

Double Cropping Soybeans

(Interim Report)

Purpose:

With early cereal harvests over the past few years, and excellent late season growing conditions, some Ontario soybean producers have started to consider the possibility of growing soybeans after cereals as a double crop. There has been relatively little research conducted in Ontario to determine best management practices for double cropped soybeans. Dry conditions during mid-summer seeding can be a challenge in plant establishment but the biggest difficulty to double cropping soybeans is the risk of an early fall frost, which, if temperatures fall low enough will cause the soybean plant to shut down. If this frost occurs before seeds have been formed in the pods, there is nothing to harvest.

This project was designed to create recommendations for double cropping soybeans after cereals in Ontario.



Figures 1: Planting soybeans into winter barley stubble (left) took place on July 11, 2012 in very dry conditions. The same field (right), on September 23, 2012, made an average yield of 20 bu/ac.

Methods:

In order to provide useful information on double cropping, 3 locations were chosen in 2012. Three seeding rates were used, 100,000, 200,000 and 300,000 seeds per acre, as well as planting at row widths of 7.5" and 15". Each treatment was randomized and replicated three times. Treatment strips at the field scale were 20' wide by 1000' long. Trials were planted with a Kearney 15" vacuum planter with a precision seed monitor. Yields were recorded using a calibrated weigh wagon.

Results:

In 2012, three trials were planted at three locations, two in Perth County near Bornholm, and one in Middlesex County, near Lucan. One site at Bornholm was planted on July 11

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after winter barley, while the other two sites were planted on July 23 and 24 after winter wheat. There was a slight delay at the two later planted sites because of the need to remove straw. As a result, only the site planted early, on July 11, actually made it to yield. The other two sites did not make enough yield to warrant combining due to an early October frost.

At the site that was harvested; Variety A had a CHU rating of 2650, a relative maturity of 0.4, while Variety B had a CHU rating of 2750, a relative maturity of 0.8. Variety B is an adapted variety for the planting area, while Variety A is 100 CHU “shorter” than the adapted variety in the area. Planting date was July 11, harvest date was November 23.



Figure 2: A soybean plant killed by frost (left), the beans were planted July 23 and frost occurred in early October. Soybean seed in the pod was not fully developed at the time of the killing frost (right).

Table 1: Avg. Double Crop Yield at Various Seeding Rates (2012, 1 Site)

Treatment	Yield (bu/ac)	Yield Advantage (bu/ac)
Variety A (100,000 seeds)	18.0	-
Variety A (200,000 seeds)	20.6	2.6
Variety A (300,000 seeds)	23.4	5.4

In the seeding rate study, only Variety A was used. As the results in Table 1 show, by increasing the number of seeds planted yield was increased substantially. This trend

relates well to other seeding rate trials conducted in the past. In this study, by increasing the seeding rate from 100,000 seed per acre to 300,000 seeds per acre, yield was increased by 5.4 bushels per acre.

Table 2: Average Double Crop Yield of Two Varieties at Different Row Widths

Treatment	Yield (bu/ac)	Yield Advantage (bu/ac)
Variety A (250 000 seeds, 7.5" row width)	13.0	-
Variety B (250 000 seeds, 7.5" row width)	12.9	-0.1
Variety A (250 000 seeds, 15" row width)	15.8	2.8
Variety B (250 000 seeds, 15" row width)	15.6	2.6

Table 2 shows that the 15" rows yielded slightly higher than the 7.5" rows. These results are atypical as narrow rows generally yield more when seeding is delayed. The 7.5" rows probably yielded less in this study do to emergence issues with the narrow rows compared to the 15" rows. There was little yield difference between the two varieties, which had a difference of 100 CHU or about 0.4 relative maturity.

Summary:

1. Average double crop yield gains were higher as seeding rates increased. Increasing from 100 000 seeds/acre to 300 000 seeds/acre resulted in a yield increase of 5.4 bushels per acre.
2. There was little yield difference between varieties 100 CHU apart when double cropping in this trial. More variety trials will need to be conducted to assess the best variety choices for double cropping soybeans.

Next Steps:

This was the first year of a three year trial. Next year 3 sites will be planted after winter cereals with an updated experimental protocol. More effort will be placed on timely planting after cereal harvest to try to ensure all sites will have yield data recorded.

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