



HIGH SPEED and accurate application rates convinced Nebraska farmer Bryce Naber to try an Exactrix system.

PLAY TAPPS FOR FERTILIZER COSTS

New technology can cut fertilizer rates by 40%

By John Russnogle

THE TELEPHONE in Guy Swanson's Spokane, WA, office has been ringing regularly with calls from Canadian farmers. Anhydrous ammonia costs there are more than \$800/ton (U.S.), and the farmers want to know if Swanson can save them some money. Growers across the Great Plains and Corn Belt are asking the same question.

An inventor, entrepreneur and savvy businessman, Swanson appears to have the right fertilizer system for the times. In 1998 Swanson sold his first Exactrix system that injects anhydrous ammonia (NH_3) as a liquid. The benefit is accurate, uniform,

lineal application rates that allow farmers to reduce nitrogen (N) rates.

"With NH_3 applied as a single product using Exactrix equipment, we recommend farmers reduce nitrogen rates to .8 [80%] of the recommended rate for fall-applied NH_3 , .6 [60%] for preplant and .5 [50%] for side-dressed corn," Swanson says. "Even with those reduced rates, yield increases of 5% are common."

Swanson expanded the Exactrix system in 2002 when he started to sell equipment and technology that allow growers to apply NH_3 and liquid phosphorus, sulfur and zinc simultaneously in a band. It's an improved version of the dual banding technique growers used in the 1980s.

Continuous band of fertility

"We dual-apply liquid NH_3 with ammonium polyphosphate (APP), 10-34-0, and ammonium thiosulfate (ATS), 12-0-0-26S, through two tubes mounted on the farmer's choice of opener," Swanson says. "The blended polyphosphate and thiosulfate streams out in front of the NH_3 . The liquid NH_3 drives >>>

EXACTRIX INVENTOR Guy Swanson (left) makes frequent field trips to check with growers such as Chris Ziegler (center) and his farming partner Ron Hirschfeld.





GUY SWANSON'S unique fertilizer system produces higher yields for some growers.

Naber originally mounted his Exactrix equipment on a John Deere 1690 air seeder set on 15-in. spacings. "I hooked onto the drill in the spring and applied NH_3 with it and then switched to beans," he says. "With custom work I've got close to 30,000 acres on the machine."

Because a wet spring this year delayed fieldwork, Naber swapped the Exactrix equipment onto a 40-ft. toolbar and set openers on 30 in. for side-dressing. "Next year I might double rank the bar and try 15 in. for wheat and side-dress as well," he says.

"You have to farm a lot of acres to make it pay. I let the custom work pay for it. But it's well worth the money. You can reduce rates using the cheapest form of nitrogen which is a heck of a price savings."

Timing, price

While Swanson sells fertilizer equipment under the Exactrix name, he promotes a production system that emphasizes efficiency and economy. "It's all about technology and timing. How much benefit you get from the Exactrix equipment depends on how you use it," he says. "Ideally, we'd apply all TAPPS the first week in June as a side-dress application. That's the most efficient method, but just isn't practical. I do think it's reasonable for farmers with their own applicator to consider applying one-third of their acres in the fall, one-third preplant and one-third as side-dress. That helps spread your weather risk."

TAPPS works great in no-till, for a number of reasons, according to Swanson. "You've got soil structure that isn't compacted so water moves easily through the soil profile," he explains. "Leaching can be a problem for nitrogen if it's applied as a single product. It's particularly a problem under irrigation or areas that receive more than 20 in. of annual rainfall. With TAPPS, the ATS will hold the nitrogen in the band."

No-till systems also maintain >>

through the blended APP/ATS polymer at around 180 mph, forming triammonium polyphosphate sulfate, or TAPPS. It's the most plant-available form of placed nitrogen, phosphorus, sulfur and zinc. You can't buy it; it must be formulated in the field. Formulation makes variable-rate technology practical with the correct algorithm."

Dual placement, by contrast, required that the NH_3 be placed deep to avoid loss, and the liquid fertilizer was placed above the NH_3 where the two products rarely met. Because the NH_3 wasn't liquid, farmers had trouble with lines freezing, and if the two products mixed at the tube ends, it caused plugging.

TAPPS is a crystalline product that forms a continuous, concentrated band of fertility with a pH of approximately 8.5, according to Swanson. "Roots feed out of that band and it minimizes the effect of variations in soil pH and organic matter," he says. "Those pockets of low yields that show up on yield monitors tend to disappear."

Different micronutrients become available at different pH levels, so as the TAPPS band shifts pH and the pH lowers, a wide variety of micronutrients becomes available to plants, according to Swanson.

An added benefit of TAPPS is the nitrogen stabilization effects of the ATS. "ATS keeps the nitrogen in an ammoniac form for six to eight weeks longer than if you applied the NH_3 as a single product," Swanson says. "If you apply TAPPS preplant, the nitrogen stays in its most plant-available form into June. Otherwise,

it starts to convert to nitrate and can leach deep into the soil."

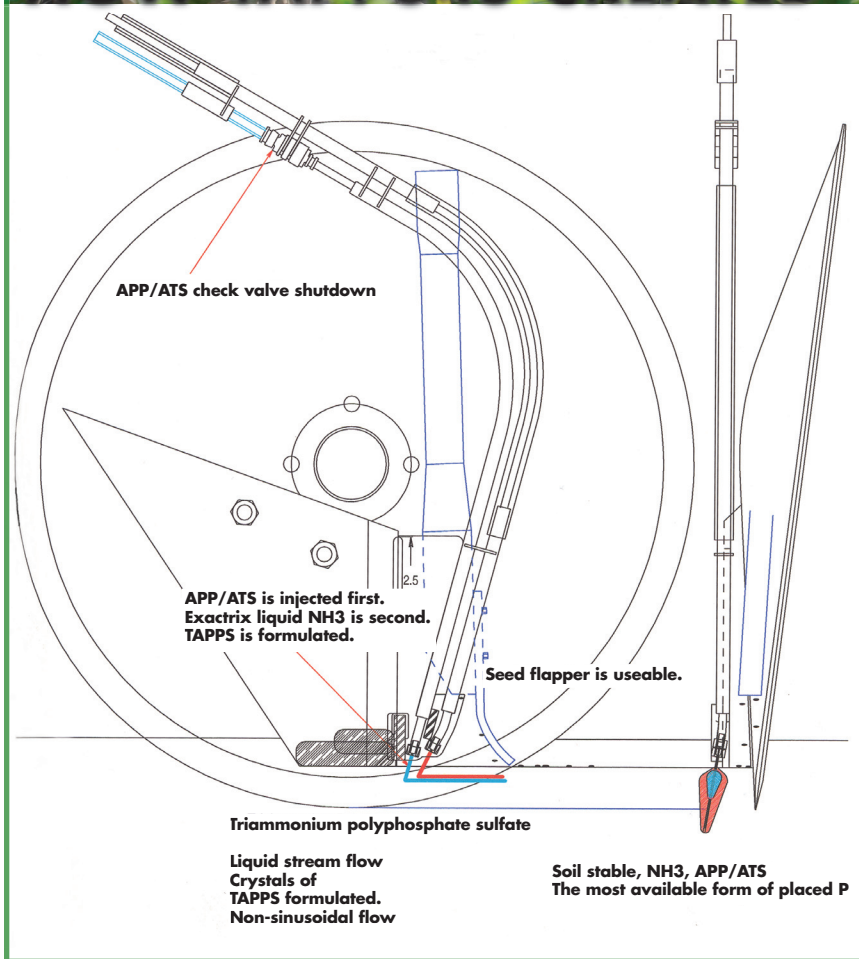
Farmers who apply TAPPS typically see a 10% increase in production, according to Swanson. "We have one grower in western Kansas who grew 258 bu. pivot-irrigated corn with just 125 lbs. of applied N, TAPPS formulated," he says. Swanson backs his claims with both university research data and on-farm test plots.

Lower nitrogen rates, greater speed

Bryce Naber, Albion, NE, started dual banding nine years and a couple of machines ago. "I don't think I really got the full benefit of double shooting until we switched to the TAPPS system," he says. "On corn following beans, we've cut our N rates to 130 to 140 lbs. and maintain yields of 200 to 250 bu./acre."

"On continuous corn ground, we pre-plant or side-dress 140 lbs. of N and follow that with another 30 lbs. of slow-release N mixed with postemergence herbicide. We may put another 30 lbs. of N down with the pivot. We don't have a lot of experience with corn on corn, so we're spoon feeding it through the season."

Application speed is what really sold Naber on the Exactrix system. "My goal is to cover 10,000 acres a year, between the land my dad and I farm and custom application," he says. "You can't do that with one man running a shank machine. With the Exactrix equipment you can use a single-disc opener and run up to 10 mph. You can do more acres faster and use less fuel."



the rotational concentrated fertilizer band and the production boost it provides, Swanson says. Tillage, conversely, destroys that advantage. “If you’re in a tillage system, TAPPS application should be the last field operation before you plant,” he says.

All that technology comes at a price. It depends on the size of applicator bar you want to build, but an Exactrix system built for anhydrous only starts at around \$45,000. A TAPPS system starts at \$60,000 and can hit six digits, depending on how many bells and whistles you want with it.

The more expensive Exactrix systems are equipped for variable-rate application, GPS mapping and a Legacy 6000 controller.

That cost didn’t bother Waco, NE, farmer Chris Ziegler last year when he convinced his farming partners to put together a 12-row, 30-ft. bar equipped to apply TAPPS on 30-in. centers. “At current NH₃ prices, if we can reduce our nitrogen rates by 40% and run the machine over 5,000 acres, it will pay for itself every year,” he says. “We took a shotgun approach to nitrogen rates recommended by our crop consultant this year and applied

EXACTRIX GLOBAL Systems LLC builds mounting assemblies for more than 25 different single-disc and shank openers that allow liquid phosphorus, sulfur and zinc to be applied just ahead of NH₃. The result is a band of crystalline fertilizer that is triammonium polyphosphate sulfate, or TAPPS.

1,000 acres each at .6, .7, .8 and .9 rates. Based on how the crop looked visually in mid-July, we should have gone with a .6 rate on all of it. We’ll do some tissue tests to check for differences among the different rates.”

Ziegler figures he’ll add his name to the list of Exactrix buyers who have become believers. To date, Swanson has sold more than 650 Exactrix systems that are used on nearly four million acres. His clients’ addresses range from Canada to Texas, Idaho to Indiana.

Experienced engineer

The TAPPS system is the culmination of years of building and design for Swanson. Growing up in his father Mort’s fabrication shop, he learned how to build big equipment that would stand up to the rigors of the Palouse hills. While still in college, he helped his dad build a 318-hp, self-leveling sprayer with a 165-ft. boom. After college he spent time with Caterpillar before returning to the family business in 1973.

Swanson and his dad made their big mark in the farm equipment business with a massive no-till drill they first sold in 1979, which became known as the Yelder drill. “We built a 20-ft. no-till drill that could apply NH₃, dry or liquid fertilizer, insecticide and seed,” Swanson says. “It could meter seven different materials simultaneously and was rugged.”

The Swansons built the last Yelder drill in 1995. After another brief stint with Caterpillar, Swanson started to bring together the components for his first Exactrix system.

For more information, contact Exactrix Global Systems LLC, 3310 E. Trent Ave., Spokane, WA 99202, 509/535-9925, visit www.exactrix.com or www.freeproductinfo.net/fin, or circle 109.

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