
Lentil Canopy Modification Through Architecture and Stem Stiffness

T.G. Hanlan, R.A. Ball, A. Vandenberg

Department of Plant Sciences, University of SK,
51 Campus Drive, Saskatoon, SK S7N 5A8

Abstract

Current large green lentil cultivars similar to the cultivar Laird are susceptible to lodging in Saskatchewan. The goal of the study was to identify characteristics of lentil canopy architecture that will lead to reduced lodging and improved yield and quality. Four stiff-stem ICARDA (FLIP) breeding lines varying in leaf size and canopy openness were compared to large green and other locally adapted cultivars at three population densities in the field in 2001 and 2002. Canopy measurements included stand establishment at seedling emergence, biomass and light interception at weekly intervals, stem stiffness, lodging score, end of season harvest index, yield, maximum height and branch number. Cultivars adapted to Saskatchewan had greater biomass, higher final branch number, and greatest overall plant height, but large green cultivars with canopy development similar to Laird had weak stems and were more prone to lodging. Two FLIP lines had less branching and lowest overall plant height, resulting in less biomass and reduced lodging compared to locally adapted cultivars. The other two FLIP lines had intermediate canopy characteristics. Crimson and CDC Milestone responded similarly to FLIP genotypes, but were more similar to the large green cultivars for lodging and biomass. CDC Milestone and Crimson had improved canopy architecture compared to large green cultivars. Cultivars adapted to Saskatchewan had significantly greater yields compared to unadapted FLIP lines. CDC Milestone had highest harvest index and the Laird types had the lowest harvest index. Reduced branching and biomass accumulation may be useful traits to help reduce lodging. Crosses between locally adapted cultivars and several FLIP lines have been made to improve lodging resistance in future cultivars.