

Fall Broccoli Cultivar Trial, Northwestern Kentucky

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Introduction

Broccoli has become a reliable fall vegetable crop in western Kentucky in a double cropping system. Many farmers are utilizing black plastic and drip irrigation lines that had been previously used for a summer crop such as peppers or squash. Others are using bare ground and planting broccoli after tobacco harvest. This allows farmers to grow two crops from the same piece of ground in one year. The West Kentucky Grower Cooperative in Owensboro is able to market this broccoli in the fall of the year. We wanted to conduct a cultivar trial with broccoli to determine quality and yield characteristics of new cultivars as well as those currently raised in this region.

Materials and Methods

The trial was conducted in cooperation with a vegetable grower in McLean County in the fall of 2004. The field had cucumbers that were raised in the summer, and they were sprayed with glyphosate as a burn down before transplanting broccoli. Seed for eight broccoli varieties was obtained from Seedway and seeded in the greenhouse on 5 July. Plants were transplanted on 24 August by hand. The trial was arranged as a randomized complete block design with four replications. Each plot had 20 plants in 18-in.-wide double rows with 15 in. between plants within the rows. The grower applied 50 lbs. N/acre pre-plant through the drip system, and no P and K was applied, another 50 lbs. N/acre was side-dressed when broccoli heads developed. The field was scouted twice weekly and when unacceptable numbers of insects were found, insecticide was applied. One application of Pounce and one application of Capture were used for beet armyworm and cabbage looper control.

The broccoli trial was harvested whenever the majority of plants of each variety had acceptable heads for market. The plot was harvested four times between 20 October and the 3 November. We determined and recorded maturity, percentage marketable yield, yield per acre, and percentage hollow stem.

The cooperative markets broccoli in two grades, bunch and crown cut. Bunch is usually has a smaller head size and a lot of stem is left so it can be banded with another head. Fourteen bunches are boxed for direct sales in grocery stores. The crown cut doesn't have as much stem attached and usually the head is larger. Crown cut is packaged loose and usually around 30 heads are paced in a box for restaurant sales. Therefore, each variety was also graded on percentages of crown vs. bunch cut at the each harvest. All data were analyzed by analysis of variance.

Results and Discussion

The top yielding variety was Windsor, also the earliest maturing variety in the plot (Table 1). This variety has been used as the standard in this area for a few years. A high percentage of broccoli harvested from Windsor was graded as a crown cut. The color of this variety was purplish green at harvest, and it was also the variety with the highest number of small leaves extruding from the middle of the head. The grower would have to determine if the prospective buyer would object to the presence of these small leaves on Windsor. Gypsy yield was second to

that of Windsor and was not significantly different from Windsor. Gypsy also had more crown than bunch cut. The marketable percentage for Gypsy was the lowest of all the cultivars because of head browning that was diagnosed as bacterial head rot. Another variety with bacterial head rot was Patron. Patron and Gypsy both had looser and flatter heads, and the wet season likely contributed to disease presence in these varieties. Green Magic, Diplomat, and Liberty all yielded more than 150 boxes/A, had high marketable percentages, good quality ratings, and were mid-season varieties. Coronado Crown had the lowest yield. This variety had more bunch cut broccoli than any other cultivar.

Hollow stem was seen in some varieties in the plot (Table 1). This condition occurs during very rapid growth periods. High temperatures and high levels of nitrogen also are thought to contribute to this condition. The cultivars Liberty and Belstar had very large stems and a high percentage of hollow stem was present in these two cultivars.

In conclusion this trial provides evidence that yields of Windsor and Gypsy were the best of the tested cultivars. The quality of Gypsy was less than desirable but Windsor was solid in this category except for the leaf protrusion. Therefore, Windsor seems to be a good early variety. For the midseason, Green Magic and Diplomat seem to be good cultivars with decent yield and good quality. Growers need to use caution in trying new varieties in the field. Always grow small amounts the first year and compare them to your standard variety.

Table 1. Yield, maturity, and quality of eight broccoli cultivars grown in McLean County, 2004

| Variety (Source) | Yield^{1,2} (boxes/A) | Crown Cut (%) | Bunch Cut (%) | Hollow Stem² (%) | Mkt. % | Net income³ | # Days to harvest⁴ | Shape⁵ | Color⁶ | Bead Size⁷ | Leafy⁸ |
|-------------------------|---|-------------------------|-------------------------|---------------------------------------|------------------|-------------------------------|--------------------------------------|--------------------------|--------------------------|------------------------------|--------------------------|
| Windsor (SW) | 221 a | 69 | 31 | 25 c | 95 | 1042 | 57 | 4 | 4.5 | 1.5 | 1.5 |
| Gypsy (SW) | 217 a | 65 | 35 | 36 abc | 83 | 1034 | 61 | 3 | 4 | 2.5 | 0 |
| Green Magic (SW) | 188 ab | 60 | 40 | 16 c | 97 | 902 | 60 | 3.5 | 3.5 | 2.5 | 1 |
| Diplomat (HR) | 174 abc | 55 | 45 | 29 bc | 96 | 830 | 66 | 4 | 3.5 | 3.5 | 0 |
| Liberty (SM) | 158 abc | 51 | 49 | 59 a | 97 | 766 | 68 | 4 | 4 | 2.5 | 0 |
| Patron (SW) | 144 bc | 49 | 51 | 30 bc | 89 | 701 | 69 | 3 | 4 | 2.5 | 0 |
| Belstar (SW) | 112 c | 51 | 49 | 58 ab | 96 | 525 | 68 | 4.5 | 4.5 | 3.0 | 0 |
| Coronado Crown (SW) | 107 c | 36 | 64 | 12 c | 97 | 497 | 63 | 4 | 4 | 3.0 | 0 |

¹ Sorted by total yield.

² Means followed by the same letter are not significantly different as determined by Waller-Duncan LSD (P 0.05).

³ Net income returned to grower after co-op commission and charges and before production expenses.

⁴ Number of days from transplant to first harvest.

⁵ Head shape score; 1=flat, 5= high dome.

⁶ Head color score; 1-2=yellow to light green, 3-4=medium to dark green, 5=purplish green.

⁷ Bead size score; 1=very small and fine, 5=very large and coarse.

⁸ Score for extrusion of small leaves through the head; 1=no leaves, 5=very leafy.