



## F1 Hybrids, OP, Heirloom: what does it all mean?

by Dr. Mac Burgess

Here at Towne's Harvest we put a lot of emphasis on the varieties, or cultivars of the vegetables we grow. We do this to bring you the best produce possible, but also to provide learning opportunities about the differences (or lack thereof) among varieties. Variety selections are made every spring by our farm staff and spring practicum students, under my guidance, in consultation with other MSU faculty, staff, and regional experts. We try to balance respect for tradition with open mindedness for new things.

You may have noticed the "F1" designation after many of the variety names in the weekly newsletter. This means these vegetables were produced from hybrid seed. More specifically it means that the seed we purchased is the first generation of a cross between two distinctly different inbred lines that are maintained for the purpose of generating that hybrid seed. Generally this is done by large seed companies. The resulting F1 generation is then heterozygous for many traits, resulting in increased vigor and uniformity. Think of the mule- combining the patience of a donkey with the intelligence of a horse. And while mules are sterile, if we try to save seeds from F1 hybrids the subsequent generations would revert to a jumble of various traits of the original inbred lines, not all of which are desirable. For this reason, vegetable breeders also use hybridization as a way to make farmers have to buy new hybrid seed every year. While this is disparaged by some, it is a means for vegetable breeders to stay in business, providing funding for ongoing research. In many cases hybrid seeds are truly the best available, or even define qualities that most

consumers expect. There is nothing about producing or using hybrid seed that is inherently incompatible with organic certification. Indeed, much of our hybrid seed is also produced with certified organic practices.

Practically all of the tomatoes, spinach, cucumbers, sweet corn, onions, broccoli, cauliflower, cabbage, peppers, eggplants, kale, carrots, beets, and squash you see in the store have been produced from hybrid seed. To my knowledge there are not commercially available F1 hybrids of lettuce, beans, peas, and a few other vegetables (or wheat for that matter). Sometimes this reflects a lack of return on investment in the process, sometimes it reflects the difficulty of controlling pollination in seed production, and sometimes that the plants are vegetatively propagated, like for garlic and potatoes. You'd probably be surprised that many of the vegetables you find for sale at farmers markets and from other small local producers are grown from hybrid seed.

In our farm records and CSA newsletters we identify F1 hybrids as a matter of transparency, and for the learning opportunity. If a plant variety is not identified as F1, then you can assume it is "open pollinated", or OP, which means the seed comes from a population of plants left to freely pollinate one another or self pollinate as the case may be. In some cases we even save that seed ourselves.

When we grow F1 Hybrid seed it is because we have identified that these hybrids have traits that are valuable to us, or because we are evaluating whether that is the case. For example, you'll note that our Toscano (aka Lacinato, or Dinosaur) kale is OP, while redbor and winterbor kale are F1 hybrids. I like the Toscano kale for its cold weather vigor, unique appearance, and great flavor, but there is no denying that the hybrid "bor"-type kales are more productive through the summer and easier to harvest. We have found from experience here that broccoli as you know it (with heads large enough to be worth paying someone to harvest) realistically only comes from hybrid seed. In the case of onions, carrots, squash, and tomatoes we are actively evaluating and comparing the productivity and flavor of OP varieties and F1 hybrids. In some cases hybrids are the only source of needed disease resistance. In other cases, open pollinated veggies are just as good, or even better, and the seed is almost always cheaper. We are proud to support small and local plant breeders and seed producers where it makes sense to do so.

A third distinction in the seed trade is "heirloom" a word whose meaning is not regulated in the U.S. Generally, heirloom vegetables are open pollinated vegetables that are very old. Not long ago, heirloom tomatoes had legitimate claim to superior flavor, reflecting that breeding efforts had been focused on productivity and suitability for shipping over flavor. In comparison, many heirlooms were delicious but disease prone and difficult to grow, and they bruised easily when being shipped. That distinction is muddied with recent breeding efforts focusing on flavor *and* productivity.

One of our suppliers markets a line of "heritage" hybrid tomatoes that look and taste like classic heirlooms but have the vigor and disease resistance of modern hybrids. These tomatoes are often grafted on another hybrid rootstock resulting in plants that cost over \$2 each just in seed compared to mere pennies for an OP tomato seed. That same supplier also has a line of what they call "artisan" tomatoes- which you might mistake for heirlooms because they taste good, but are actually modern creations of plant breeders. Are you confused yet?

Just one of the tomatoes in this week's CSA share, Cherokee purple has bonafide claim to 'heirloom" status (but we'd struggle to ripen 60 of them in one week), and Sungold (F1) is a prolific and reliable producer of delicious gold cherry tomatoes produced by a Japanese seed company since 1992. While not an heirloom, it sure is a classic in my book, and we keep going back for more seed every year. Finally, Indigo Cherry Drop is a recent development, released by Professor Jim Meyers of Oregon State University in 2015. Indigo cherry drop was bred to taste good, yield well, resist disease, and have increased anthocyanin content for improved nutrition. It is an open pollinated seed (so we could save seed), however it is protected by the Plant Variety Protection Act (PVP), so we couldn't legally sell that seed without paying a royalty to Dr. Meyers' program.

That might be more that you wanted to know on this topic, but since a few people have asked, I thought I'd share this summary. This is an example of the kind of topics we consider in the courses taught through Towne's Harvest Garden, and I appreciate your support of our efforts.

Thank You

Mac Burgess, PhD

Assistant Professor of Plant Science and Plant Pathology



# Things to Remember

- CSA pickup is every Wednesday from 4pm-6pm.
- We do not distribute our CSA's in boxes, so please bring a reusable produce bag to transport your share home in. Small produce bags will be helpful too as we start distributing some vegetables without bags or ties.
- If you can't make it during this time, please email or call us to arrange another time to come get your share. Contact info can be found at the footer of this email.

## "So, what's in the CSA for this week?"

Summer CSA: week 8

We could not be more thrilled to provide you with a bountiful share of hand harvested, hand washed, passion borne fresh vegetables

Ace\* (F1) or Gilboa\* (F1) Green Peppers

Toma Verde Tomatillos\*

Yukon Gold\* New Potatoes

Scarlet Nantes\* or Purple 68\* (F1) Carrots

Dark Star, Raven (F1) and Jackpot (F1) Zucchini

Red Ace (F1) Beets

Mars Celeriac\*

King Richard Leeks

Loose Lacinato, Redbor (F1), or Winterbor (F1) Kale

Walla Walla Sweet Onion

German Red, Korean Red, or Music\* Garlic

Indigo Cherry Drop, Blush, Sakura (F1), or Sungold (F1) Cherry Tomatoes

Black Prince, Black Krim, Pink Berkeley Tie-Dye, Green Zebra\* or Cherokee Purple Slicer Tomato

### **U-pick herbs readily available upon request**

Oregano

Rosemary

Thyme

Lemon Balm

Marjoram

Sage

Lemon Balm

Zaatar

\* = new this week



## Crop of the Week

by Dylan Fishman





Kohlrabi's crazy cousin? Nope... An alien invader? Nope.... A Delicious addition to any soup? Yes! Meet Celeriac, also known as celery root. One of the crops that we grow at Towne's Harvest Garden which you'll be hard-pressed to find in local grocery stores and markets. In fact, this plant is the same exact species (*Apium graveolens*) as Celery just a different variety. Also known as celery root, celeriac is comprised of less foliage than normal celery and a large root that should measure 3-6 inches across at maturity. Celeriac, specifically the root, has a nuttier, more intense flavor than it's more popular relative. It's often used as an enriching flavor rather than eating it alone. Celeriac can be used as an ingredient in stocks, soups, roasts, salads, and mashes. Its flavor combines well with that of other root vegetables such as potatoes, carrots, garlic, and onions (all of which are in this weeks share). Celeriac also has a storage potential of up to 3 months if well kept. To store celeriac, keep it in an air tight container at about 50 degrees F. If cut into, apply some lemon water to the cut-into area of the plant to reduce browning and bacterial growth.

To use this elusive and delicious vegetable, peel the outer skin off of the root as it has a slightly different flavor than the innards. Chop up the tender middle of the root into small pieces exposing a lot of surface area, and throw it into your dish of choice.

Also chop up the foliage of the celeriac and add it into your dish. Make sure to try both the root and foliage to gauge the difference in taste! Celeriac residue in soups can be left in for texture and substance or strained out for a thinner and simpler soup. We hope you enjoy cooking with this strange entity of the vegetable world, and look forward to hearing what you have to say about it next week at CSA pick-up!

## Towne's Harvest Potatoes

by Dylan Fishman



Potatoes are serious business over here at THG! We grow three varieties of potatoes (yukon gold, dark red norland, all blue, and rose finn apple) and pay very close attention to yields, labor efficiency, disease, among many other things. Potatoes present a wonderful opportunity to collect and analyze data because they all get planted around the same time, when we harvest a row of potatoes we harvest all of what's there, they require very little maintenance throughout their growth period, and they're mechanically harvested. By collecting data and analyzing the differences in varieties, between years, and between planting beds we can extrapolate inferences about what to grow more or less of next year, and where to put them on the farm. In the video below you can see us using a tractor implement that we call the potato digger. It's a conveyor belt that digs deep in the soil and makes quick work of harvesting the potatoes. Crews using this implement can get in a wonderful rhythm, or as you can see in this video, potatoes can fly everywhere! There's standard trade-offs when mechanizing any farm process. Mechanization often means that work gets done quicker, but it also means that we have to pay to run the tractor and use fuel. For some crops, the trade-off made with mechanizing the process isn't worth it. Time and time again we've analyzed data and determined that using the potato digger is

the most efficient way to perform the task of harvesting. The potato digger cuts down on labor that would normally consist of using a digging fork and pulling plants and tubers by hand. The implement digs for us, makes the potatoes visible for us to grab, and the tractor holds a bucket that we can drop potatoes into. We harvested 104 kg (224 lbs) of potatoes from one row this week. That would've been a lot digging and hauling harvest totes!

This week you get Yukon Golds - a classic in the potato world. Yukons are an extremely diverse potato because they can withstand boiling, frying and baking - and they look beautiful to boot! Remember, the potatoes this week are new potatoes, and won't be in their best condition longer than a couple of weeks. Use them up quickly!

## Need More Veg?



We hope that our CSA is providing you with enough vegetables for the week! However, if you find yourself craving more of one specific item or larger quantities in general then please come visit us at our campus farm stand every Thursday from 4-6pm at the intersection of Grant and 7th street by the big spinning noodle structure. Get there early for an abundance of tomatoes, basil, onions, garlic, greens, and more! CSA customers get good deals, but you'll have to come to find out!



Need a great summer gift to give to family member, friend, or acquaintance?

Follow the link below to purchase the newest addition to our CSA program - harvest bucks! Harvest bucks



are a gift certificate for our on campus farm stand. Harvest Bucks are unique because you receive an added value of 10% more than what you paid for! For example, if you purchase \$50 of harvest bucks you will receive \$55 worth of coupons to use at our farm stand on anything that you'd like!

If you've already purchased harvest bucks and haven't already received them they can be redeemed at our campus farm stand during any hour of operations.

Farm stand is held every Thursday from 4:00-6:00pm at Montana State University in-between the Student Union Building and Barnard Hall.

<http://townesharvest.montana.edu/communitysupportedag/>



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Contact Dylan Fishman at  
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