

## Cluster 2 – Progress Report for the Cluster 2 Science Advisory Body

### 1. CLUSTER PROJECT DETAILS

**Project number:** A11

**Name of Project:** Effect of Seeding Rate and Seed Size on Lentil Diseases, Weeds, Yields, and Profitability

**Project research period:** 2013-16

**Period covered by this report:** 2015-16

**Principal investigator and research collaborators:** Dr. Steven Shirtliffe

### NON-CONFIDENTIAL ABSTRACT/SUMMARY

The issue of optimum seeding rate in lentil is difficult as the seeding rate interacts with crop physiology, weed control, disease, and finally yields. Research is being conducted at multiple locations in Saskatchewan over four years to develop seeding rate recommendations for different seed size classes of lentils that take into account plant diseases, lodging, competition, yield, and economic return. The research is divided into three experiments. The first experiment evaluates disease control methods in combination with seeding rate in three different lentil seed size classes to determine the impact on plant diseases and yield. The second experiment aims to refine the seeding rate recommendations for six classes of lentils under one fungicide regime that attempts to control plant diseases. Finally, the third experiment is looking at the combined effect of seeding rate and row spacing on seed yield and plant disease in three seed classes of lentils. The experiments use dominant varieties within each seed class (extra small red, CDC Imperial, TSW 34; small red, CDC Maxim, TSW 40; large red, CDC KR-1, TSW 56; small green, CDC Invincible, TSW 34; medium green, CDC Imigreen, TSW 57; and large green, CDC 3339-3, TSW 56), common fungicide regimes (None, Headline sprayed once, Headline and Bravo (two separate applications), and Fracture (new biofungicide applied at recommended application rate and timing)), and a wide range of seeding rates (60-320 seeds/m<sup>2</sup>). Disease control experiments so far show that applying fungicide did not increase lentil yield nor change the ideal seeding rate. However, in a wet year a small increase in anthracnose severity, from 22% to 30%, was seen when a high seeding rate (240 plants/m<sup>2</sup>) was used. Both the seeding rate refining experiment and the row spacing experiment are showing that lentils should be grown at higher seeding rates than the current recommendation of 120 seeds/m<sup>2</sup>. The highest yields were seen with seeding rates of approximately 200 seeds/m<sup>2</sup> for most classes. There is some evidence that small red lentils may require even higher rates than 200 seeds/m<sup>2</sup> for optimum yield. Lentil yield was highest with 10-20 cm row spacing and decreased as row width increased to 30 and 40 cm, regardless of what seeding rate was used. This study gives mounting evidence that seeding rates should be raised and narrow row spacings used, to optimize lentil yield.