Factsheet: Lentil Input Study

Objective:

- To determine which combination of the common agronomic practices will produce the greatest lentil yield
- To determine which agronomic practices will provide the best economic return to producers

Methodology:

The study was conducted over three years (2017, 2018, 2019) throughout Saskatchewan at Scott, Indian Head, Outlook, Swift Current, and Yorkton in 2017, then in 2018 and 2019 at the University of Saskatchewan in Saskatoon. Treatments consisted of three seeding rates (130, 190, and 260 seeds/m2), three fungicide treatments (unsprayed, single, and dual application) and two herbicide management practices (pre-seed burn-off vs. pre-seed residual) for a total of 18 individual input combinations.

Key Findings:

- A pre-seed residual herbicide reduced early season annual weed populations by 66% compared to the traditional pre-seed burn-off strategy.
- The least effective weed control strategy was utilizing the current seeding rate recommendation of 130 seeds/m^2 with glyphosate applied alone (Figure 1). The most effective weed management strategy utilized a seeding rate of 190 seeds/m^2 combined with a residual herbicide to reduce weed biomass by 76%.
- Disease severity tended to increase with seeding rate (260 seeds/m^2 > 190 seeds/m^2 > 130 seeds/m^2) (Figure 2). At 190 seeds/m^2, disease levels were similar to lentils unsprayed at the current seeding rate recommendation (130 seeds/m^2). A single fungicide application is required when a seeding rate targets 190 seeds/m^2, dual fungicide applications may be required under higher disease pressure.
- A seeding rate of 190 seeds/m^2 resulted in the highest yield compared to seeding rates of 130 and 260 seeds/m^2.
- A seeding rate of 190 seeds/m^2 also resulted in higher net returns than 130 and 260 seeds/m^2, regardless of management strategy. The highest net returns occurred with a seeding rate of 190 seeds/m^2, no fungicide and a residual herbicide application.
- The cost of a fungicide typically reduced net returns compared to the unsprayed. However, the fungicides should be viewed as a form of insurance rather than an input cost, as disease management is essential for proper lentil production. Additionally, the experiments in the 15 site-years were generally conducted under drought conditions with limited disease pressure and therefore may not show the economic benefits that might be associated with fungicide applications under a wider range of conditions.

The full report is available at: www.warc.ca. This project was jointly funded through the Canada-Saskatchewan ADF program (administered by the Saskatchewan Ministry of Agriculture), Saskatchewan Pulse Growers and Western Grains Research Foundation.

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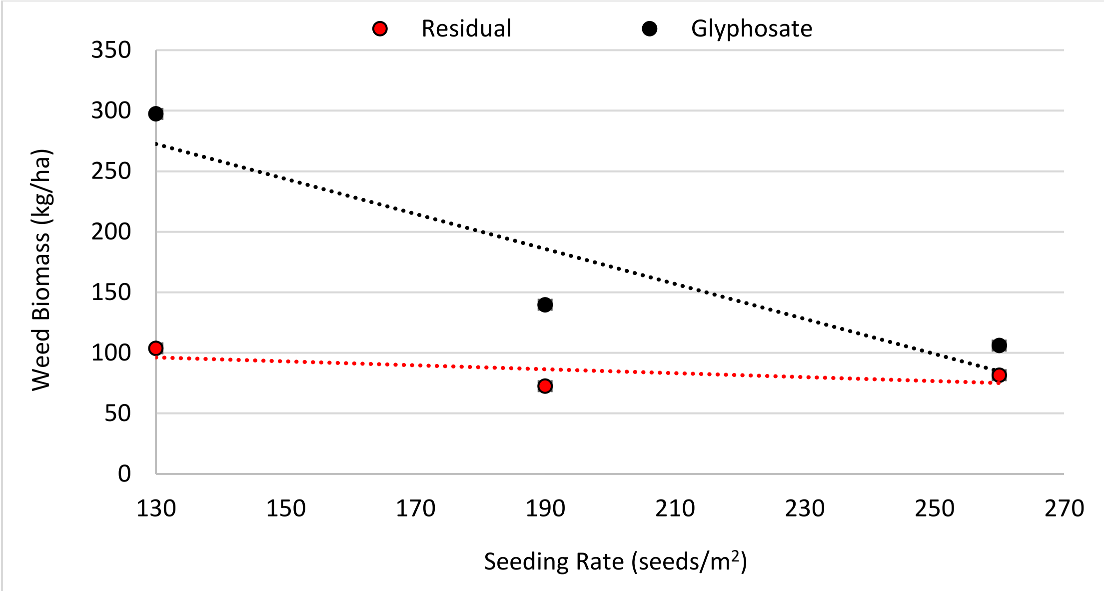

Figure 1. Effect of seeding rate and herbicide applications on weed biomass at physiological maturity. Points represent 11 responsive site years. Line equation for the glyphosate applied alone: y= -1.445x +460.32; R^2= 0.8469. Line equation for the residual herbicide is y= -0.1627 x + 117.41; R^2= 0.4324

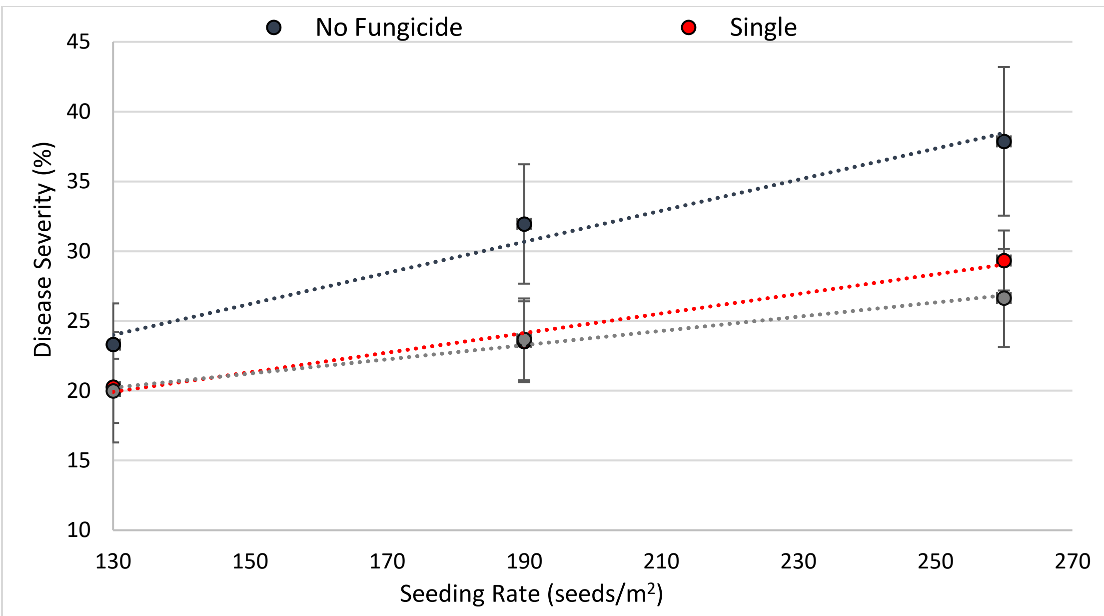

Figure 2. Effect of lentil seeding rate on disease severity ratings (0-100%) at 21 days after initial application (DAIA) with a significant interaction between a continuous (seeding rate) x categorical (fungicide) interaction (P= 0.0217) at 13 site-years. Standard error bars indicate significant differences between main effects. Line equation for no fungicide: y=0.1113x + 9.5247; R^2 = 0.9771. Line equation for single fungicide: y = 0.0702x + 10.793; R^2 = 0.9863. Line equation for dual fungicide: y = 0.0509x + 13.594; R^2 = 0.9885.

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