

UPDATE ON HEAT TOLERANT VARIETY DEVELOPMENT AND PLANT POPULATION EFFECTS ON YIELD AND QUALITY FOR BROCCOLI

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The Eastern Broccoli Project is developing new broccoli varieties that will tolerate eastern summer heat without deforming, and thereby making it a reasonable risk to produce this crop. This public-private partnership is identifying suitable germplasm at seed companies, and having seed companies incorporate superior eastern adaptation that has been developed by public breeding programs at Cornell University, USDA's Vegetable Laboratory, and Oregon State University. The main issue is that eastern growers need varieties that make uniform buds on evenly domed heads even when summer nights remain warm. Such varieties should make it possible to extend the fall harvest season into August, and make spring production a reasonable proposition.

In our trials of materials already in the seed companies' pipeline, or not in current production, we identified several that perform as well as, or better than the most popular lines in the East. Among these are DuraPak 16 and DuraPak18 from Syngenta and BC1691 and Lieutenant from Seminis. Finding this incremental advance even in the first year is unexpectedly good progress.

For 2012, both seed companies and public breeders provided newly made crosses that are intended to fit eastern conditions better. We tested 39 lines at five locations across the East, and found that these first new crosses included many that exceeded the performance of the best eastern varieties. This result gives an indication that the project will result in substantial improvements in variety choice for eastern growers.

In order to be profitable with this very competitive crop, growers need to take full advantage of the high productivity of our soils. Our results suggest that growers can raise their yield goal and plant population to make the economics more attractive. Current eastern yields are often about 400 to 450 boxes per acre, using single rows with in-row spacing of about 12 inches. We tested the yield potential by using an excellent Honeoye soil, providing abundant water and fertilizer, and raising the plant population. Raising only fertility tends to cause thicker, faster-growing stems that are prone to become hollow. That defect can cause the crop to be rejected. A higher population keeps the stems thinner.

We found that the optimal population for yield, quality, and number of cuts was 40,000 plants. In-row spacing of 8 inches worked well. Going down to 6 inches caused too many plants with no marketable head. A between-row spacing of 15 inches worked well in a 3-row bed. At this population yields were 600 to 800 boxes per acre. Generally, that yield difference with essentially the same growing cost would increase profit by several thousand dollars per acre.