



## Nitrogen Split Application – A Producer Profile

Ron and Judy Leonard of Harris, Saskatchewan have been split applying all their crops' nitrogen requirements since 2000. They farm 7000 acres with Ron's brother Blair and sister-in-law Rhonda in the dry, dark brown soil zone. They consider nitrogen split application as a risk management tool in their dryland operation.

Prior to splitting their crops' nitrogen needs, Ron and his brother felt uneasy about spending all their fertilizer dollars before or at the time of seeding. Rainfall was becoming more unpredictable, and they were not seeing consistent yields applying all their fertilizer in the early spring. They direct seed with a Bourgault 5710 air drill on a 7 inch row spacing, and were limited in how much nitrogen they could place with the seed. They use two sets of openers – a 3/4 inch knife opener for cereals and pulses, and a 2-1/2 inch spoon for canola. Although the wider spoon allowed them to get more seed placed fertilizer down, banding operations in the late fall or early spring were required to get adequate nitrogen requirements in the soil. They decided that banding prior to seeding was not the answer. It was an extra operation that dried out the soil to the point it crusted and inhibited germination, especially with canola.

The Leonards needed another technique to address their crops' nitrogen requirements. They wanted to reduce the risk of placing all their fertilizer dollars into drier spring soils, and utilize nitrogen fertilizer more efficiently. At this point, they decided to investigate split applying the crops' remaining nitrogen needs post emergent. While split applying nitrogen is a risk management tool, particularly in drier areas, it carries with it a high degree of risk. The Leonards soon learned that the success of this system depends on two critical factors – early application of the nitrogen and post application precipitation soon after.

To date on the Leonard farm, approximately 5000 acres (all the cereal and canola acres) receive the second application of nitrogen within a couple of weeks after emergence. They try to time the second application when the cereals are at the three leaf stage, while the canola receives the second application prior to bolting. Ron bases the amount of nitrogen he split applies on a soil test. Generally, he places 15 to 20 lbs of actual starter nitrogen, as well as the other required nutrients, with the seed. The amount of nitrogen applied post emergent is based on an evaluation of the current crop and moisture conditions. If yield potential is high, then greater amounts of nitrogen are applied - and vice versa. Ron says since beginning split application, he has improved yields up to 20% and increased protein concentrations by as much as a full percentage point.



*The Leonards use a commercial high clearance sprayer to apply the fertilizer. They can cover up to 1000 acres per day.*



*A modified hopper bin is used to store the UAN solution. Two inch lines are used to speed up filling.*

He also feels more confident that his fertilizer dollars are being utilized more efficiently.

The system developed by the Leonards to apply liquid UAN (28-0-0) to their crops is relatively simple. A Case IH high clearance sprayer with an 800 US gallon tank is used to apply both liquid fertilizer and post emergent pesticides in a tight season. For spraying the post emergent pesticides, they use the factory built booms that came with the sprayer. To apply the UAN, they designed a home-built boom system with single orifice nozzles spaced on 12 inch centres. To change the boom systems, it takes Ron and his brother approximately 10 minutes to remove a couple of pins, replace the booms and tighten connections. The total cost of the materials to build the complete boom was approximately \$850. The single orifice nozzles were included in this price, however Ron states that each individual nozzle cost approximately \$5.

To deliver UAN to the field, the Leonards have a truck with a 1300 Imperial gallon poly tank that nurses the liquid fertilizer from a 14,000 gallon hopper bin in the yard. Because the plumbing from the bin to the truck into the high clearance sprayer is comprised of two inch stainless steel, the liquid transfer is relatively quick and limits downtime from filling. Depending on the rate of UAN application, Ron says it usually takes 30 minutes to empty the sprayer tank. On a good day, it is not uncommon for the Leonards to apply nitrogen to 1000 acres. Having a GPS system in the sprayer cab allows them to spray at night, which results in coverage of extra acres per day.

The nozzles are designed to apply a single stream of UAN on 12 inch spacing. Leaf burn is not an issue for two reasons. First, by applying the UAN early enough (i.e. before the crop canopy fills in), the product hits the ground rather than the plants. Second, if the UAN stream does hit the plant, the product is heavy enough it usually rolls off the leaf surface and onto the ground. The sprayer usually applies the product at a pressure of 60 to 70 pounds. Ron says he is more concerned about the high-pressure stream cutting off plant foliage than leaf burn. With regards to the 12-inch nozzle spacing, Ron has not noticed any crop variability from nozzle row to nozzle row. He says one of the keys to success of this system is to get rainfall shortly afterwards - to help move the nitrogen from the surface into the rooting zone for plant uptake.

The Leonards usually apply 50,000 gallons of UAN post emergent in a season. Their local ag retailer has no problem supplying the product at this time of year. The product is usually loaded at the manufacturing plant onto B-trains and delivered directly to the hopper bin on the yard. The Leonards



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reduce downtime by maintaining good communication with the dealer to ensure the hopper bin is always full of product.

Along with regularly spraying the 7000 acres of in-crop herbicides and applying insecticides when needed, the Leonards high clearance sprayer is the most utilized piece of equipment on their farm. They hire an employee to help with the daily operations, and use post emergent herbicides with wider windows of application to help spread out the workload. Timing is critical to the success of this system. To stay on top of things, they scout fields to determine leaf staging and decide when application is necessary.

The Leonards plan to continue their practice of split application in their LDS operation. "Spring seeding is usually facilitated because we do not have to handle as much fertilizer nitrogen when filling the drills," explained Ron. This allows the Leonards to reduce their downtime during this busy season allowing them to seed more acres in a day. Ron also states that they can better manage their crops' nitrogen requirements, thereby reducing the impact of escalating nitrogen costs. He says the success of this system is enhanced by a proper setup and a producer's commitment to stay on top of things. "Early application is critical to maximizing yields, and any significant downtime could mean missing the window of opportunity", said Ron.

#### **For more information contact**

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