Comparison of Desiccant Timing and Harvest Method in Canola
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Introduction
The concept of straight combining canola is gaining favor among growers in North Dakota. Some growers have indicated they would increase canola acres if they could eliminate swathing, which is very time consuming and leaves the crop susceptible to strong winds.

However, under cool, wet conditions straight combining may not be advisable without the assistance of a desiccant to help dry down the crop. In 2005, a Section 18 emergency exemption was approved to use Reglone as a pre-harvest desiccant. However, essentially no Reglone was used due to cost, lack of information, and experience with applying a desiccant followed by straight combining. This experience is what prompted this study.

Thus, there are questions to be answered regarding proper desiccant use. For example, what is the proper canola stage for application? How many days must one wait to harvest? Will a desiccant increase shattering potential or pod drop? Does application timing or harvest date affect green seed count, yield, test weight, oil content, or grade compared to swathing?

Research Objectives
• Determine the effect of Gramoxone and Reglone applied pre-harvest at three timings on canola yield, seed moisture, and seed quality.
• Compare Gramoxone and Reglone-treated canola to swathed canola.
• Determine the effect of harvest timing following a Gramoxone or Reglone application on canola yield, seed moisture, and seed quality.

Materials and Methods
This study was conducted at Minot and Langdon, ND and Bozeman, MT in 2005, 2006, and 2007. Only the ND data will be presented here. Gramoxone (paraquat) and Reglone (diquat) were applied at 1.3 psi with NIS at 0.25% v/v. Reglone was applied at 1.5 psi with NIS at 0.25% v/v.

One treatment was swathed with a plot swather on the same day the Gramoxone and Reglone treatments were applied as a comparison to current grower practices. The Gramoxone, Reglone, and desiccant treatments were harvested 7 and 14 days after treatment (DAT).

Figures 1, 2, and 3 show the approximate canola stages that desiccants were applied in Langdon, ND. Each picture shows, from left to right, open pods from the top-, middle-, and bottom-third of canola plants for each application timing. For example, on August 5, seed in the bottom-third of the plants are just starting to turn color, while seed in the top- and middle-third of the plants are still green. On August 8, seed in the bottom-third are mostly mature, while the middle-third is just beginning to turn color, and so on. At Minot in 2005, desiccant applications were made slightly later compared to Langdon, as Minot timing 1 would be equivalent to timing 3 in Langdon. At Minot in 2006, the applications stages were similar to Langdon in 2005.

The study evaluated three factors (desiccant, timing, harvest date) and was arranged in a randomized complete block design. Individual plots were 10 by 30 ft with four replications.

Data collected included seed loss due to shattering prior to harvest, canola yield, test weight, seed moisture content at harvest, percent oil content, green date, seed damage, and grade. Four sticky cards (6-inch by 12-inch) were placed under the canopy just prior to or following the desiccant application (Fig. 4). Sticky cards were just collected prior to harvest and seeds were counted and the numbers converted to estimated yield loss per acre. PLOTS were harvested with a plot combine to determine canola yield and test weight. Samples from all locations were analyzed for oil content in Minot, then sent to Archer Daniels Midland, Velva, ND for green count, seed damage, and grade analyses.

Results
Desiccant comparisons:
Gramoxone- and Reglone-treated plots produced similar results to swathing when comparing canola yield and seed quality parameters, with the exception of green seed content. Swathing generally (not always) had lower green content and thus less total damage. Green count was generally lower when 1) plants were not lodged, 2) desiccants were applied when seeds in middle pods had started to turn, and 3) harvest moisture was near 10%.

Timing comparisons:
Desiccant-treated plots generally produced similar canola yield, test weight, and oil content to swathing. However, at Langdon in 2005, swathing or desiccating at timing 1 and 2 resulted in lower yield and test weight. This was likely due to canola being too green with high harvest moisture. In 2006, desiccant applications and swathing were done slightly later and did not affect yield or test weight. As would be expected, green content generally was slightly lower at timing 3 compared to timings 1 and 2. At Minot in 2007, yield was slightly lower for the desiccant treatments compared to swathing, again at the very early application. However, there was no difference in yield at the later timings.

Harvest date comparison:
There was minimal seed loss due to shattering at either harvest date at either location, generally less than 50 lb/acre. At Minot and Langdon, both desiccated and swathed canola harvested 14 DAT had lower green count and less total damage than canola harvested 7 DAT. Thus, leaving the crop in the field allowed the seeds to continue maturing and drying.

Conclusions:
Based on this three-year study, there may be potential to successfully use a desiccant to desiccate canola without suffering drastic losses due to shattering or lower seed quality. In these studies, if the desiccant or swathing operations were done when seed in the middle pods had started to turn color, crop quality parameters including canola yield, test weight, oil content, seed loss, green count, and grade were generally similar for desiccated treatments compared to swathing. However, the data indicate that very early applications could result in lower yield and seed quality, most specifically higher green content. Regarding efficacy, Gramoxone and Reglone appeared to dry down the crop equally fast.