

## 2012C018R - Determining replanting recommendations to maximize sugar beet production in Alberta



### **Lead Researcher and Team:**

Peter Regitnig, Research Agronomist and Bryan Avison, Research Agronomist.  
Lantic Inc., Taber, Alberta T1G 2C4

### **Background:**

In southern Alberta, sugar beet growers regularly experience the potential for reduced emergence stands due to wind, frost and soil crusting and a possible replanting decision if these reductions are severe. Replant studies have been conducted in various sugar beet growing areas on conventional sugar beets. The 2009 growing season was the first year of commercial production of Roundup Ready® sugar beets in southern Alberta. The absence of early season herbicide setback in a Roundup Ready® production system may alter replanting recommendations since surviving plants may be more vigorous than in a conventional system when a replanting decision is made. Also, the advent of GPS guidance systems on commercial tractors has improved the ease of replanting into existing sugar beet rows. In a commercial operation some first plant sugar beets generally survive when sugar beets are replanted directly into existing rows. Current replanting recommendations do not consider surviving beets, so factoring in surviving first plant sugar beets into the replant decision may alter recommendations.

### **Objective:**

Six years of sugar beet trial work was conducted between 2010 and 2015 to evaluate Alberta replanting recommendations in a Roundup Ready® production system factoring in surviving first plant sugar beets. Trials conducted for the first three years of this six-year study collected data on late May or June replant dates, which are reflective of replant situations that may occur as a result of wind events. An additional three years of study obtained data for mid-May replant dates when growers would typically experience plant losses from frost events.

### **What we did:**

Nine replicated small plot sugar beet field experiments were conducted over 6 years. Sugar beets were initially planted in ten different treatments and once plants were emerged 4 treatments were hand thinned to non-uniform plant populations of 30, 40, 50 and 60 sugar beets per 100 feet of planted row. These thinned populations represented levels of plant stand that would be considered for possible replanting in a commercial situation. A further 4 treatments were hand thinned to non-uniform plant populations of 30, 40, 50 and 60 sugar beets per 100 feet of planted row and then replanting was conducted over top of existing sugar beets in these treatments. In one treatment sugar beets were entirely removed and then replanted, while in a final treatment the initial emerged sugar beet stand was left intact. Surviving first planted sugar beets were counted after replanting. Individual plots were machine harvested and root yield, percent sugar, amino nitrogen, sodium and potassium levels were determined. Extractable sugar per acre was calculated for each treatment in order to assess replanting recommendations.

### **Key results:**

These trials indicated replanting may be recommended in Alberta if Roundup Ready® sugar beet stands fall below 50-55 beets/100ft in mid-May, 40 beets/100ft in early June and less than 30 beets/100ft in mid-June.

A sugar beet plant stand of 50 beets/100ft will yield about 89% as much as a full stand of beets planted on the same date.

On average, 55% of first planted beets survived the replanting operation in these trials and replanting into existing stands of sugar beets increased extractable sugar per acre relative to removing all first plant sugar beets before replanting.

**Take home message for the industry:**

Results from these trials allow producers to confidently make decisions when assessing whether to replant or leave a commercial stand of sugar beets that has been reduced by inclement spring weather events. The trials also suggest there is production value in using GPS guidance systems to replant into existing sugar beet rows.

**Value to the industry:**

Over the most recently reported 10 year period, replanting has ranged from 0% to 34% of Alberta sugar beet acres in any given year with an average of 7% of acres being replanted. The value of a replanting decision will fluctuate for each individual situation, but making the right decision has a positive economic impact on a percentage of sugar beet growers almost every year. If a correct replant decision is made 'not' to replant, it not only has a positive economic impact but also lowers the carbon footprint by eliminating further planting activity in a field.

**Value to the team:**

This work will help agriculture staff at Lantic Inc. when they are working with sugar beet growers and are being consulted regarding replanting recommendations.