
Seeding Rates

Usukh, B. 2010. The impact of lentil and field pea seeding rates on dinitrogen fixation and subsequent nitrogen benefits in an organic cropping system. M.Sc. thesis, Department of Soil Science, University of Saskatchewan.

There is a demand for new recommendations for pulse seeding rates that will meet the needs of organic farmers. This study was conducted to determine the impact of seeding rate on N₂ fixation and N accumulation in lentil and pea and to examine the impact of different seeding rates of lentil and pea on the productivity and N-uptake (i.e., N benefit) in a subsequent wheat crop.

The study was performed between 2005 and 2007. Two sites were selected each year of the two-year experiment on certified organic farms in central Saskatchewan. At each location, lentil (*Lens culinaris* L.) cultivar CDC Sovereign and field pea (*Pisum sativum* L.) cultivar CDC Mozart were each seeded at five different rates. Wheat (*Triticum aestivum* L.) cultivar AC Elsa was sown as a non-fixing reference crop at a plant population density of 250 seeds m⁻². In the following year, wheat was sown to assess the effect of the pulse seeding rate treatments on the succeeding crop.

The pulse crop seeding rates significantly affected the quantity of N₂ fixed of lentil and field pea, although %Ndfa (80 to 88% and 79 to 85% for lentil and pea, respectively) typically was unaffected by seeding rate. Yield parameters of following wheat crop were not affected by the seeding rates of the previous pulses. Typically, N contributions increased with increasing seeding rates of both lentil and pea, but there was no detectable difference in N uptake by the following wheat grown on the both pulse stubble. The different seeding rates of organically grown lentil and field pea have impacts on the amount of N₂ fixed and N contribution to the soil. However, the differences in N remaining in the soil at different seeding rates of the pulse crops were not detectable in the following wheat crop and the soil N in the following year.

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