THE EFFECTS OF ANNUAL RYE (*LOLIUM MULTIFLORUM*) ON NATIVE PLANT ESTABLISHMENT WHEN SEEDED AS A NURSE CROP IN A PRAIRIE RECONSTRUCTION

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Abstract: Iowa Department of Transportation (DOT) utilizes annual rye (*Lolium multiflorum*) as a nurse crop (seeded with prairie grasses and forbs) to reduce weeds in new prairie reconstructions. Their seed mixes include annual rye at a seeding rate of 5.6 kg/ha (5.0 lbs/ac). We hypothesized that planting annual rye with the prairie seed will reduce weed growth and also reduce prairie plant establishment. In 2004, experimental plots were established in the right-of-way along U.S. 20 in Black Hawk County. Plots were sprayed with glyphosate to kill the established non-native cool-season grasses in late spring 2004 and seeded with annual rye and prairie grasses/forbs in early June 2004. Prairie plant emergence, growth, richness, and weed growth were compared at three different seeding rates of annual rye: No Rye (control), Rye (5.6 kg/ha - 5.0 lbs/ac), and 2x Rye (11.2 kg/ha - 10.0 lbs/ac). Data was collected in 2004 and 2005. Native plant establishment was reduced by 22.0% and 36.5% in Rye and 2x Rye plots, respectively, as compared with the No Rye controls. The addition of annual rye reduced weed growth up to 40.7% in the first year; however, weed growth in Year 2 was 13.3% and 15.8% higher in Rye and 2x Rye plots than the weed growth in control plots. Based upon the results of this experiment, seeding annual rye as a nurse crop with the prairie seed will decrease native plant establishment and only temporarily reduce weed growth. It is recommended that annual rye be excluded as a nurse crop in prairie reconstructions.