CANE, TERRANCE L., The Amalgamated Sugar Company LLC, 138 West Karcher Road, Nampa, Id 83687. **Strip tilling and planting sugar beets into established alfalfa.**

ABSTRACT

Many growers along the Snake River plain of south western Idaho in Amalgamated Sugar Company's Elwyhee District depend on alfalfa as part of their crop rotation. They struggle with the effort it takes to prepare a field for planting to sugar beets. Often time these fields are prone to strong persistent winds that move soil, thus damage or destroy the young emerging sugar beets. Growers were looking for ways to reduce tillage in alfalfa plus reduce the harmful effects of the winds.

These growers were introduced to strip tillage in sugar beets in late 2007. In 2009, two fields, a 75 acre and an 80 acre was strip tilled and planted into established stands of alfalfa by two different growers. Both fields were strip tilled using a 12 row Schlagel strip tiller with GPS guidance system. Removal of alfalfa was achieved by the use of Roundup herbicide. One field was applied post plant while the other field was treated prior to the last cutting in the previous fall. The first field was strip tilled on March 16th and 17th with 22 units of nitrogen, 60 units of phosphate along with some micro-nutrients injected in behind the ripper shank at a depth of 7-8 inches. The balance of the fertilizer was top dressed and water incorporated in late May. Planting was done on April 6th with a John Deere MaxEmerge planter equipped with Yetter trash managers. Seed spacing was set at 51/2 to 6 inches resulting in a beet stand of approximately 142 beets in 100 feet of row. New growth of alfalfa had already started by planting time so an application of 44 oz. of Roundup, 17 lbs. AMS, non-ionic surfactant along with Asana insecticide for cutworms was made by ground rig on the 17th of April. The field was then irrigated to establish a beet stand. The first in season herbicide application was made around the 12th of May at the rate of 32 oz. Roundup, 17 lbs. AMS, a non-ionic surfactant and an insecticide applied by ground rig. Beet growth at this time was at the 2 to 4 leaf stage. The second in season Roundup application was applied at 8 true leaf stage. A fungicide treatment for powdery mildew was applied by air in late July.

The second field was a 5 year old stand of alfalfa that in the fall of 2008 was treated with 32 oz. of Roundup then a day later the last cutting was harvested. In early March of this year (2009), 5 tons or 10 yards of compost was top dressed to the field. The compost had an analysis of 11 pounds Nitrogen and 17 pounds Phosphate per yard or 110 pounds N and 170 pounds P per acre applied. It was then assumed that only about ½ of the P would be available the first year. The field was then strip tilled March 11 through 13. At this time 100 pounds of 10-34-0 (10 units of N) with 1 gal of humic acid was shanked in with the tiller. The balance of the fertilizer needed was applied by top dressing in mid-May following the use of a good soil sample.

Planting started on the 13th of April using a 12 row Milton planter. Seed was spaced around 5 inches apart. This resulted in a stand count of about 160 beets per 100 foot of row. The field was watered using a germination nozzle package in the center pivot. The field was then sprayed pre-emergence with 44 oz. of Roundup, 17 lbs. AMS and a non-ionic surfactant applied by air. Lorsban insecticide was included in the tank mix for cutworm control. Alfalfa re-growth was about 6 inches tall at this time. On May 18th a treatment of 32 oz. Roundup, 17 lbs. AMS along with 6 oz. of Stinger was applied by air to 2/3rds of the field. The remainder of the field did not have Stinger in the treatment. Beet growth was from 2-6 leaf stage with alfalfa escapes 6-8 inches tall. Monsanto reps suggest alfalfa to be this size for best control. This also allowed

for late emerging alfalfa to receive treatment. By mid-July most of the alfalfa was controlled leaving only some late emerging grasses and a few small broad leaf weeds which was controlled with 22oz of Roundup, 17 lbs. of AMS along with a fungicide for powdery mildew control.

In the Elwyhee District in 2014, 36% of the strip tilled acres was completed in alfalfa using mostly 12 row Schlagel or Orthman 1tRIPr equipment with GPS plus one grower using a tiller they designed and built. Planting was completed using 12 row John Deere MaxiMerge planters with GPS and one grower using a 12 row Milton planter with an Accu-trac. Following a three foot soil test, approximately ½ of the recommended nitrogen and all of the phosphate along with other micro-nutrients needed was injected in the center of the tilled strip at a depth of 8-10 inches depending on soil condition. The balance of the nitrogen requirement is applied top dress in dry formation then water incorporated using sprinkler irrigation. Alfalfa and other weeds were controlled using Roundup herbicide. Some fields were treated prior the last alfalfa cutting the previous year at 32 oz. per acre, while most are being treated pre-plant or pre-emergence at the rate of 32 oz. followed by in season applications. Timing of in season applications varied between growers and fields due to weather conditions, timing of irrigation, alfalfa and weed growth among other conditions. An insecticide is always included in the early herbicide applications for control of cut worms. One to two applications of a fungicide for powdery mildew control is applied starting in early to mid-July.

Results for 2009 on 155 acres of strip tilled alfalfa averaged 42.3 t/ac, 16.4% sugar, 233 ppm NO3 with 11775 ers/ac. Compared to these growers 258 conventional tilled acres averaged 40.4 t/ac, 16.0% sugar, 253 ppm NO3, 10874 ers/ac. District averages for all acres was 9883.4 acres at 36.4 t/ac, 16.4% sugar, 350 ppm NO3, 10049 ers/ac.

In 2014, 60% of all growers in the Elwyhee District were using strip tillage on 3411 acres (31% of all beet acres grown) with 36% of those acres strip tilled into established alfalfa. The harvest data of 284 acres of the 1227.9 acres strip tilled into alfalfa has been omitted due to the information has been compromised (harvested with conventional tilled sugar beets). Final results of 944.2 acres strip tilled into alfalfa averaged 41.63 t/ac, 16.5 % sugar, 232 ppm NO3, 11496 ers/ac. Compared to all acres grown in the Elwyhee District on 11016 acres averaged 38.21 t/ac, 16.8 % sugar, 248 ppm NO3, 10769 ers/ac.

Most growers recommend tractor hp. of 25-30 hp. per row for a 12 row strip tiller in established alfalfa. Irrigation water run-off or erosion has been eliminated on steeper slopes along with controlling wind-blown soil. In six years of strip tilling in alfalfa, no replanting has been necessary and no cultivation has been used. Always include an insecticide for cutworm control. While most growers feel there is a cost saving, no dollar amount has been calculated due to the many variables of inputs. One caution is to verify that the field is conventional alfalfa and not a Roundup Ready variety.