

Resource efficiency for field crops

by Hugh Maynard

Question: what's made of corn sugar, fish ash and seaweed?

Answer: whatever it is, mix in a little rock phosphate, some dry blend fertilizer and limestone and potatoes love it.

The concoction is officially known as a Biological Potato Beetle Control and trials in the U.S. resulted in yields of 600 cwt per acre - double the norm - of #1 potatoes. REAP-Canada is repeating those trials with the full biological mix applied as a starter fertilizer, along with a control section and a modified biological application that has some of the ingredients removed to compare the effect.

The theory is that plants with high sugar levels make leaf chewing insects sick; just like a baby or young calf will dehydrate from continued vomiting, so will the insects as they continue to munch on the potato plants' leaves. Eventually the insects die.

The other ingredients are complementary in their actions. Phosphorus dribbled on to the soil acts as a bug deterrent and although the soft rock version contains 18% phosphorus, only 2% is available at any one time, making the nutrient more available throughout the length of the growing season. Ammonia sulfate, once used in the refrigeration process, helps to stabilize the soil temperature at approximately 70; F, thereby helping to promote yield through more stable growing conditions.

Sweet yields

Sugar also plays a role in the soybean foliar spray study being conducted at the same Tavistock, Ontario site by REAP-Canada. Jeff Quinn, project supervisor, explained that the objective of the foliar applications was to induce the plants to flower, which, in turn, would

stimulate the soybean plant to put more energy into seed production rather than vegetative growth.

The fruiting foliar spray is a 9-18-9 mixture composed of phosphoric acid, liquid ammonia sulfate, 21% aquaius-ammonia, liquid fish extract, corn sugar and seaweed. The additional cost of the spray is \$12 per acre, which requires at current prices only two bushels per acre to break even.

ÒNitrate is the nutrient factor that we're trying to overcome,Ó said Quinn, pointing out that nitrate N promotes growth while ammonia N promotes fruiting. ÒOver application is as much a problem as under in this trial,Ó he added.

Quinn is utilizing several in-season testing methods to keep track of the foliar spray effects on the soybeans. Sugar testing with a refractometer, soil temperatures and pH levels are monitored, as well as posting flags throughout the field for regular spot checks.

ÒNow we know before we combine whether or not new applications like the fruiting foliar spray are actually working,Ó he said.

Squeezing for sugar

Bugs like plants with low sugar content and are drawn to plants in this condition like bears to honey. The REAP-Canada research is designed to ascertain whether the application of a foliar spray during the growing season helps to increase the sugar level within the treated plants. Plants with a Brix reading greater than 12 are left alone by insects; a demonstration of reading sugar levels with a refractometer during the field day revealed that untreated soybeans had a Brix of 4.5 while plants treated four days earlier with the foliar spray registered Brix 6.

Copyright © 1993 *REAP Canada*