

Effect of sowing density on seed yield and quality of Westerwold ryegrass (*Lolium multiflorum ssp. westerwoldicum*) in Finland

M.Niskanen¹ & O.Niemeläinen²

¹MTT Agrifood Research Finland, Plant Production Research, Alapääntie 104, FI-61400 Ylistaro, Finland. markku.niskanen@mtt.fi

²MTT Agrifood Research Finland, Plant Production Research, Building E, FI-31600, Jokioinen, Finland. oiva.niemelainen@mtt.fi

Abstract

Effect of sowing density on seed yield and quality of Westerwold ryegrass (*Lolium multiflorum ssp. westerwoldicum*) was investigated at MTT Agrifood Research Finland at Ylistaro research station (latitude N 62°57') in 2005-2008. Completely randomized block experiment with four replicates had five sowing density treatments: 200, 300, 500, 700 and 900 germinating seeds /m². Sowing rate ranged from 8.4 to 37.8 kg ha⁻¹ depending on germination and seed size of the used seed lot. Cultivar 'Pollanum' was used in the experiment. The experiments were on loam soil. Nitrogen was applied at 80 kg ha⁻¹ prior to sowing. The trial was sown by Oyjord plot experiment sowing machine. The whole experiment was direct combine harvested at same date by Wintersteiger Plot Harvester. Plot size was 13,75 m². Objective of the study was to clarify how sowing density would affect evenness of maturity and seed yield. Previous studies have indicated that uneven maturity is the biggest problem in seed production of annual ryegrass in Finnish conditions. Late tillering in sparse stands has been one factor causing uneven maturity. Green tillers at harvest make harvesting difficult and can risk the quality of harvested seed. The average seed yield in this trial was 1264, 1247, 499 and 739 kg ha⁻¹ in 2005, 2006, 2007 and 2008, respectively. Increasing sowing density increased number of fertile tillers and seed yield, and reduced seed moisture content at harvest. Effect of sowing density on thousand seed weight and on germination was positive, although weak. On average the seed yield was 23 % lower at sowing densities 200 and 300 seed /m² in 2005-2008 than at the higher sowing densities. Seed yield at sowing density treatments (500, 700, 900 seed/m²) did not differ of each other. On average the number of fertile tillers decreased from 1120 to 790 ears /m² when sowing density decreased from 900 to 200 seeds /m². Average seed moisture content at harvest decreased from 48,2 percent to 42,1 percent at sowing densities 200 and 900 seeds/m², respectively, indicating more even maturation at the higher sowing density treatments.

Key words: westerwold ryegrass, seed yield, sowing density, seed quality