundup was used in May. Weeds and cultivating are done by hand.

POLLINATION

All three pumpkins were pollinated about June 19th at 12.5 feet on the main vine.

VARMITS

Hundreds of moles and mice are trapped.

CARBON DIOXIDE (CO₂)

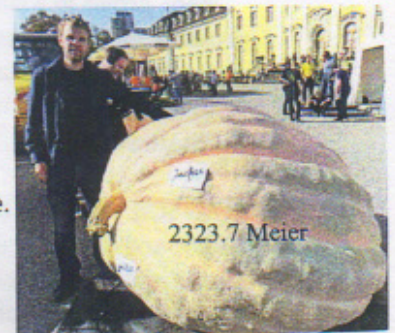
Normal air has 400 ppm of CO₂ concentration. Optimal photosynthesis occurs at 1000 ppm.

Beni uses Lithovit (similar to CalCarb from RTI). This is a microscopically ground limestone that transfers into the leaves through the stomates.

Beni feels the Lithovit works better inside a greenhouse as the gas cannot escape. Lithovit was used five times last year at 21 day intervals.

We would like to congratulate Beni Meier on producing three world record pumpkins. He set and reset the world record three weeks in a row.

He is the Great Pumpkin Commonwealth's "Grower of the Year" with a three pumpkin total of 6522.3#. Well done!





MATT BRUNGARD- 2014 OVGPG CHAMPION (1951#)
Alan Gibson- Ohio Valley Giant Pumpkin Growers

Matt Brungard is relatively new to the giant pumpkin growing community. In the past three years, he has increased his pumpkin weights until he now owns the #3 pumpkin all-time in Ohio (1951#).

Here are his results:

2014	1951#- 1753#- 917#
2013	1333#
2012	1015.5#

Matt, his wife Amy and children (David, John, Jameka, Justin and Anthony) live on the family farm near New Middletown, Ohio.

Matt is the 5th generation to farm the 150 acres. Half is devoted to produce (sweet corn, peaches, blueberries, etc.) and half to grain crops. The Brungard families came to eastern Ohio from York, Pennsylvania by covered wagon in 1833.

Matt attended Anderson College in Indiana and trained as a naturopathic physician. This science deals with human nutrition, diet, cleansing and lifestyle. This was Matt's profession until he "retired" to farm with his parents. He still practices three days a month.

Matt was a competitive cyclist for ten years. He now leads the praise team at the New Springfield Church of God. Amy is a school teacher in Austintown.

Matt was on the OVGPG patch tour last year. Jerry Snyder has mentored him these past three years.

PLANT SAP TESTING

Both Jerry and Matt do plant sap testing rather than tissue testing. They deal with John Kempf from Advancing Echo Ag. Advancing Echo Ag is affiliated with Nova Crop Control from the Netherlands. Matt still uses Western Labs for soil tests.

A plant sap test checks for: sugar level (brix), pH, conductivity, and 17 different nutrients. Matt believes that " foliar spraying is key to get the nutrients into the plant". He mixed Neptune's liquid kelp, calcium acetate, Photomag, Hyper CalP and Sea Shield together and sprayed the plants three times per week.

PLANT SIZE (Layout)

Three plants are grown on 2400 square feet. The 1951 plant took over 1000 square feet. This is a 3rd year patch. Matt tries to rotate 1/3 of the patch each year.

The Christmas tree style of pruning (with spider vines at the end) was used. Side vines are 15 feet long. The main vine grew 60 feet long. Wind protection is provided by plastic snow fence. Two large maple trees are nearby with some intruding roots. Deep subsoiling helped to cut the roots. The patch was only tilled twice in 2014.

SOIL PREPARATION (Cover Crops)- FERTILITY

This is a sandy loam topsoil. The pH was 7.6 in the fall but came down to 6.9 by spring.

The fall ammendments included: a large load of sheep manure, rye straw and 80# gypsum. This was tilled under in the spring and a cover crop of oats and buckwheat was planted.

The spring ammendments (June) were: 100# kelp, 100# humic acid and 10# mycorrhizae. In early June, the plants were lacking nitrogen due to the rye straw and cool temperatures. A small amount of urea and 20-20-20 water soluble fertilizer was added to correct the problem.



SOIL DISEASES

25# of granular Subdue was applied and tilled in during early June. AgriFos was used as a spray and drench during the season. Companion was also used.

FOLIAR DISEASES

Some of the products used were: Daconil, Manzate, AgriFos and Sea Shield. 3-18-18 liquid fertilizer from Growth Products was added to the sprays.

INSECT CONTROL

Bayer Tree and Shrub was used as a soil drench for insects. Warrior T (similar to Talstar) and Asana were used in the spray program. Aphids were a problem so more Bayer Tree and Shrub (Merit) will be used later in the season.

IRRIGATION

Drip irrigation on 18" centers was used. The weather was very good so not much was needed. The well water pH is 8.6

SEED STARTING

Seeds were started on April 18th (window with heater below). Plants tend to get leggy so he might look for a Gro-Lite this year.

The seedlings were transplanted to one gallon pots. These were planted in the patch on May 4th. Plastic huts with lights are used. Styrofoam coolers at night provide 20 degrees of extra protection.

WEED CONTROL

No Roundup was used. Cultivation and weeding were done by hand.

POLLINATION

The 1951 Brungard was pollinated on June 29th. It was a 4 lobed female (12' out) on the 1744.5 Fulk plant. The male pollinator was the 1333 Brungard that produced his 1753#er. Final estimated weight was 1865# (4.6% heavy).

PROTECTION

Sheets and blankets were used as needed. Two pumpkins were grown on ground covers. The other was grown on sand.

In September, a reemay tent was constructed over the whole 1951 plant. Stakes (with a tennis ball on top) were used to keep the reemay off the plant. Ripping of the light weight reemay was a problem. The 1951 was still growing at harvest.

2015 PLANS

Matt plans to grow the 1951 Brungard, 1744.5 Fulk and 2008 Neptune in 2015. One plant will be on new ground.

He plans to attend the GPC seminar in Wilkes-Barre, Pennsylvania where he will accept his GPC jacket (1900# club).

Unfortunately, all but a few of the 1951 seeds were lost in the mail.

Congratulations to Matt, Amy and family on their recent success. We are glad to have them as members of the Ohio Valley Giant Pumpkin Growers. For more OVGPG interviews, go to our website at ovgpg.com "articles".

Biopesticides for Managing Plant Diseases Organically

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Biopesticides are defined by EPA as pesticides derived from natural materials. There are three types. Biochemical pesticides contain naturally occurring substances that control pests. Substances that control diseases include potassium bicarbonate, hydrogen dioxide, phosphorous acids, plant extracts, and botanical oils. Microbial pesticides contain microorganisms that function as biocontrol agents, affecting the pathogen directly or indirectly through the compounds they produce. Plant-incorporated protectants or PIPs are the least common type of biopesticide. These are pesticidal substances produced by plants that contain genetic material added to the plant often through genetic engineering. The genetic material and the protein it encodes, but not the plant itself, are regulated by EPA. Examples are virus-resistant varieties producing the virus coat protein, which covers virus particles after infection preventing their replication. More information about biopesticides plus lists of active ingredients and products are on the web at <http://www.epa.gov/opppbd1/biopesticides/index.htm>. There are also biopesticides for managing weeds and insect pests.

Biopesticides have advantages. Their activity generally is targeted to pests and closely related organisms, and they are usually inherently less toxic than conventional pesticides, thus they do not have the same potential to affect birds, beneficial insects, and mammals (there are exceptions, so check the label when this is a major reason for choosing biopesticides). And thus they typically have short REI and PHI. They generally decompose fast and sometimes are effective in small quantities, thus exposure is lower and potential pollution problems are avoided. Recognizing that biopesticides tend to pose fewer risks than conventional pesticides, EPA has been encouraging their development and use. EPA generally requires less data to register a biopesticide than a conventional pesticide, but enough data about the composition, toxicity, degradation, and other characteristics of the pesticide to ensure that the product will not have adverse effects on human health or the environment. EPA can conduct the registration process more quickly with biopesticides, often taking less than a year, compared with an average of more than 3 years for conventional pesticides. To facilitate their registration, the Biopesticides and Pollution Prevention Division was established in the Office of Pesticide Programs in 1994. Some biopesticides are defined as minimum risk pesticides through FIFRA Section 25(b) rule because their active and inert ingredients are generally recognized as safe (GRAS). These consequently are exempted from the regulation requirements of FIFRA and thus can be used on any labeled crops for any target since they do not need to be registered as a pesticide. 'Exempt from EPA registration' is stated on the label of these products.

Limited data on efficacy of biopesticides can be considered their main disadvantage. Data documenting efficacy is not considered when making decisions about registration of pesticides in the USA. Many biopesticides are produced by small companies lacking the R & D funds to support field trials to obtain efficacy data by experienced university and other independent researchers. To help fill this gap, the IR-4 Biopesticide and Organic Support Program funds grants to obtain efficacy information for biopesticides in development as well as those already registered. These funded projects help the program meet its objective, which is to further the development and registration of biopesticides for use in pest management systems for specialty crops (which include all vegetables) or for minor uses on major crops. Information about this program, plus databases of labels and projects are at: <http://ir4.rutgers.edu/biopesticides.html>.

Most biopesticides are approved for organic production and most products approved for organic production are biopesticides, thus they have a logical excellent fit for managing diseases in organic crops. However some formulations are not approved, which can be due to inerts. For example, the potassium bicarbonate products EcoMate Armicarb O, Kaligreen and MilStop are approved whereas Armicarb is not. Also, some biopesticidal substances are not allowed under NOP (National Organic Program), for example phosphorous acids and genetically-engineered

PIPs. Additionally, there are important organic fungicides that are not biopesticides, including mineral oils, copper, and sulfur. Biopesticides break down in the environment, thus there is no concern about build-up in soil as with copper, which is an element. However, biopesticides generally do not have the breadth of activity, efficacy, or residual activity of copper; thus it is important to obtain information about these factors and to know the target disease(s) when selecting biopesticides. The earlier in disease development that applications are started, the more effective the product will be. This is not unique to biopesticides. Fungicides cannot eradicate established lesions.

Some biopesticides, notably Regalia and Serenade, have induced plant resistance as a mode of action. These need to be applied before infection for this activity to be effective.

Several biopesticides have proven effective for diseases affecting vegetable crops. Powdery mildew is perhaps the easiest foliar disease to manage with biopesticides. It can be controlled with several different biopesticides, including botanical oil (Organocide, Mildew Cure, etc), potassium bicarbonate (Kaligreen, MilStop), and microbials (Actinovate, Serenade, Sonata, etc).

Following is a list of some biopesticides labeled for disease control in vegetable crops. The active ingredient follows product name. For products labeled for managing multiple diseases on many crops, labeled diseases of cucurbit crops are included to provide some information about the breadth of activity. Products listed with OMRI (Organic Materials Review Institute) are NOP compliant. Check state registration: each product may not be registered in all states. Also, always check with your certifier before purchasing any product. 'No Ag Label' indicates an agricultural label was not found for the product.

Actinovate AG. 0.0371% *Streptomyces lydicus* strain WYEC 108. Labeled for suppressing several foliar and soil-borne diseases on many crops; diseases and crops listed separately. The biocontrol agent colonizes roots, protecting them from pathogens and making minerals and micronutrients more available to plants, which thus are more vigorous and larger. For best results with applications to foliage, label indicates to use a non-ionic spreader-sticker. OMRI-listed. EPA Reg. No. 73314-1. Monsanto BioAg (formerly Natural Industries, Inc.).

BacStop. 2.0% thyme, 2.0% clove & clove oil, 1.5% cinnamon, 1.0% peppermint & peppermint oil, and 1.0% garlic oil. Broadly labeled primarily for bacterial diseases including bacterial leaf spot, bacterial wilt, bacterial fruit blotch, downy mildew, and powdery mildew in cucurbits. Recommended used with EF400 for these and some other diseases. Exempt from EPA registration. USAgritech, Inc.

Bio-Tam. 2% *Trichoderma asperellum* strain ICC 012 and 2% *Trichoderma gamsii* strain ICC 080. These beneficial fungi have different modes of action and are active over different temperature ranges (starting at 45°F) and environmental conditions. They are effective for diseases caused by *Phytophthora capsici*, *Rhizoctonia*, *Pythium* and *Verticillium*. General label. OMRI-listed. EPA Reg. No. 80289-9-69592. Isagro USA; distributed by Bayer CropScience (formerly AgraQuest).

Cease. 1.34% *Bacillus subtilis* strain QST 713. Broadly labeled for use on greenhouse vegetables. Labeled for angular leaf spot, anthracnose, bacterial fruit blotch, downy mildew, gummy stem blight, and powdery mildew in cucurbits. OMRI-listed. EPA Reg. No. 69592-19-68539. BioWorks, Inc.

Companion. 0.03% *Bacillus subtilis* strain GB03. Broadly labeled for foliar and soil-borne diseases, including bacterial wilt, gummy stem blight, powdery mildew, damping-off, crown and root rot, *Phytophthora* blight, and *Fusarium* wilt in cucurbits. EPA Reg. No. 71065-3. Growth Products, Ltd.

Contans WG. 5.3% *Coniothyrium minitans* strain CON/M/91-08. Soil-applied product for *Sclerotinia sclerotiorum* (white mold pathogen). OMRI-listed. EPA Reg. No. 72444-1. SipcamaAdvan.

Double Nickel 55 LC and WDG. *Bacillus amyloliquefaciens* strain D747, 98.8% and 25%, respectively. Broadly labeled for foliar and soil-borne diseases, including downy mildew, gummy stem blight, powdery mildew, damping-off, crown and root rot, *Monosporascus* vine

decline, and charcoal rot in cucurbits. OMRI-listed. EPA Reg No. 70051-107 and 108, respectively. Certis USA, LLC.

EF400. 8.2% clove, 8.1% rosemary, and 6.7% peppermint. Broadly labeled including downy mildew and powdery mildew in cucurbits. Exempt from EPA registration. No Ag Label. USAgriTech, Inc.

Kaligreen. 82% potassium bicarbonate. Labeled for powdery mildew. OMRI-listed. EPA Reg. No. 11581-2. Arysta LifeScience North America LLC.

KeyPlex 350 OR. 0.063% yeast extract hydrolysate from *Saccharomyces cerevisiae*. Combination of defensive proteins (alpha-keto acids) and secondary and micronutrients. Elicits systemic acquired resistance in plants against fungal and bacterial pathogens. Labeled for general disease control in vegetables with specific mention of bacterial leaf spot in tomato. EPA approval for organic production. EPA Reg. No. 73512-4. KeyPlex.

MeloCon WG. 6% *Paecilomyces lilacinus* strain PL251. This soil fungus parasitizes many types of plant parasitic nematodes, including root knot and root lesion, without adverse impact on beneficial nematodes. OMRI-listed. EPA Reg No. 72444-2. Certis USA, LLC.

Mildew Cure (formerly GC-3 Organic fungicide). 30% cottonseed oil, 30% corn oil, 23% garlic extract. Labeled for powdery mildew. OMRI-listed. Exempt from EPA registration. JH Biotech, Inc.

MilStop. 85% potassium bicarbonate. Broadly labeled including Alternaria leaf spot, anthracnose, downy mildew, powdery mildew, scab, and Septoria leaf spot in cucurbits. OMRI-listed. EPA Reg. No. 70870-I-68539. BioWorks, Inc.

M-Pede. 49% Potassium salts of fatty acids. Labeled for powdery mildew and several insects and mites. OMRI-listed. EPA Reg. No. 10163-324. Gowan Co.

Mycostop. 30% *Streptomyces griseoviridis* strain K61. Mycostop can be incorporated in potting mix, applied as a seed treatment, used as a transplant dip, and applied to soil as a spray, drench, or through drip irrigation. It is labeled for control of seed rot, root and stem rot, and wilt caused by *Fusarium*, *Alternaria*, and *Phomopsis* of container-grown vegetables and damping-off and early root rot of vegetables in the field. OMRI listed. EPA Reg No. 64137-5. Verdera Oy.

Organocide. 5% sesame oil. Labeled broadly for several fungal diseases and insects. OMRI-listed. Exempt from EPA registration. No Ag Label. Organic Laboratories, Inc.

OxiDate. 27% hydrogen dioxide. Broadly labeled including Alternaria, anthracnose, downy mildew, gummy stem blight, leaf spot, Phytophthora, powdery mildew, and root rots in cucurbits. OMRI-listed. EPA Reg. No. 70299-2. BioSafe Systems, LLC.

Prestop. 32% *Gliocladium catenulatum* strain J1446. Broadly labeled primarily for application to soil for several seed and soil pathogens, and also to foliage for select crops and before fruiting. OMRI-listed. EPA Reg. No. 64137-11. Verdera Oy.

Procidic. 3.5% Citric acid. Labeled for damping-off, foliar diseases caused by fungal and bacterial pathogens, and post-harvest diseases. Previously marketed as Citrex. NOP compliant; registered for use in organic agriculture with Washington State Dept of Ag. Exempt from EPA registration. No Ag Label. Greenspire Global, Inc.

Promax. 3.5% Thyme oil. OMRI-listed. Exempt from EPA registration. No Ag Label. Bio Huma Netics, Inc.

Regalia. 5% Extract of *Reynoutria sachalinensis*. Boosts the plant's natural defense mechanisms against certain fungal and bacterial diseases. Broadly labeled including Alternaria blight, anthracnose, Cercospora leaf spot, downy mildew, gummy stem blight, Phytophthora blight, and powdery mildew in cucurbits. OMRI-listed. EPA Reg. No. 84059-2. Marrone Bio Innovations, Inc.

RootShield WP and Granules (formerly T-22 HC and PlantShield HC). 1.15% *Trichoderma harzianum* Rifai strain KRL-AG2. Protects plant roots against the fungal pathogens *Rhizoctonia*, *Pythium*, and *Fusarium*. The biocontrol fungus accomplishes this by growing on roots and releasing enzymes that dissolve the cell wall of many fungal pathogens, which it consumes.

OMRI-listed. EPA Reg. No. 68539-3 and -7 for Granules and WP formulations, respectively. BioWorks, Inc.

RootShield Plus WP. 1.15% *Trichoderma harzianum* Rifai strain T-22 and 0.61% *Trichoderma virens* strain G-41. See previous product. OMRI-listed. EPA Reg. No. 68539-9. BioWorks, Inc.

Serenade Opti. 26.2% *Bacillus subtilis* strain QST 713. New formulation. Broadly labeled including downy mildew, gummy stem blight, and powdery mildew in cucurbits. OMRI-listed. EPA Reg. No. 264-1160. Previous product names and formulations: Serenade, Serenade Max, Serenade Optimum. Bayer CropScience (formerly AgraQuest).

Serenade ASO. 1.34% *Bacillus subtilis* strain QST 713. This product will replace Serenade Soil. EPA Reg. No. 264-1152. Bayer CropScience (formerly AgraQuest).

Serenade Soil. 1.34% *Bacillus subtilis* strain QST 713. This bacterium colonizes roots and produces compounds that affect pathogens directly and trigger metabolic pathways to activate the plant's natural defenses and modulate growth. Labeled for diseases caused by *Rhizoctonia*, *Pythium*, *Fusarium*, *Verticillium* and *Phytophthora*. OMRI-listed. EPA Reg. No. 264-1152. Bayer CropScience (formerly AgraQuest).

SoilGard 12G. 12% *Gliocladium virens* strain GL-21. Generally labeled for damping-off and root rot pathogens in field and greenhouse production. OMRI-listed. EPA Reg. No. 70051-3. Certis USA, LLC.

Sonata. 1.38% *Bacillus pumilus* strain QST 2808. Labeled for downy mildew and powdery mildew. OMRI-listed. EPA Reg. No. 264-1153. Bayer CropScience (formerly AgraQuest).

Taegro ECO. 13% *Bacillus subtilis* var. *amyloliquefaciens* strain FZB24. Labeled for diseases caused by the soil-borne pathogens *Rhizoctonia* and *Fusarium* in many crops. OMRI-listed. EPA Reg. No. 70127-5. Syngenta Crop Protection (formerly Novozymes Biologicals, Ind.)

Tenet WP. Same as Bio-Tam. OMRI-listed. EPA Reg. No. 80289-9. Isagro USA; distributed by SipcamAdvan.

TerraClean 5. 27% hydrogen dioxide and 5% peroxyacetic acid. Generally labeled for control of soil-borne plant diseases such as those caused by *Fusarium* (root rot), *Phytophthora* (blights, rots), *Pythium*, and *Rhizoctonia* on any crop. It penetrates soil to kill and suppress pathogens, and it releases vast amounts of oxygen that stimulates root development, nutrient uptake, and thus plant growth. OMRI-listed. EPA Reg. No. 70299-13. BioSafe Systems, Inc.

Trilogy. 70% clarified hydrophobic extract of neem oil. Labeled generally for several insects and diseases, including *Alternaria*, anthracnose, downy mildew, leaf spot, and powdery mildew in cucurbits. OMRI-listed. EPA Reg. No. 70051-2. Certis USA, LLC.

Zonix biofungicide. 8.5% Rhamnolipid Biosurfactant. Kills zoospores, which is one spore type produced by Oomycete pathogens which cause diseases such as late blight and downy mildews. OMRI-listed. EPA Reg. No. 72431-1. PropTera, LLC.

Below are some organic fungicides in addition to copper and sulfur that are not biopesticides:

JMS Stylet-oil. 97.1% paraffinic oil. Labeled for several insect pests, viruses transmitted by aphids, and some fungal diseases in several crops including *Alternaria* leaf spot, gummy stem blight, and powdery mildew in cucurbits. OMRI-listed. EPA Reg. No. 65564-1. JMS Flower Farms, Inc.

TriTek. 80% mineral oil. Labeled for several insect pests and powdery mildew in several crops including cucumber, melon, and squash. OMRI-listed. EPA Reg. No. 48813-1. Previously named Saf-T-Side. Brandt Consolidated, Inc.

Please Note: The specific directions on fungicide labels must be adhered to -- they supersede these recommendations, if there is a conflict. If you are farming organically, before purchase make sure product is registered in your state and approved by your certifier. Any reference to commercial products, trade or brand names is for information only; no endorsement is intended.