

KHAN, MOHAMED F. R.¹, ISSA QANDAH¹ and MELVIN D. BOLTON^{2*}, ¹Department of Plant Pathology, Walster Hall 306, North Dakota State University, Fargo, ND 58105 and ²USDA, Agricultural Research Service, Northern Crop Science Laboratory, Fargo, ND 58105. **The effect of temperature on Rhizoctonia disease development and fungicide efficacy in controlling Rhizoctonia root rot on sugarbeet.**

ABSTRACT

Rhizoctonia solani AG 2-2 is the causal agent of Rhizoctonia root and crown rot in sugarbeet. This disease has recently been increasing in occurrence and severity in sugarbeet production areas in the Red River Valley of Minnesota and North Dakota. Since the intraspecific groups AG 2-2 IIIB and AG 2-2 IV both cause Rhizoctonia root and crown rot and are both prevalent in the Red River Valley, our objectives were to compare disease development of these intraspecific groups at four different soil temperatures under controlled climate conditions. A second objective was to determine the efficacy of several fungicides at the temperature determined to be optimal for disease development. Trials were conducted using growth chambers set at four different temperature regimes (10, 15.6, 21.1 and 26.7°C). No disease development occurred at 10 and 15.6°C. However, AG 2-2 IIIB, but not AG 2-2 IV, showed significant disease development at both 21.1 and 26.7°C during the two-week post inoculation evaluation period. Efficacy of several classes of fungicides was tested at 26.7°C since this was the temperature most conducive to disease development. Application of azoxystrobin completely controlled the disease down to 0.336 L ha⁻¹ (half the label rate) but not at 0.168 L ha⁻¹ (quarter label rate) while prothioconazole controlled the disease only at 0.365 L ha⁻¹ (full label rate). Difenconazole at 0.512 L ha⁻¹ (full label rate) was not effective at controlling Rhizoctonia root rot.