

This project was intended to provide producers with information on the most profitable combinations of seeding rates and foliar fungicide application strategies for lentils under a range of Saskatchewan growing conditions. Field trials with small red lentils were conducted at three locations (Swift Current – Brown Soil Zone; Scott – Dark Brown Soil Zone; Indian Head – thin Black Soil Zone) in 2021 and 2022. The treatments were a factorial combination of three seeding rates (130, 190, and 250 seeds/m²) and three fungicide management treatments (no fungicide applied, single application at early flowering, single application at early flowering and a second application approximately 14 days after the first). The fungicide products and rates were 395 ml/ha Dyax (250 g/l fluxapyroxad and 250 g/l pyraclostrobin) for the first application and 420 g/ha Lance WDG (70% boscalid) for the second. Data from Scott 2021 were removed due to extreme variability caused by drought and poor environmental conditions.

Establishment varied with environment and the highest populations were achieved at IH-22 and SC-22 (176 plants/m² on average) and densities were lower at the remaining three sites (139-142 plants/m²). Seedling mortality increased with the seeding rate from 11% at 130 seeds/m² to 23% at 250 seeds/m². Yields were positively correlated with seeding at 1/5 sites (IH-21), not affected at 2/5 sites (SW-21 and SC-22), and negatively affected at 2/5 sites (IH-22 and SW-22), and when averaged across sites (Figure 1). The contrasting results at Indian Head may have been due to poorer overall establishment in 2021 and much wetter conditions in 2022. The magnitude of the yield response was small at the affected sites; however, with higher input costs and similar or lower yields, increasing seeding rates from 130 seeds/m² to 190 seeds/m² reduced profits at 3/5 sites. Rates of 250 seeds/m² were less profitable than 130 seeds/m² at 4/5 sites.

There was an overall benefit to applying fungicide at early bloom, but not to following up with a second application,

under the conditions encountered during this project. With generally low disease pressure, however, the yield responses to fungicides were small, averaging only 3-4% at the most responsive sites and 2.5% across all five sites. The observed yield benefits to a single fungicide application were sufficient to cover the costs of the products and application at 2/5 sites, but did not increase profits. At 3/5 sites and when averaged across sites, relative profits were lower with a single fungicide application than in control. The dual fungicide application was always less profitable than the control.

In conclusion, seeding rates of 130-190 seeds/m² should generally be relatively low risk and considered optimal. If low mortality is expected and/or there is a risk of either extreme drought or wet conditions, the lower of these rates may be preferable. If seeding conditions are poor (i.e., high mortality is expected), weed pressure is high, or general weather conditions are more 'average', moving to the higher end of the 130-190 seeds/m² range may be beneficial. With relatively weak responses to fungicide, our results support the recommendation to scout for disease and base management decisions on the actual disease pressure and weather conditions.

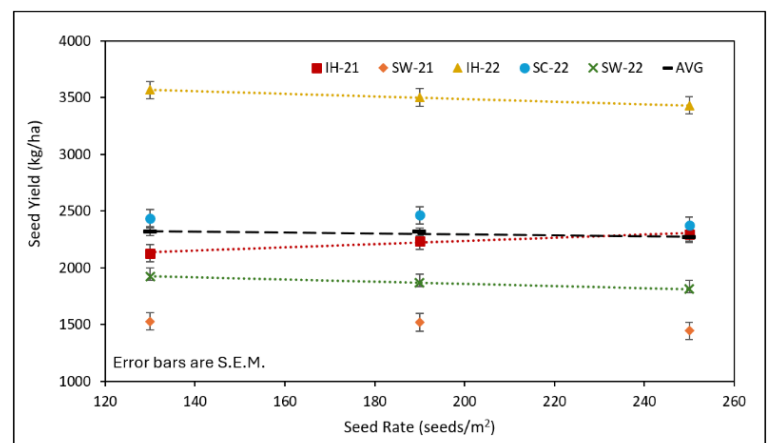


Figure 1. Seeding rate effects on lentil seed yield at Indian Head (2021 and 2022), Scott (2022), Swift Current (2021 and 2022), and averaged across all five sites.

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