

Determining the Feasibility of Early Seeding Canola in the Northern Great Plains

Chengci Chen *, Grant Jackson, Karnes Neill, David Wichman, Gregory Johnson and Duane Johnson

Abstract

Canola (*Brassica napus* L.) yield is often limited by heat and water stress. Early seeding may avoid the heat and water stress at critical growth stages but will encounter low soil temperatures and frequent frosts. Three experiments were performed at two locations in Montana from 2002 to 2004 to determine (i) early spring seeding effect on seed yield and oil content and optimum seeding rates for early seeding, (ii) base temperature (T_b) for germination and heat requirement for emergence, and (iii) suitable cultivars for early spring seeding. Late-March-seeded canola yielded 0 to 5% greater than mid-April seeding. Delaying seeding from mid-April to mid-May resulted in 43 to 63% yield reduction. Oil content was 12 to 22 g kg⁻¹ greater for mid-May seeding than mid-April seeding in 3 out of 5 site-year combinations. A seeding rate of 32 to 65 seeds m⁻² was found sufficient to produce optimum yields. Oil content tended to decrease 10 to 20 g kg⁻¹ when seeding rate increased from 11 to 97 seeds m⁻². The T_b for germination was less than 4°C, and the growing degree days for 50% emergence (GDD50) were 42 to 81. Yield was negatively correlated ($r = -0.46$ to -0.65) to the days to 50% flowering, and biomass measured at 60 d after planting was negatively correlated to the chlorophyll fluorescence ratio (F_v/F_m) after cold stress ($r = -0.58$). The optimal seeding period for the region is between late March and mid-April. Several genotypes were found to have favorable characteristics for early seeding.

Copyright © 2005. American Society of Agronomy. American Society of Agronomy

The full paper of this abstract was published in Agronomy Journal, in volume 97, on pages 1252-1262.