

Broccoli Variety Demonstration Trial 2015

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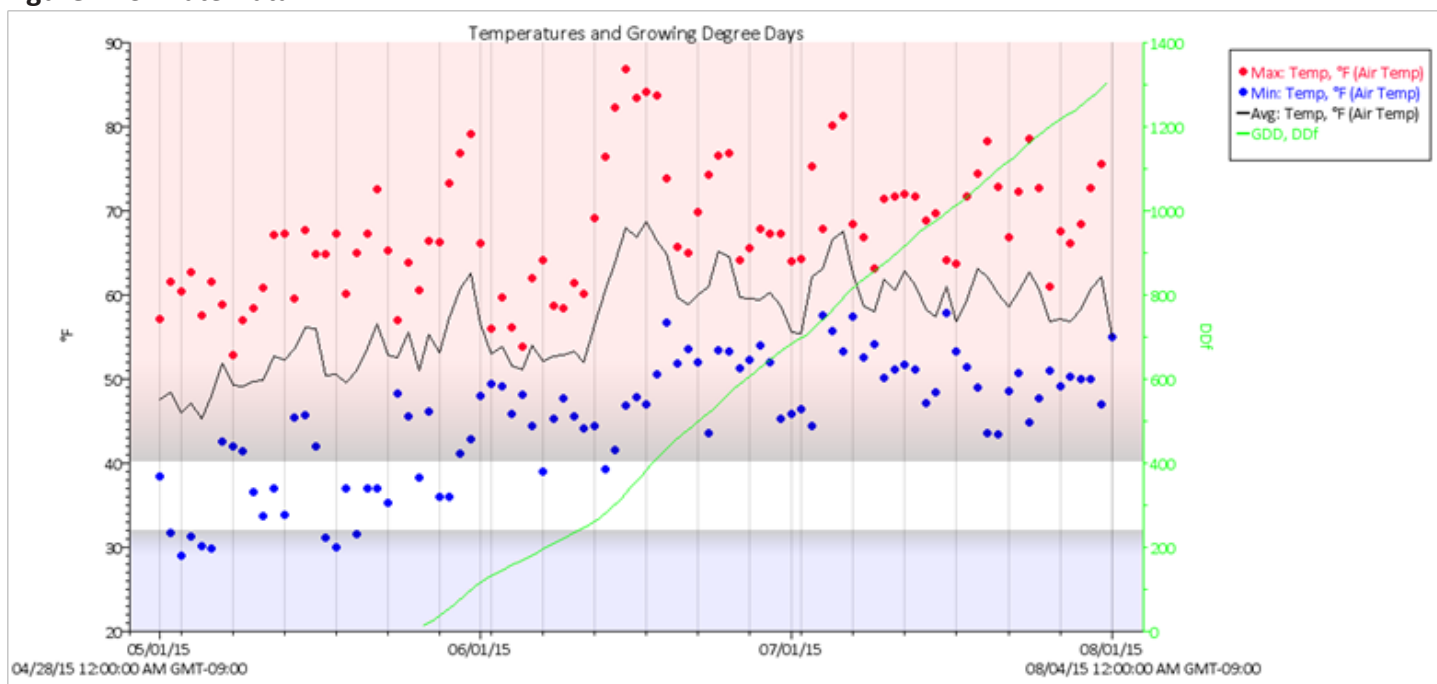
Introduction

Broccoli is a cool season crop that does poorly in hot weather, which makes it a favorable crop for production in the cool summers of Southcentral Alaska. However, farmers in Alaska need updated information on new and old varieties available for commercial production. The Alaska Plant Materials Center, located 5.4 miles south of Palmer, Alaska, conducted a broccoli variety demonstration trial for the second year. It is important to note these trials must be conducted over several growing seasons in order to provide sufficient evidence that these varieties will perform well overall in the region. The new varieties are grown alongside traditional or standard varieties for quality comparison purposes. Commercial production of new varieties should only be considered after several years of variety trials are successful with initial plantings on a small production scale.

Overview

Ten broccoli varieties were evaluated at the Alaska Plant Materials Center. The soil is described as a Kidazqeni-Nikalson Complex. The varieties chosen and the seed source are as follows: Arcadia, Belstar, Blue Wind, Diplomat, Green Magic – Johnny’s Selected Seeds, Bonanza – Burpee, Coronado Crown, Packman – Park Seed, Green King, Waltham #29 – Fedco Seeds. **Figure 1** shows local climate data along with growing degree days.

Figure 1. Climate Data



Methods

Ten broccoli varieties were evaluated using a randomized complete block design with four replications in double row raised beds, 16 feet long, with 39 inches between beds, and 18 inches between rows. The plants were spaced 8 inches within the row. The area was tilled and fertilized with 100 lb. N, 100 lb. P_2O_5 , 100 lb. K_2O per acre after planting. The seeds were germinated in 288 plug trays with a commercial peat germination mix and maintained at 72°F in a greenhouse. After germination, the seedlings were maintained at a minimum temperature of 55°F. The flats were watered as required and fertilized with Peat-Lite Special, 15-16-17 at the rate of 100 ppm N. The seedlings were transplanted into 72 plug trays until ready for planting. They were moved outside the greenhouse to a protected area to harden off after four weeks in the greenhouse. After being outside for one week, the seedlings were transplanted into the field on May 26. Irrigation was supplied through one row of drip tape per row of plants. The plots were checked two times per week for mature terminal heads. The growing degree days were calculated using a base temperature of 40°F.

Results

There was a high incidence of early bolting with all of the earlier maturing varieties (**Table 1**); Bonanza, Bluewind, Packman, Waltham #29 and Green King. The terminal heads were extremely undersized possibly due to the unusual warm temperatures experienced after planting. The later varieties: Belstar, Green Magic, Coronado Crown, Diplomat and Arcadia were still monitored as they began to develop terminal heads (**Table 2**). The terminal heads that did not bolt were harvested on July 23. The remaining varieties were destroyed by moose before the terminal heads reached maturity and could be harvested. The lateral heads were not monitored or harvested.

Table 1. Broccoli Bolting Data

VARIETY	PERCENT BOLTED	VARIETY	PERCENT BOLTED
Arcadia F1	0	Diplomat F1	0
Belstar F1	0	Green King F1	13
Blue Wind F1	93	Green Magic F1	2
Bonanza F1	70	Packman F1	83
Coronado Crown F1	0	Waltham #29	25

Table 2. Broccoli Average Terminal Head Size

VARIETY	AVERAGE HEAD SIZE	VARIETY	AVERAGE HEAD SIZE
Arcadia F1	Unknown ¹	Diplomat F1	Unknown ¹
Belstar F1	Unknown ¹	Green King F1	2.5 ⁴
Blue Wind F1	3.7 ²	Green Magic F1	2.3 ⁵
Bonanza F1	2.9 ³	Packman F1	3.6 ⁶
Coronado Crown F1	Unknown ¹	Waltham #29	2.1 ⁷

1. Terminal heads were not harvestable.

2. n = 3

3. n = 15, one plant did not produce a terminal head.

4. n = 45, 40 plants did not produce terminal heads.

5. n = 37, 12 plants did not produce terminal heads.

6. n = 22, one plant did not produce a terminal head.

7. n = 18, 23 plants did not produce terminal heads.

n = number of samples measured

Conclusion

The earlier varieties, Bonanza, Blue Wind, Packman, Green King and Waltham #29 did not tolerate high temperatures after being planted in the field. They all developed less than desirable sized terminal heads and bolted early. The later varieties, Belstar, Coronado Crown, Green Magic, Diplomat and Arcadia were not affected as much as the earlier varieties and developed terminal heads. Cole crops are extremely susceptible to local browsing moose. The broccoli plot was found by local moose and visited daily until every head was consumed. Another trial will be conducted again in 2016 and will be located in a protected fenced area.