

Impact of topography, N fertilization and fungicide application on leaf spot diseases, yield and seed quality of wheat in north-central Saskatchewan

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Abstract

Best management practices for the application of nitrogen (N) fertilizer and fungicides to wheat (*Triticum aestivum* L.) in the Parkland region of the Great Plains might be improved through use of precision farming technology. The objective of this study was to determine the effects of slope position, N fertilization and foliar fungicide application (propiconazole) on wheat seed and biomass yield, leaf spot disease severity, seed quality and uptake and recovery of applied fertilizer N. Field experiments were conducted from 1998 to 2001 at Prince Albert, Saskatchewan. As N rate was increased seed and biomass yield, protein content and N uptake in seed increased in most years, and leaf spot severity increased in some years. Emergence, thousand kernel weight (TKW), bushel weight (BW) and percentage of plump seeds declined as N rate increased in some years. Compared to lower slope positions, the upper slopes had greater severity of leaf spot diseases and lower TKW, BW, percentage of plump seeds and seed protein. Seed and biomass yield in the zero-N treatment were greater on lower slope positions than on upper. The response of seed and biomass yield and N uptake to increase in N rate was relatively greater at upper slope positions than at lower but only in one year. Foliar fungicide application reduced leaf spot disease severity and increased TKW, percentage of plump seeds, protein content in seed, and seed yield. The response of seed yield to fungicide was usually the greatest on upper slopes with increased N rate. The findings suggest targeting of fungicide for control of leaf spot diseases to upper slope positions with high N fertility may be a good strategy, although the results do not consistently support any preference for N fertilization at upper or lower slope positions.