

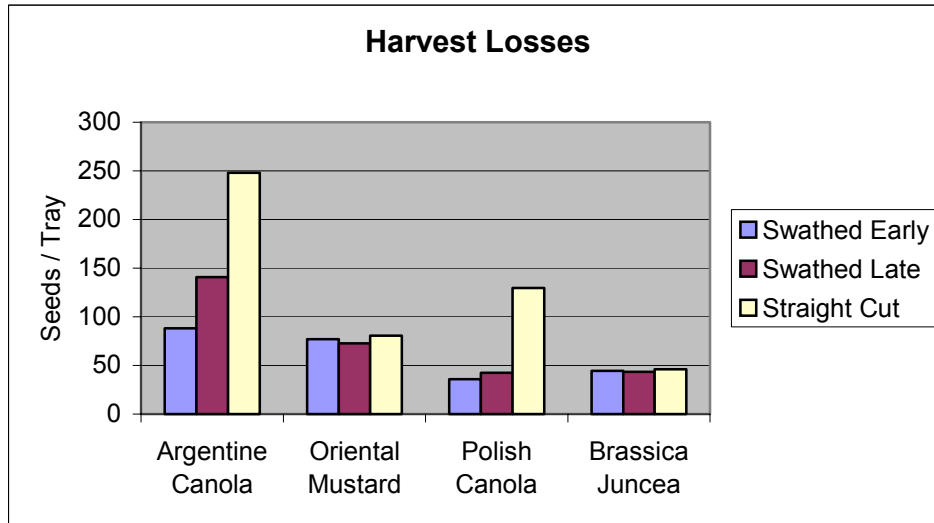
Optimizing Harvestability in Oilseeds

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Oilseed crops have become a major industry in southwest Saskatchewan, however, these crops are not grown without risk. Proper management tools are essential to minimize potential risks and ensure maximum profits for producers. This presentation looks at two management components. The first being an agronomic timing component, comparing early and late swathing verses straight cutting and the second being an ag-engineering component that studies various headers used to straight cut oilseed crops. Both studies were sponsored by the Saskatchewan Canola Development Commission.

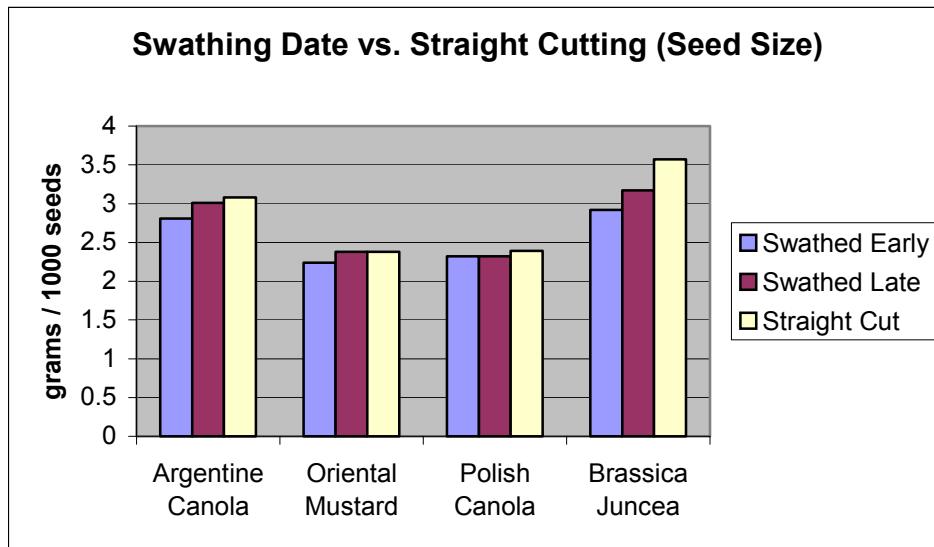
The first project studies common mechanical harvesting techniques and timing to determine the most effective way to harvest Brassica juncea, Argentine canola, Polish canola, and Oriental mustard. Variables included swathing early (20-30% colour change), swathing late (60-70% colour change), and strait cutting to determine which operation produces the highest yield and highest quality seed. Swathing date was examined to determine the proper physiological growth stage for swathing. Overall, harvest losses were lowest when swathed early, and highest when straight cut. In some cases, these were relatively low and did not translate into significant yield reductions.

Chart 1. Harvest losses in Oilseed Crops at Swift Current 2005



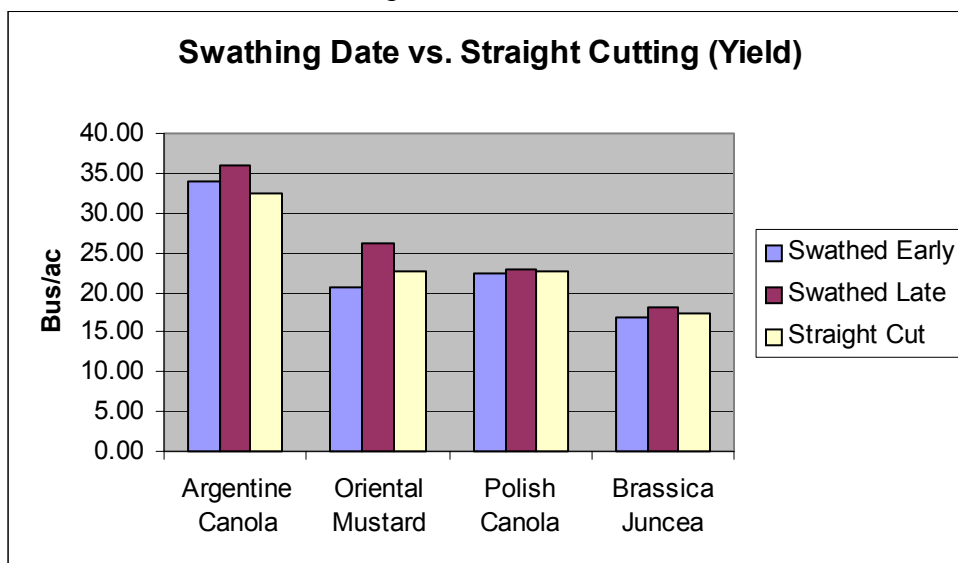
Seed size appeared to have had a greater impact on yield. The early swathed treatments, despite having fewer harvest losses, had consistently lower seed weights than the other treatments, which had a negative impact on yield in all crops studied. Early swathing may have resulted in excessive seed shrivelling and therefore should have been avoided.

Chart 2. Seed Size in Oilseed Crops at Swift Current 2005



Yields from crops that were swathed late and straight cut varied depending on the crop. In this instance, it came down to a trade off between the negative yield effects due to harvest losses, and the positive yield effects as a result of increased seed size. In Argentine canola and Oriental mustard the harvest losses were high and out weighed the positive effects of seed size. Therefore, yield benefits occurred when they were swathed late. On the other hand, there was no significant yield difference in either Polish canola or juncea when straight cut or swathed late making straight cutting these crops a viable option.

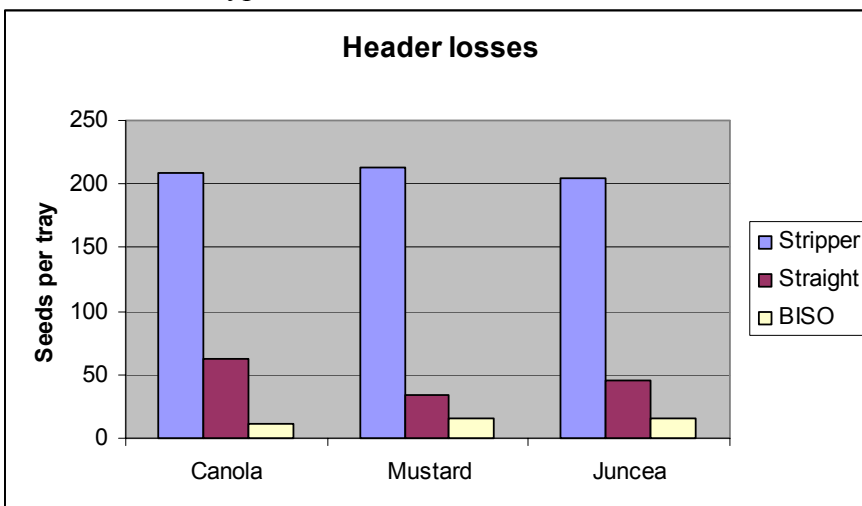
Chart 3. Yields in Oilseed crops at Swift Current 2005



If feasible, producers would prefer to straight cut their oilseed crops. Eliminating the swathing operation saves time at harvest or eliminates the need for a custom swathing operation. As we have seen from the study mentioned above, straight cutting some oilseed crops can result in excessive harvest losses, therefore, other harvesting methods are required. The second study is in its first year looking at straight cutting Brassica juncea, Argentine canola, and Oriental mustard using three different headers to determine losses and yield. The headers studied in this trial were a rigid straight cut header, a stripper header, and a BISO header extension. Stripper headers have been around for a number of years, however, they are relatively new to Saskatchewan and their potential has not been fully studied in crops like Brassica juncea and mustard. Stripper headers use a series of fingers mounted on a rotating octagonal drum to strip off the heads or pods and leave much of the remaining plant material standing. A very limited amount of work has been done with stripper headers in pulse crops with promising results. On the other hand, header extensions are new and little work has been done in the province regarding losses and efficiencies. Header extensions move the cutter bar forward about 18 inches on a stepped platform to reduce cutter bar losses. More and more producers are looking at alternative headers for speed, efficiency, and ease of operation, however, producers are reluctant to commit a large capital item for one type of crop. Collaborating with Mark Stumborg (SPARC) and Mr. Robert Breckner (BISO header extension), this project studied the stripper header, straight cut rigid header, and the BISO header extension in Brassica juncea, Oriental Mustard and Polish Canola and looked at information on harvest losses, and yield.

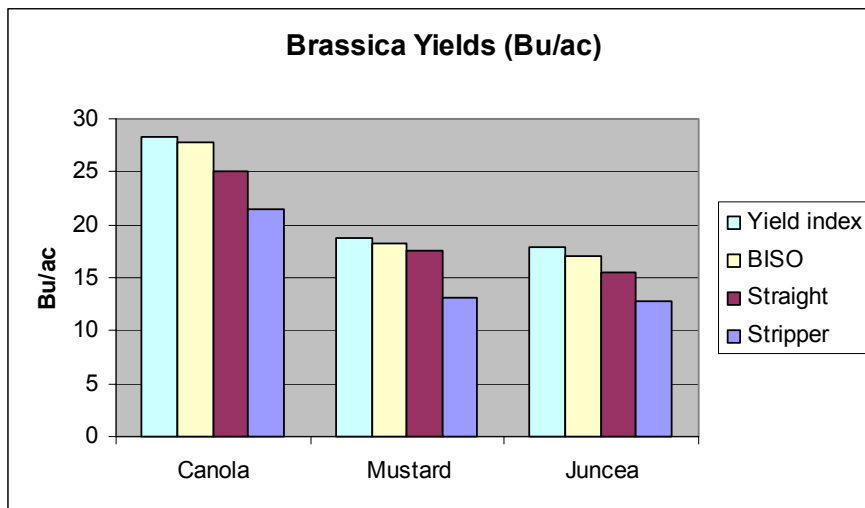
Header losses were high in the canola, mustard, and juncea when the stripper header was used and lowest when the BISO extended header was used. The ridged straight cut header had higher losses than the BISO header, however, not near as much as the stripper header. The differences were most evident in the Argentine canola, followed by the juncea, then the Oriental mustard.

Chart 4. Header Type and Losses in Oilseeds at Swift Current 2005



These losses may appear to be high, however, how does this translate into yield? Header losses did reflect the yield differences, however, not to the same extent. The following chart looks at yields from each header in each crop and compares them to a yield index taken from square meter samples in each crop.

Chart 5. Header Type and Yields in Oilseeds at Swift Current 2005



We determined early that the stripper header was not a viable harvesting tool in canola, mustard, and juncea even though other studies indicate it has the potential to be a premium header in cereals, flax, and lentils. It was thought that seed size played a large role in the effectiveness of the stripper header, however, some large seeded crops like peas appear to have high losses when harvested with the stripper header as well. It was determined that losses caused by the stripper header had more to do with the proximity of the seed on the plant. Crops like canola and peas, where the seed is distributed along the length of the plant, appear to have higher losses than crops like cereals and flax, where the seed is located in a tighter region on the plant. In crops like canola, the rotor of the stripper header is stripping the pods from the bottom of the plant while vigorously shaking the pods at the top of the plant. This is likely when the majority of the losses occur. Header losses were low with the header extension. Header extensions move the cutter bar forward about 18 inches on a stepped platform to reduce cutter bar losses. With the reel set back 18 inches from the cutter bar, mechanical shattering is caught by the stepped platform and not lost. Since crops like canola branch out from the main stem, crop feeding is not an issue, even though the reel is set back from the cutter bar. In 2005, when the header extension was used, we saw a yield increase of 2.6 bushels per acre in Argentine canola, 1.6 bushels per acre in Brassica juncea, and 0.7 bushels per acre in Oriental mustard compared to yields from the rigid straight cut header. This translates into a 9.4% increase in canola and juncea, and a 3.9% increase in mustard.

In 2005, we experienced a hot dry July and even though the crop stand looked good the overall yields were average at best due to poor pod development. We can look at losses as a percent of the index yield and may be able to extrapolate and estimate losses in bushels per acre on any yield. It is yet to be seen if this can be done accurately. We will continue this study and possibly substitute the stripper header with a draper style header. Good Luck in 2006.