



Western NC Organic Broccoli Variety Trial, Summer 2014

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Introduction

Through funding from the Organic Farming Research Foundation, our 2014 participatory organic broccoli variety trials built on the project we started in the 2012 and 2013 seasons to assess appropriate varieties for summer production in western North Carolina (WNC). Involvement of farmers in variety selection, testing, and evaluation were critical to the project. In the 2013 replicated mother trial, conducted on the Mountain Research Station certified Organic Unit, 29 open-pollinated and hybrid broccoli varieties were screened. In 2014 we conducted a series of non-replicated baby trials on the research station and on three organic farms to further evaluate the six top performing varieties identified in the 2013 mother trial.

Variety Selection and Sources

Variety	Type	Seed Source
Umpqua	OP	Southern Exposure Seed Exchange
Belstar	Hybrid	Johnny's Selected Seeds
Bay Meadows	Hybrid	Johnny's Selected Seeds
Green Magic	Hybrid	Johnny's Selected Seeds
Gypsy	Hybrid	Johnny's Selected Seeds
Packman	Hybrid	Harris Seeds

Varieties were selected based on their performance under organic conditions for a variety of qualities grown over the summer months in WNC. 2012 and 2013 results from Mountain Research Station mother trials of 20 heading type broccoli showcased these 6 varieties to move forward to the on-farm baby trials.

Trial Locations

Four locations trialed all 6 varieties in 2014, the Organic Unit of the Mountain Research Station in Waynesville, NC and three organic farms located at different elevations in WNC and southwest Virginia.

Replication	Location	Elevation (feet)	Seeding Date	Transplant Date
1	Waynesville, NC	2,700	5/15/2014	7/1/2014
2	Grassy Branch, NC	2,800	5/15/2014	7/7/2014
3	Marble, NC	1,680	6/7/2014	7/14/2014
4	Castlewood, VA	1,800	5/22/2014	7/11/2014

Production Practices

Broccoli was grown under certified organic management with raised beds, three out of four sites utilized white plastic mulch. Fertility included standard organic fertilizers; in some locations compost and crop rotation/cover crops primarily. Additional boron was applied at all trial sites. Drip irrigation was applied as needed, particularly in high temperatures of June/July. 5.5 foot between row spacing on centers, 12" plant spacing on double rows.

Pest management included Bt products for caterpillars, various management trialed by different growers for flea beetle and harlequin bug pests including pyganic and other product rotations. Trap cropping was implemented for beetles and farmscaping for beneficials.

Disease management included copper products and others for alternaria, and downy mildew at one trial site. We are planning to increase project focus on pest management during summer months for next year's trials.

Data Collection and Results Summary

Quantitative data collected for the 2014 baby trials included the number of marketable and unmarketable heads as well as the weight of crown and sideshoot harvest. Quality traits rated included plant vigor, bead uniformity, head firmness, and overall quality. Insect and disease data collected included harlequin bug and alternaria susceptibility.

Based on preliminary data from the 2012-2013 mother trials as well as 2014 on-farm baby trials, there are clear best performing varieties recommended for summer production in western North Carolina. Yield, heat tolerance, and insect/disease resistance were identified by regional stakeholders as high-priority traits when selecting varieties. The following varieties are listed in order of best performance over-all during the 2012-2014

trial seasons: Bay Meadows, Packman, Umpqua, Belstar, and Green Magic. The following highlights which varieties were most promising according to these trait categories.

Yield

Both crown harvest and sideshoot harvest data were taken into account when determining recommendations. Measuring sideshoot yield provided unique information, useful to growers that rely on secondary harvest for direct market sales. Based on mother trials, we identified top performers as Gypsy, Blue Wind, and Packman. Total yield was highest for Bay Meadows, Belstar, and Green Magic in 2014 baby trials. In addition to the industry standard (Packman) growers should consider these varieties to improve overall yield.

Heat Tolerance/Summer Production

Producing a summer broccoli crop is attractive for higher elevation growers. Fresh broccoli can fetch higher prices in wholesale and direct markets when conditions throughout most of the southeast are not favorable for production. However, growers must still contend with heat stress. Heat tolerance quality ratings (head uniformity and head smoothness) in both years of mother trials suggest Bay Meadows, Gypsy, Belstar, and Packman as best options for regional growers. 2014 baby trials results confirm that Bay Meadows, Umpqua, Packman, and Green Magic are suitable choices for heat tolerance under regional growing conditions.

Insect and Disease Resistance

More data specific to insect and disease resistance will be collected in future trial years. Our 2012-2013 mother trials indicated that Bay Meadows and Batavia were most promising for early and mid-season (0-60 days) resistance to Alternaria leaf spot. When compared to the industry standard (Packman), Arcadia, Belstar, Blue Wind, De Cicco, Diplomat, Fiesta, Premium Crop, Umpqua, and Waltham 29 showed greater Alternaria resistance. 2014 baby trials data suggests Bay Meadows and Umpqua are less prone to Alternaria and brassica Downy Mildew diseases, consistent with 2012-2013 mother trial results for Alternaria.

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