MANAGING SUGARBEET CROP IN AREA WITH MULTIPLE DISEASES

Mohamed F. R. Khan[1] and Randy Nelson[2]

[1]Extension Sugarbeet Specialist, North Dakota State University & University of Minnesota
[2]Research Technician, Plant Pathology Department, North Dakota State University

INTRODUCTION AND OBJECTIVE

Rhizomania has become more widespread in the Red River Valley with more Rhizomania resistant varieties being grown. Soils that are warm and wet are favorable for the development of Rhizomania. Warm and wet soils are also favorable for the development of Fusarium yellows, Aphanomyces, and Rhizoctonia crown rot – diseases that are also becoming more prevalent in the Red River Valley. The presence of multiple diseases in a field is becoming more common. As such, growers need to manage the sugarbeet crop for multiple diseases.

The objective of this research was to determine the effect of varietal resistance and fungicides for controlling multiple diseases of sugarbeet.

MATERIALS AND METHODS

Research was conducted at Glyndon, MN in 2006. Field plots comprised of six 30-feet long rows spaced 22 inches apart. Plots were seeded with Beta 4797, Beta 3820 and VanderHave 46519, all treated with Tachigaren (45 g/kg seed), on 26 April. Terbufos (Counter 15G) was applied modified in-furrow at 12 lbs/A during planting to control sugarbeet root maggot (*Tetanops myopaeformis* von Röder; Diptera: Otitidae). Plots were thinned manually at the 6-leaf stage to 41,580 plants per acre. Weeds were controlled with recommended herbicides (Khan, 2006), and hand weeding.

The experimental design was a randomized complete block with four replicates and nine treatments. Treatments included 1) Beta 3820 (conventional variety); 2) Beta 4797 (Rhizomania resistant); 3) VDH 46519 (Rhizomania resistant); 4) Beta 4797 + Fluopicolide; 5) VDH 46519 + Fluopicolide; 6) Beta 4797 + Fluopicolide + Quadris; 7) VDH 46519 + Fluopicolide + Quadris; 8) Beta 4797 + Quadris; 9) VDH 46519 + Quadris. Fluopicolide was applied as a seed treatment at 25 g a.i./kg seed. Quadris was applied at 9.5 fl oz/A in a 7 inch band to the middle four rows of plots using a hand held sprayer operating at 40 psi with 8001 EVS nozzles delivering 20 gpa on 12 June. Plots were defoliated mechanically and harvested using a mechanical harvester on 26 September. The middle two rows of each plot were harvested and weighed for root yield. Twelve to 15 random roots from each plot, not including roots on the ends of the plot, were analyzed for quality at the American Crystal Sugar Company Quality Tare Laboratory, East Grand Forks, MN. The least significant difference (LSD) test was used to compare treatments when the F-test for treatments was significant (p=0.05). The data analysis was performed with the ANOVA procedure of the Agriculture Research Manager, version 6.0 software package (Gylling Data Management Inc., Brookings, South Dakota, 1999).

RESULTS AND DISCUSSIONS

The Glyndon site was selected because it was suppose to have had heavy Rhizomania infection three years earlier. Unfortunately, no symptoms of Rhizomania were observed, probably because of the dry conditions during the growing season. However, the Rhizomania resistant varieties had higher root yield and recoverable sucrose than the conventional Rhizomania susceptible variety. There was a general trend, with the exception of Beta 4797 and Quadris treatment, for the fungicides to increase root yield and recoverable sucrose of the Rhizomania resistant varieties.

REFERENCE

Khan, M. 2006. 2006 Sugarbeet Production Guide. North Dakota State University and University of Minnesota Extension Services, pp. 24-55.

Table 1. Effect of variety and fungicides on yield and quality at Glyndon in 2006.

Treatment	Recoverable sucrose (lb/A)	Recoverable sucrose (lb/T)	Root yield (t/A)	Sucrose content (%)	Sucrose loss to molasses (%)
Beta 4797	10577	312	33.9	16.95	1.25
Beta 4797 + Fluopicolide	12041	300	40.1	16.60	1.35
Beta 4797 + Quadris	10354	307	33.7	16.83	1.33
Beta 4797 + Fluopicolide + Quadris	10725	301	35.6	16.54	1.28
Beta 3820 (Conventional variety)	9390	306	30.7	16.55	1.13
VDH 46519	10301	294	35.0	16.14	1.28
VDH 46519 + Fluopicolide	12174	286	42.5	15.85	1.35
VDH 46519 + Quadris	12341	292	42.2	16.06	1.32
VDH 46519 + Fluopicolide + Quadris	11509	291	39.5	16.08	1.32
LSD (p=0.05)	2510	16	8.7	0.70	0.19