



## Soy9-2011 - Does Early Planting Along With Late Maturing Varieties

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# Does Early Planting Along With Late Maturing Varieties Increase Yields?

## **Purpose:**

Most Ontario growers choose soybean varieties that will reach maturity based on the projected crop heat units (CHU) for their particular area. This practice is usually combined with planting soybeans in mid-May. One management strategy that consistently leads to higher yields is early planting. Another strategy may be to plant late maturing varieties for a given area. With the introduction of CruiserMaxx seed treatment higher plant populations can often be achieved under more stressful conditions making it possible to plant earlier. This project was conducted to determine if an early planting strategy along with the use of late maturing varieties can increase yield potential in Ontario.

The yield response to 3 soybean varieties was measured at an early planting date (April 15-May 5), a normal planting date (May 6-20) and a late date (May 21-June 5) over the three years of this study (2009-2011). Varieties were chosen over a range of maturities from a full season maturity for that site up to a full season + 400 CHU's maturity.

## **Methods:**

During the three years of this study eight small plot trials were conducted each year in various locations. The trials in 2010 and 2011 were conducted at three sites at public research stations and six were conducted by Monsanto Canada Inc. These trials were located near Seaforth, Chatham, Ridgetown, Elora, Kemptville, Ayr, St. Hugues, and Coteau-du-lac. Plots were seeded using 3 varieties, including 1 variety that was planted with and without CruiserMaxx seed treatment. Each variety was planted on 3 planting dates: one early, one normal, and one late planting. These treatments were replicated at 3 times.

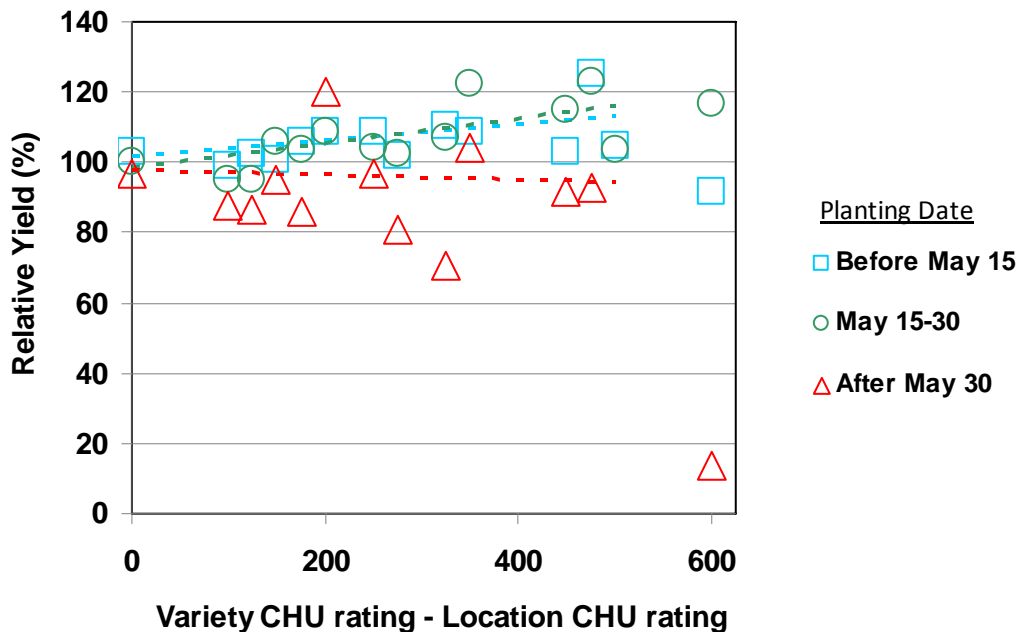
## **Results:**

The three years of the study experienced various types of growing seasons. In 2009 the weather was largely cool and wet, and was combined with an early killing frost in the fall. The 2010 growing season was exceptional; the spring allowed for planting in April under good conditions and the remainder of the season received warm weather and timely rain. The 2011 growing season was unique; the spring was especially wet, resulting in later than normal. Planting was followed by dry weather in July, but the remainder of the season was very good with warm temperatures and consistent rainfall. Although the various weather circumstances caused some problems in establishing trials with consistent planting dates from year to year, and site to site, consistent conclusions could be made from the results of the project.

In 2009 results were mixed. In some locations the adapted or +200 CHU varieties yielded higher than the +400 CHU varieties, this was the result of an early frost, which prevented the longer day varieties from fully maturing. On average the early planting date out-yielded the late planting date, however, in some locations there was no significance to planting date at all.

In 2010 the results were very clear and consistent. There was a significant advantage to planting earlier. Averaged across all the sites there was a 3 bu/ac advantage over a normal planting date, and almost 10 bu/ac compared to a late planting. Due to the exceptional growing season, in almost all cases the latest maturing varieties were the highest yielding soybeans at each location.

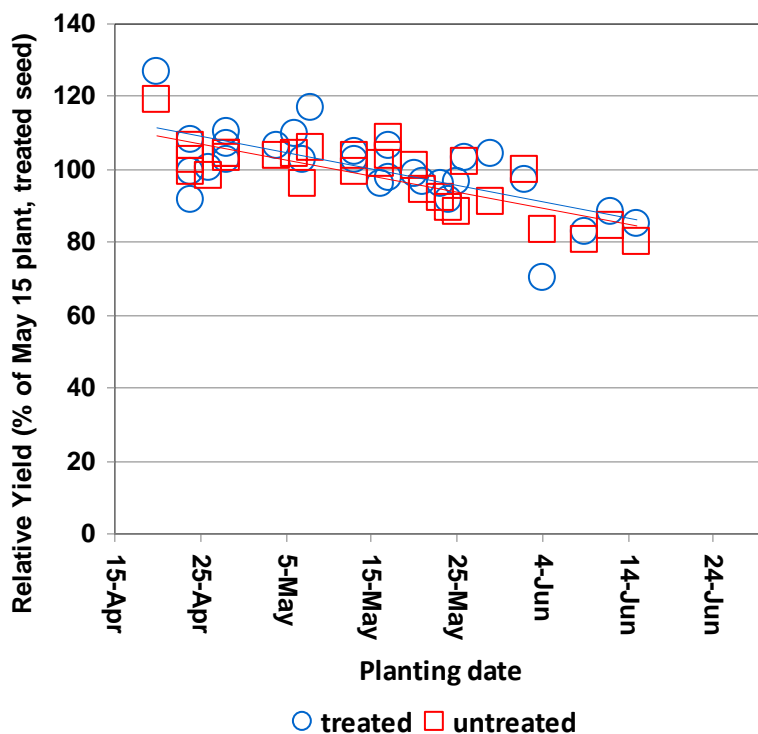
In 2011 the results were affected by late planting conditions in the province. Yield response to planting date varied across varieties and site locations. Generally, the normal planted date and the early date yielded about the same. In some cases adapted varieties that were seeded early suffered a yield loss compared to normal planting. In some cases late planting yielded the highest. The most likely reason for this is the very dry July experienced in 2011, which meant that beans planted at the normal time were trying to set pods when moisture stress occurred. Later planted beans were still vegetative and so were not as adversely affected by this stress.



**Figure 1: Relative Yield Based on Planting Date and Variety CHU Rating (2009-2011)**

Figure 1, above, shows that there is a significant advantage in choosing a variety with a HU rating that is higher than is normally suggested, so long as planting of these varieties takes place in May, as opposed to June. The graph also suggests that the likelihood of a crop failure, or large yield losses, are relatively small when planting takes place in May.

In Figure 2, below, the yield effects of seed treatment and planting date are shown as a percent of expected yield of a May 15<sup>th</sup> planting in 2009 and 2010. The slope of this line represents a yield loss of 5.4 bu/ac over a 30 day period.

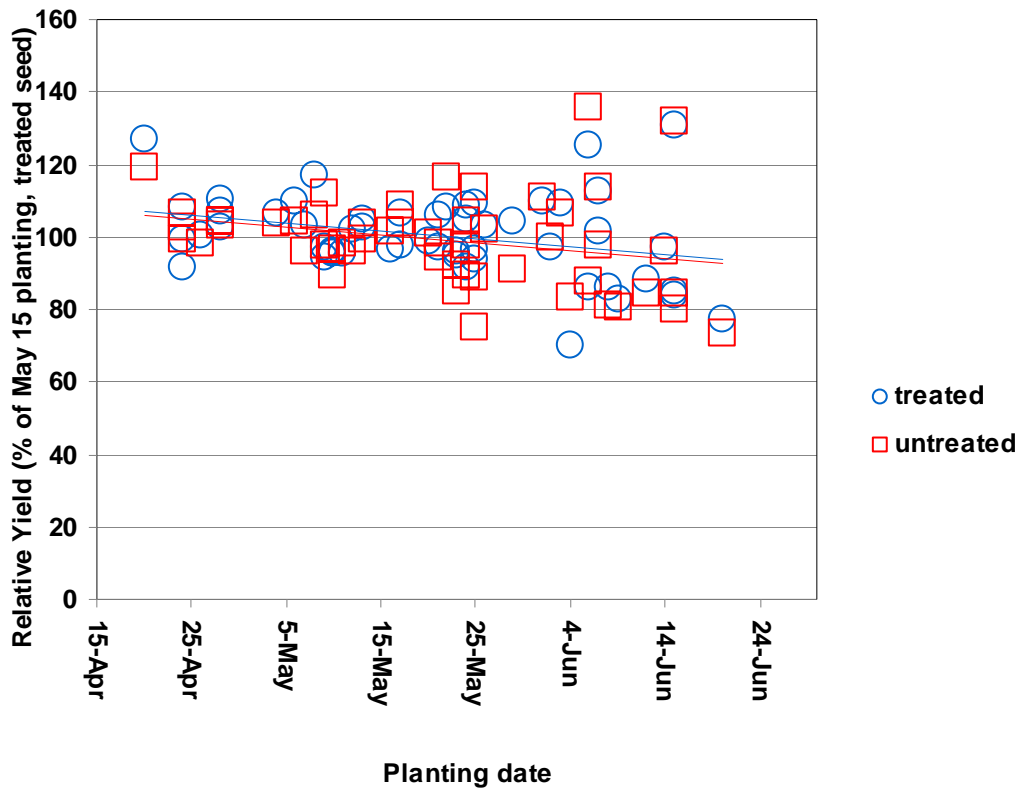


**Figure 2: Relative Yield based on Planting Date and Seed Treatment (2009-2010)**

Figure 3, below, shows the same comparisons as the above graph, except it includes all three years of the study (2009- 2011). Due to the unique growing season in 2011 some of the later planted beans yielded higher than the early and normal planted beans. As a result, the slope of the trend line for the three year data represents a yield loss of only 2.5 bushels/acre over 30 days. The yield loss associated with late planting in a “normal” year is likely closer to the 2009-2010 data and the 2011 year should be considered an anomaly.

**Summary:**

1. An early planting date had an advantage over a later planting date in most cases. Averaged across all three years of the study delaying to plant for 30 days cost an average of 2.5 bu/ac. This is a significant improvement in yield considering it costs nothing to plant early.
2. On average the longest day varieties yielded more than the adapted varieties, however the results were mixed at some sites.
3. Some varieties show greater yield gains than others with an early planting date. Planting a late maturing bean in June caused significant yield reductions, in 2009 and 2010, and is not recommended.
4. Unusual growing conditions, such as those experienced in 2011, can lead to a yield reduction for early planted beans if the maturity of the variety is too short. In other words choosing an early planting strategy should be coupled with picking a variety that longer than recommended for the area.



**Figure 3: Relative Yield based on Planting Date and Seed Treatment (2009-2011)**

**Next Steps:**

This was the final year of this three year project (2009-2011). The findings of this project will help to generate recommendations for ideal soybean planting dates and crop heat unit (or relative maturity) variety selections for Ontario soybean producers.

**Acknowledgements:**

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