Final Report

Field Survey of alternative seeding methods of canola under extreme wet weather conditions in Southeast Saskatchewan, 2011.

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Introduction

Southeast Saskatchewan received a large accumulation of both snow and rainfall prior and during the seeding season of 2011. This caused crop damage and a large drop in seeded acres. The majority of acres in the extreme southeast of Saskatchewan in the areas around Redvers were not seeded before late June. It also caused severe damage to many roads, which limited access to many fields for seeding and spraying.

Based on Saskatchewan Ministry of Agriculture maps of soil moisture levels in cropland, Crop Districts 1A and 1B were in a surplus situation on average continuously from April until mid-July. At the beginning of July, crop districts 1A and 1B were reporting 66 and 83 per cent surplus crop land topsoil moisture, respectively. Table 1 shows seeded acres based on Saskatchewan Ministry of Agriculture crop reporter data.

Table 1. Seeded acres for southeast Saskatchewan.

SE Region Crop District	% seeded (June 20, 2011)
1A	33
1B	17
2A	43
2B	66
3ASE	57
Region Average	44

Producers attempted to seed some fields, and canola was sometimes their only grain crop seeded in May and June. Those who could obtain a method of broadcast seeding were able to cover more acres under wetter conditions than those with airseeders. Producers also reported that when they were able to take packers off their seed drills, they could also get through the wet fields more easily. Many acres remained unseeded and these produced rank growth of reeds, dock, and other water loving weeds. Many fields were cultivated in their entirety in June, July and August, and most were cultivated in areas around sloughs and water runs.

Methods

A total of 32 producer fields were surveyed between August 3 and August 31 in the extreme southeast area of Saskatchewan. These were in the Moosomin, Maryfield, Redvers and Carnduff areas. These fields were seeded either with a traditional airseeder, with a broadcast seed applicator like a Valmar, or by air with an airplane or helicopter. Sixteen fields were broadcast seeded using various methods. Generally a Valmar was used alone or in combination with a harrowing implement. All but one of the broadcast fields were harrowed during or subsequent to seeding. This unharrowed field was similar to the other broadcast fields in establishment, and was grouped for analysis with the rest.

The survey is not meant to determine the relative proportions of fields seeded with drills and broadcast, as the method of surveying sought to find fields that were seeded using unusual means. However, it does represent an attempt at random sampling of producer practices from various water-affected areas in Crop Districts 1A and 1B. A total of 32 fields were surveyed throughout the month of August, 2011 for establishment. Quarter meter square plant counts were taken at 6 locations in each field by summer student Marc Poirier. Producers also gave information about their seeding date and methods, fertilization and other field operations. Producer-reported yields were collected in October following harvest. The producers were asked to give their best estimate of yield. The results were grouped into the three main classes of seeding method for a comparison of establishment and outcome. These are presented graphically and also summarized in Table 2.

Results

There were no conventionally-seeded canola fields planted after May 25 due to excessive moisture. Only two were seeded between May 20th and 25th by conventional means. There were, however, 14 fields seeded by broadcasting after the 20th of May when fields were starting to become too wet to be trafficable. Producers were able to pull the much lighter broadcast and harrowing equipment through wet ground without `mucking`it into saturated soil. With dry, hot weather in July, crop health improved and development advanced. Average yields for these fields was somewhat lower than the average reported for the entire southeast region (Table 2).

There were only three fields seeded by airplane in this survey. Two of these turned out to have higher than average yield, while the third was limited mainly by weed control and lack of fertilizer. Aerial seeding was possible even when the fields were completely untrafficable, and under extended very wet conditions, may be warranted.

Almost all fields received a fertilizer application. Various methods were used: fall anhydrous application, spring airseeder application, spring broadcast application, and spring liquid sprayer application. Applied nitrogen fertilizer rates were 45 to 110 lb N/ac, with lower rates generally being post-emergent liquid applications. Nitrogen fertilizer amount was not apparently a limiting factor for yield within the range of fertilizer rates surveyed. In two fields, the producer said that the delay in application of liquid fertilizer was an agronomic limitation.

While three volunteer fields were surveyed, the results from these fields were very poor in appearance and yield, despite comparable average plant counts. Data from these three fields is not included in the following analysis.

Table 2. Summary of Results.

	n=	**Average Seeding Date**	**Average Plants/m^2**	**Average Yield (bu/ac)**
Aerial Application	3	June 4	107	19.8
Airseeder	10	May 18	90	21.6
Broadcast / harrow	16	May 28	99	18.1
Survey Average		May 24	97	19.5
SE Region Average	*(Saskatchewan Ministry of Agriculture Final Crop Report 2011)*			*23*

Figure 1.

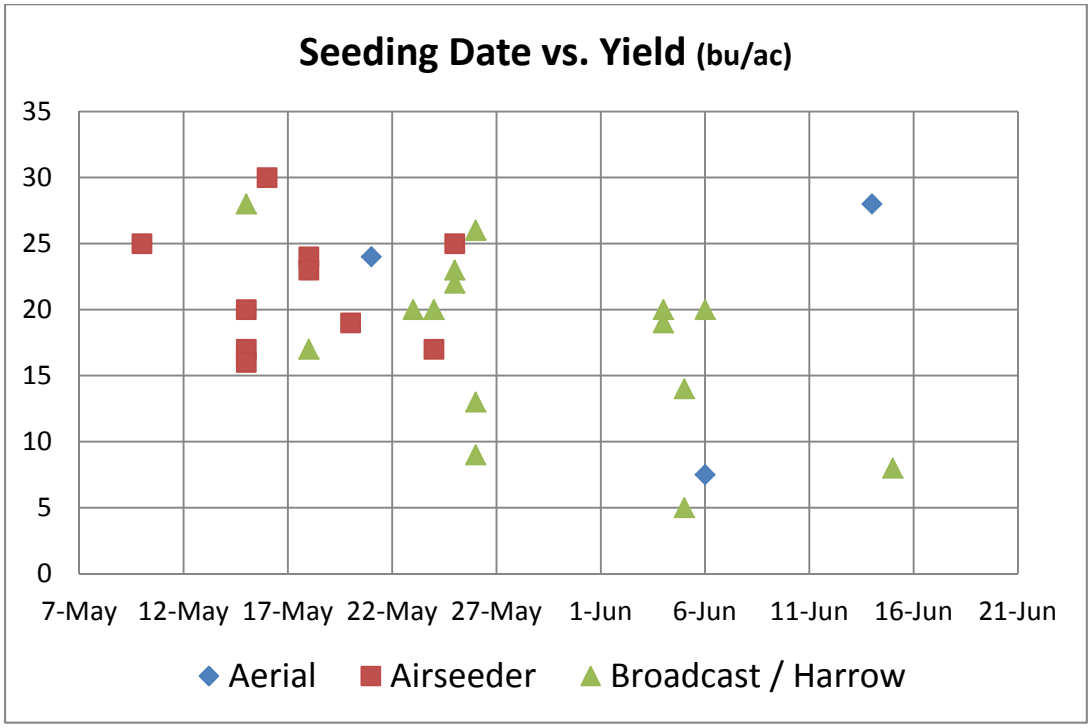
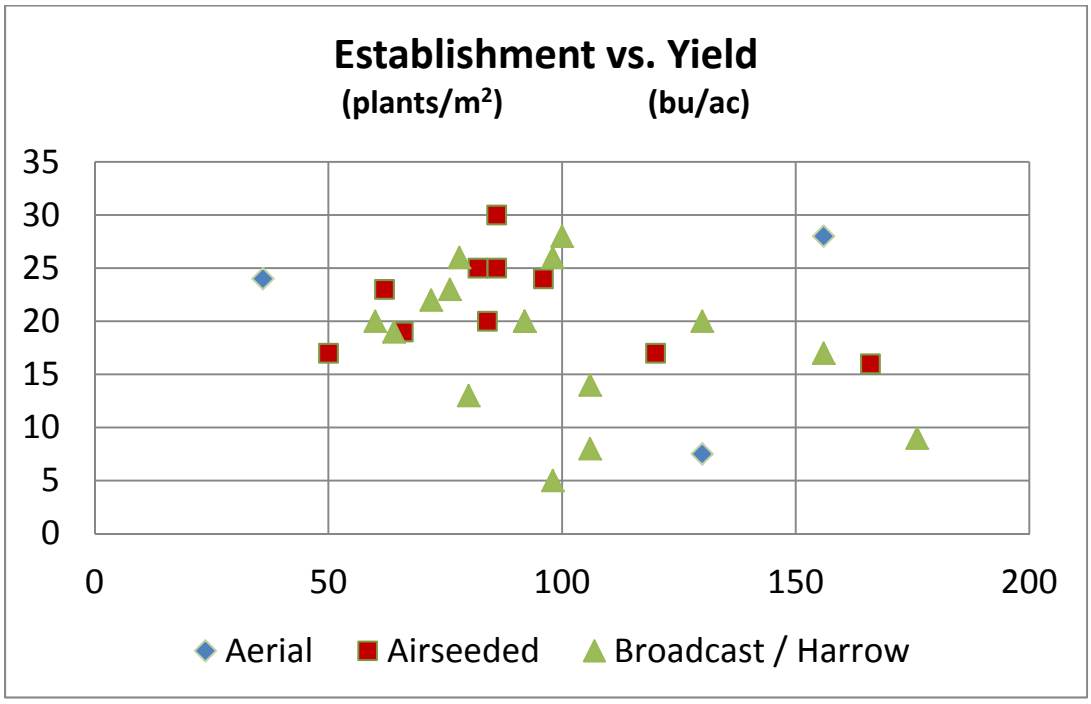


Figure 2.



Yields of broadcast and aerial seeded fields were comparable to airseeded fields under these extreme conditions, particularly when delayed seeding dates are taken into account. With a large percentage of unseeded acres in the Moosomin – Redvers – Carnduff areas in 2011, agronomic recommendations that promote seeding wet acres to canola will help to mitigate the effects of excessive moisture on affected regions.

Most canola fields were sprayed once or twice with a post-emergence product like glyphosate or Liberty. Because of the poor growing conditions and excessive moisture, weed competition and control was an important issue for all fields. Weed control was difficult due to field access problems due to washed out roads. Most unseeded fields in the survey area had to be cultivated more than once and sprayed multiple times to break down rank growth of curly dock and water weeds. These fallow fields are at risk for wind and water erosion before plant cover can be re-established in 2012.

Seeding rates for air drilled and broadcast fields were within a typical range (4 lb/ac to 5 lb/ac) and were similar between the two groups. However, the two successful aerial seeded fields had seeding rates of 6.5 lb/ac, which helps to explain why they were successful when seed to soil contact was questionable.

Crops seeded in May and early June experienced low temperatures, waterloogged soils, and periods of standing water. Signs of plant stress such as purpling were common during June. High temperatures during July generally reduced yield potential across all fields, but did dry up fields and allow the crop to progress rapidly. We were surprised to see as many good looking canola fields in late July as we did, given how poor they looked at the end of June.

Some producers seeded much of their unseeded acreage to oats or millet to produce greenfeed. This is a good option for those that have cattle, but in very wet years, the availability of forage is generally good and this forage may not be needed. Canola is generally better for cash-flow and particularly popular when prices are high, as they were in 2011.

Conclusions

- Canola plants recovered from flooding and produced a respectable crop even under extremely adverse conditions. Producers used it to de-water fields and establish cover. Producers should consider broadcasting and harrowing canola seed when excessive spring moisture is delaying seeding.
- Alternative seeding methods give producers the choice of whether or not to seed under very wet conditions. The choice they make will depend on many considerations. However, weed growth and time dedicated to maintaining fallow fields in a extreme wet year is different than in a normal year, and this should be given due consideration.
- Under very difficult spring conditions, yield potential is generally lower, and expectations for the crop should also be lowered. Accordingly, the amount of fertilizer used should reflect the reduced yield potential of the crop with late planting.
- Adaptation to and mitigation of extreme weather cycles is crucial for sustainability of agriculture. When large regions are affected, unseeded acres hurt not only agricultural producers, but also the network of services and industries that are part of agricultural communities. Large unseeded acreage is also a burden on the government agricultural programs that seek to stabilize agriculture in Saskatchewan.

References

Saskatchewan Ministry of Agriculture. Final Crop Report 2011. Oct 13, 2011. http://www.agriculture.gov.sk.ca/crprpt20111108