

## A Comparison of Aerial and Ground Application of Fungicides in Chickpeas

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### Abstract

Ascochyta blight (caused by *Ascochyta rabiei*) requires application of fungicide by air or ground. The relative performance of these application methods is unknown. Objectives of this study were to compare aerial and ground fungicide application on chickpea disease and seed yield. Chickpeas (certified CDC Xena, a unifoliolate kabuli rated as having very poor ascochyta resistance) were established on a site near Saskatoon, and each of three treatments were established in each half: untreated check, aerial, and ground application. The aerial treatment consisted of four adjacent 50' passes and the ground application was five 43' passes per replicate. Headline (pyraclostrobin) was applied on July 11 and 21 at 0.4 L/ha, followed by Lance (boscalid) on August 1 and 13-14 at 0.42 kg/ha. Aerial and ground applications were conducted at dusk with calm conditions. Aerial applications were done by Cessna Ag Truck applying 4 US gpa through 24 CP-03 nozzles with the 0.125 flow orifice and 90° deflection, at a pressure of 34 psi and 120 mph airspeed. At these settings, the spray had a volume median diameter (VMD) of 271 µm according to USDA atomization models. Swath width was 50' and boom height was 10 to 15' above ground. Ground applications were done using a Melroe SpraCoupe 220 travelling 8 mph with a 43' boom, using XR8003 nozzles operated at 40 psi and a boom height of about 75 cm. At these settings, the application volume was 100 L/ha, and the spray had a VMD of 246 µm. The crop was harvested on September 3. In the aerial plots, the central two spray swaths of each rep were sampled. In the ground plots, two swaths were taken with wheel tracks, and two without wheel tracks in each rep. Wheel tracks were then adjusted to a 90' boom width for yield calculations. Disease severity in the untreated chickpea progressed from about 5% to about 66% from July 9 to July 31. Disease severity in sprayed plots was significantly less, about 18 and 21% for the ground and aerial treatments, respectively on July 31. A late flush of disease on new growth increased levels to 87% in the untreated plots, and 28 to 41% in the ground and aerial plots, respectively, on August 14. Fungicide application significantly increased seed yield. Yield averaged 13 bu/acre for the unsprayed treatments, and 33 bu/acre where fungicide had been applied. Aerial treatments yielded 32.7 bu/acre, whereas ground treatments (track damage adjusted for 90' boom width) yielded 34.4 bu/acre. This difference was not statistically significant. Ground-sprayed areas without wheel tracks yielded 36.0 bu/acre, therefore yield loss due to tracks was 1.6 bu/acre. Sprayer tracks reduced yield due to crop destruction, but they did not appear to spread disease within the crop. It is possible that application during evening hours before dew wetted the foliage helped prevent disease spread. The role of sprayer tracks requires further investigation. These results showed that both ground and aerial application of fungicide provided effective control of *Ascochyta rabiei* on chickpeas. These are only a single year's results and further work is necessary to confirm this outcome, but there appears to be support for recommending both methods to producers wishing to apply fungicide.

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