

2018 North American Variety Trial Network: Pepper Variety Trials

Instructions for National On-Farm Sites

Context

The Bauta Family Initiative on Canadian Seed Security is partnering with the University of Wisconsin Madison and the Organic Seed Alliance to participate in a pilot year of the North American Vegetable Variety Trial Network. The goal of this network is to create a national platform where existing varieties and new breeding lines can be evaluated for their performance in a range of regional ecological farming conditions through on-farm variety trials.

Most varieties that are sold to vegetable farmers in North America are trialled on a limited number of sites, very few of which reflect the diversity of farming conditions in North America. Through a co-ordinated trialling network across Canada and the U.S., we can gather information about both existing varieties and new breeding lines across a range of farming conditions.

The information gathered through this trialling network will be used to help farmers:

- Identify the best performing varieties in your region, both for market garden production and seed production
- Identify which varieties would be suitable as parents for future regional breeding projects
- Build the capacity of farmers to conduct on-farm variety trials that are useful for their farming operation

We strongly encourage growers to read the **The Grower's Guide to Conducting On-farm Variety Trials** (available here: <https://seedalliance.org/publications/growers-guide-conducting-farm-variety-trials/>) by the Organic Seed Alliance - an incredible how-to-guide on how to implement variety trials on your farm.

Peppers

Peppers (*Capsicum annuum*) will be the first crop trialed through this network, with over 20 farmers across North America conducting variety trials on different types of hybrid, open-pollinated, and new breeding lines of peppers.

Varieties Included

The 2018 Pepper Variety Trials include 8 varieties of bell peppers. The trial includes mostly red varieties with some yellow and or/orange varieties. In Canada, bell peppers will be grown in Ontario, Quebec, Atlantic Canada.

On-farm trial sites are encouraged to **grow 2 plots** of all varieties, but adjustments can be made to accommodate farmers' space constraints. **The only mandatory varieties will be the check varieties for each trial. It is recommended that farmers also trial any line that is identified as a breeding line.** See "How to Arrange the Trial" for further details.

Growers are encouraged to add additional varieties to their on-farm replicates to make the trial even more helpful to their specific farm. Even anecdotal single rep information can be useful for determining varieties to include in future trials.

Full Variety List for 2018

The varieties listed below have “code names” to help ensure a blind trial. **When you plant out the seeds, please only label the varieties using the code names.**

Bell Peppers Varieties:

Variety	Source	Type	Certification	Code
*Ace (Check)	Johnny's	F1	Organic	PB-04
Flavorburst	Johnny's	F1	Untreated	PB-01
Whitney/ZSA ZSA	Seedway	F1	Untreated	PB-02
King of the North	Hudson Valley Seed Company	OP	Organic	PB-05
Early Red Sweet	Turtle Tree Seeds	OP	Organic	PB-06
Peacework	Fruition Seeds	OP	Organic	PB-07
**SBGO 10408	Pan American Seeds/Ball	Breeding Line	Untreated	PB-03
Italian Red Heart	Wild Garden Seed	OP	Organic	PB-08

*Check variety **Breeding line

Material Transfer Agreement

Some of the **bell pepper** varieties in this trial are hybrids and protected breeding lines - to participate in the trial, growers will be asked to sign a Material Transfer Agreement (MTA) that requests growers not to sell seed or breed from any of these lines without permission from the original plant breeder of that variety. MTAs will be provided shortly after farmers receive the seed.

Planting and Cultivation Recommendations

The table below provides *suggestions only* based on practices advised by the Northeastern Organic Vegetable Improvement Collaborative (NOVIC) trials in the U.S. For on-farm trial sites, growers should adhere to their own planting specifications. **The trial should be grown as you would normally grow peppers, including your normal bed and row spacing - the purpose of on-farm trials, is to test them on your farm!**

Seeding and transplant dates	<ul style="list-style-type: none">● Seed in greenhouse 6-8 weeks before last frost (average early-April)● Transplant after last frost (average mid-June)● Seeding and transplant dates should be adjusted depending on weather conditions and your normal dates for peppers● 50/72 cell plug trays are standard sizes● Seed in cell trays, flats, soil blocks, or nursery beds as you wish.● Growers will receive 20 seeds per rep per variety, start all 20 to account for losses in germination
Plants per Variety	<ul style="list-style-type: none">● 12 plants per variety per replication including check varieties● Hub sites: 3 replications● On-farm sites: 2 preferred
Row and bed spacing	<ul style="list-style-type: none">● 18" in-row spacing● 7' between-spacing● Adjust spacing accordingly based on your planting regime, the more space you give, the more you can optimize yield and disease pressure
Other planting specifications	<ul style="list-style-type: none">● Black plastic is preferred, but not required● Drip irrigation is highly recommended● Trellising peppers is recommended to prevent lodging from heavy fruit load
Harvesting instructions	<ul style="list-style-type: none">● Fruits should be harvested from 10 plants per plot (excluding the two plants at the edges of each rep)● Harvests should occur once weekly for 4-6 weeks (or until frost) after the earliest peppers have approximately 5 ripe fruit on average

How to Arrange the Trial

We strongly encourage growers read [On-Farm Variety Trials](#) by the Organic Seed Alliance - an incredible how-to-guide on how to implement variety trials for your own farm.

The trial arrangement is flexible as long as you plant 12 seedlings per variety per replication and that the varieties are randomized within each replication. If the trial is too big for your space/time, please select the varieties that you think are the most important to do replications for, and plant an observational trial (single replication) of the variety(ies) you cannot do multiple replications for.

Please observe the layout below as an example of how you can organize your trial:

Bell Pepper Trial Sample:

It is essential that you randomize the planting of varieties *within each replication*

Border			
Border	Replication 1	Replication 2	Border
	Check (Ace)	SBGO 10408	
	King of the North	Flavorburst	
	SBGO 10408	Italian Red Heart	
	Peacework	Early Red Sweet	
	Zsa Zsa	King of the North	
	Italian Red Heart	Peacework	
	Early Red Sweet	Check (Ace)	
	Flavorburst	Zsa Zsa	
Border			

* Adapted from OSA On-Farm Variety Trials 2018

Please observe these best practices to the extent possible:

- A border around your trial of buffer crops not included in your trial is recommended to prevent crop loss from mechanical damage or pests/critters. The crops that make up the border can be other varieties peppers, or other types of crops.
- Avoid the edge of the field and the end of the bed when finding a place for the trial, as well as any areas with known soil, shade or irrigation differences that would affect some plots more than others.
- If possible, plant the trial in a spot where it has the same crop on either side of it.
- Field stakes will be provided to growers shortly after receiving the seed. Use these stakes to label the plots AND draw a field map showing the order and location of varieties. This serves as a backup in case the stakes get lost!

If you do not have enough space for 2 replicates for all the varieties of the trial (i.e., 2 plots of each variety), you can either:

1) reduce the number of varieties included and do 2 plots of fewer varieties

or

2) do a single plot of most varieties and 2 plots of the check variety only, distributed randomly across the trial.

Evaluation

Ultimately, the purpose of gathering data for the trial is to answer these three questions:

1. Does this pepper variety work well on your farm?
2. Is it a suitable candidate for on-farm seed production?
3. Is it a suitable candidate for future breeding projects?

Data will be collected in a systematic way to help answer those questions. Evaluation forms are still being finalized for the trial and will be provided shortly after farmers receive seed for the trial. The evaluation forms will be quite simple, requesting farmers to evaluate the following information throughout the trial:

- Would you grow this variety again?
- How marketable is this variety?
- Please rate the flavour and productivity of the variety
- Are there any disease/insect/stress problems related to the variety?

Growers will also be asked to make note of:

- Soil type
- Prior crop to planting
- Planting method
- Planting dates
- In-row/between-row spacing
- Mulch used
- Fertilizer applied
- Pest/disease treatments
- Trellising methods used