

Less Is More....an unlikely business scenario.



Exactrix owners report 12% more net margin... from \$100,000 to \$1.5 million additional annual net margin.



The total investment is often paid for in the first 2,000 acres.

Lineal Uniformity, Geometry, Chemistry, Physical Structure and Superior Engineering

2011



Award winning high speed tool bar, Friend, NE. Orthman, Bourgault, & Exactrix.



Exactrix USDA Tool Bar, P-51 Mustang Swiveling Single Disc Openers.

Practicing five annual factors brings good yields and excellent nutrient efficiency. Apply 166% more crop available N and 200% more crop available P with TAPPS.

1. Timing of application.
2. Uniformity, lineal stream, exact band width with every band on every acre on every field....exactly applied.
3. Root pattern geometry.
4. TAPPS formulation of balanced nutrients.
5. No-Tillage practices provide additional nutrients timely.

Practicing three perennial factors improves yields and nutrient efficiency.

1. Rotation.
2. No-tillage, Rotational Band Loading.
3. Adjusted soil pH. Optimum 7 to 7.5 pH.

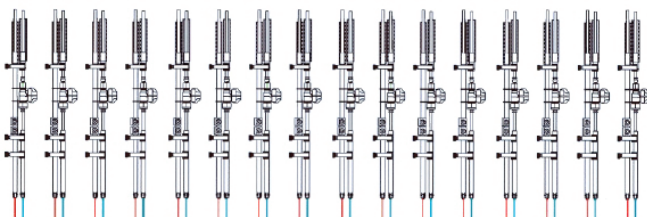


June 23, 2006 Yuma, CO Steve McCasland, side dressing, single disc.



October 2008 Genesee, ID One pass campsite. Logistics are important.

The TAPPS band width is exact.

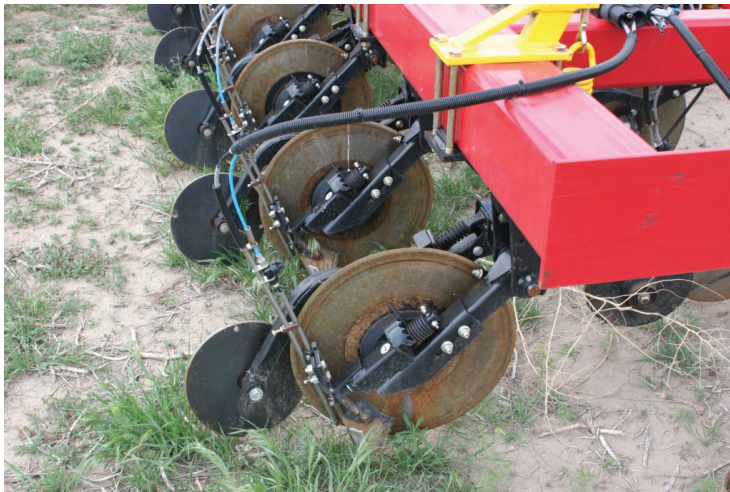


Each opener band is applied within 1%, formulating TAPPS.

The band concentration or the band width or the band diameter remains constant across the applicator pass. There is no over and under concentration of nutrients. Over concentrated bands cause root burning and or pruning. The bands are homogeneous with zinc and sulphur and phosphate combined with ammoniac nitrogen feeding plants with a balanced nutrient crystal band.



Single Disc Openers allow side dressing right after planting. Low disturbance P-51.



Bourgault MRB-25 single disc openers injecting TAPPS.



Scott City, KS, Chris Winderlin pre-plant and side dresses irrigated production with this award winning tool bar. Moore-Built, Bourgault, Exactrix is conjoined.

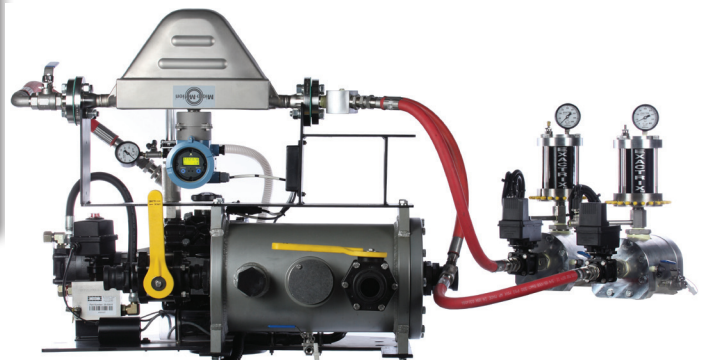
Corn and Wheat

Consider a tool bar that does both pre-plant application and side dressing

1. Index the banded nutrients with guidance.
2. Setup NH₃ trailers to pre-plant or side dress.
3. Consider NH₃ transport delivery.
4. Consider side dress on sandy soils.
5. Consider pre-plant application on 2/3 of your acres.
6. Use single disc openers for high speed pre-plant applications and low disturbance side dress applications.
7. Start side dressing immediately after planting.
8. Design your tool bar and trailer to handle big corn.
9. Hedge your bets...keep your options open.
10. Maximum nutrient efficiency and top yields may require two passes formulating TAPPS.
11. Qualification for Tier 3 CSP is possible.
12. Timing drives crop production decisions.



A 40/60 blend of APP/ATS weighs 11.22 lbs per gallon. The F Series meter confirms product quality, correct blend and allows a sale at the Exactrix.



Exactrix 2KM TAPPS Formulator. Utilized by custom applicators to apply APP/ATS by specific gravity and weight at 11.40 lbs per gallon typical, APP. Weighs the material as it is applied and confirms proper manufacture of 10-34-0.



Double crop side dress sunflowers with swiveling P-51 Mustang openers results in virtually no soil disturbance.

At Colby, KS, side dressing or indexed pre-plant application brings best returns.

No-till single disc application provides flexibility in all soil types.

Maximum nutrient efficiency with applying TAPPS into growing roots.

Excellent yields with timing of Exactrix TAPPS Formulation.

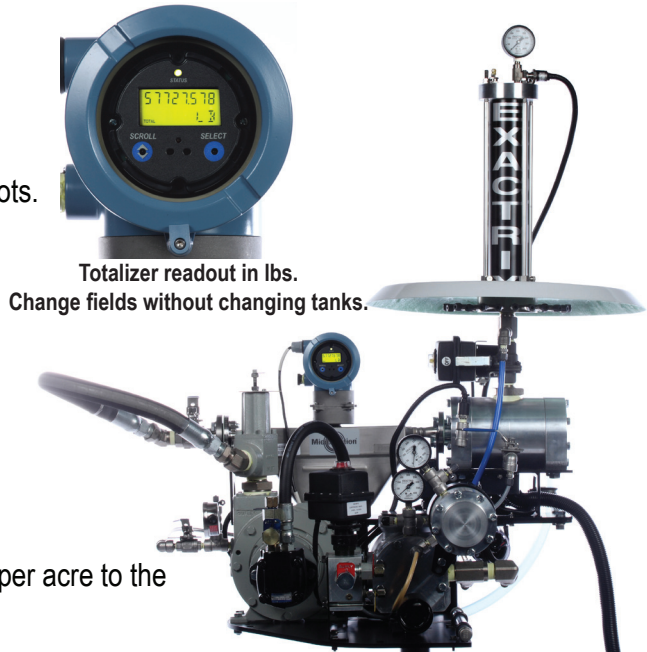
Exceptional returns on investment.

Apply 166% more crop available nutrients.

Add 12% more net margin.

In irrigated corn production producers bring 150 more net dollars per acre to the bottom line in 2008.

Exactrix has received national and regional awards for exceptional product and customer service.

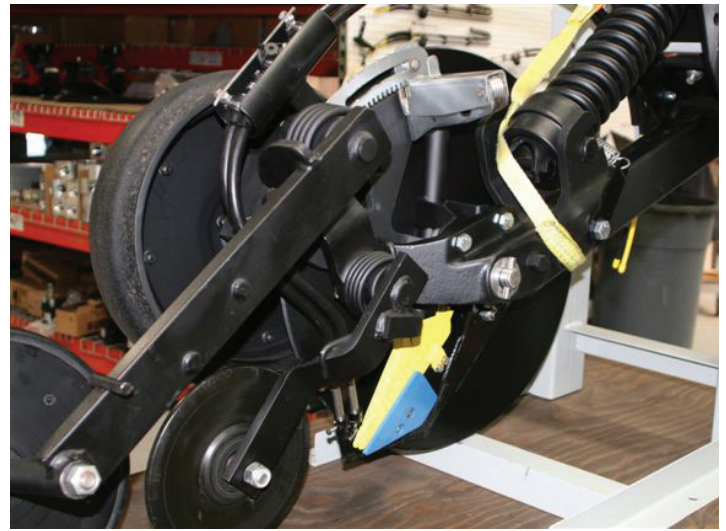


Totalizer readout in lbs.
Change fields without changing tanks.

2KC Weigh Master, weighs NH3 as it is applied.
Award winning design.



Deere 1890, 1990, an ideal pre-plant banding tool, 10, 12, 15 inch spacing.



Series 800 Case SDX, TAPPS Formulator, seeding and banding, and banding only.



Lovell and Cook, Ririe, ID, 25 years continuous no till at 5,200 feet. Spring wheat seeding with a Deere 1895, AGPro seed metering, Yielder Drill and Exactrix.



Case SDX, 10 inch seed row spacing, ideal Exactrix tool. Mott, ND.

High Speed Single Disc Openers Place Nutrients Without Tillage.

1. Pick the opener group that matches your system.
2. Pick the machine that matches your rotation.
3. Formulate TAPPS to match your crop needs.
4. Maintain a Rotational Band Loading System.
5. Landscape, soil type, rainfall pattern, and rotation determines machine design.



Craig Rife: Western Corn Belt, 620-727-3995

Virgil Wiest, Northern Tier, , 509-952-5458

Pat Lancaster, Central and Eastern Corn Belt, 317-690-0474

General Office, Spokane, WA 800-929-9289 509-535-9925

www.exactrix.com



Looks like a top fuel dragster that burns NH3 and Poly-phosphate.

Panhandle, TX, Case SDX setup for 15 inch band spacing, pre-plant corn and wheat side dress. Manufacturing TAPPS with the 2KC Weigh Master and the 2KP TAPPS Formulator.



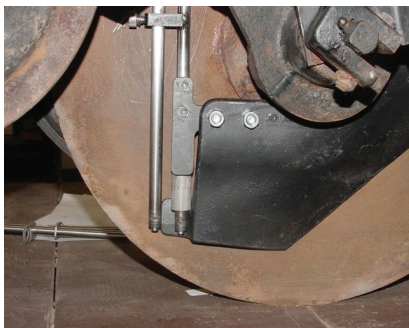
Albion, NE, a single pass winter wheat system or a two pass winter wheat system with the Deere 1690 CCS. A pre-plant nutrient tool for corn production. The first seeder to fertilize soy beans with wing injection of NH₃, APP/APS.



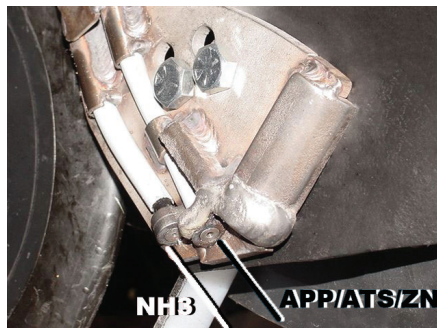
A two pass no-till applicator. Fertilizing winter wheat in side dress late fall application with a Case SDX 15 inch band center. The SDX has 32 openers and applies nutrients in the spring for irrigated corn production. Application speeds are 7 to 8 mph.

No-Till pre-plant corn production using single disc drills.

1. Allows drill utilization in 3 seasons. Winter wheat seeding with wing injection. Soybean seeding with wing injection. Pre-plant corn fertilization, spring or fall.
2. Excellent return on machine investment. Excellent reports from producers with milo, corn, soybean, canola and winter wheat rotations.
3. Allows radical root access for soybean and wheat. Soybeans can be fertilized. Wing injection starves the weeds, feeds the crop.
4. Setup on 10 inch spacing for best corn root geometry in pre-plant corn production.
5. Allows side dressing of winter wheat. The 10 inch drills are ideal for all rotations with wing injection.... 10 inch beats 7.5 inch spacing.



Deere 1895 mid row banding can be set up Paired Row. A good tool west of the Continental Divide.



Deere 1890 wing injection will also fertilize soybeans. A powerful tool on the Great Plains.



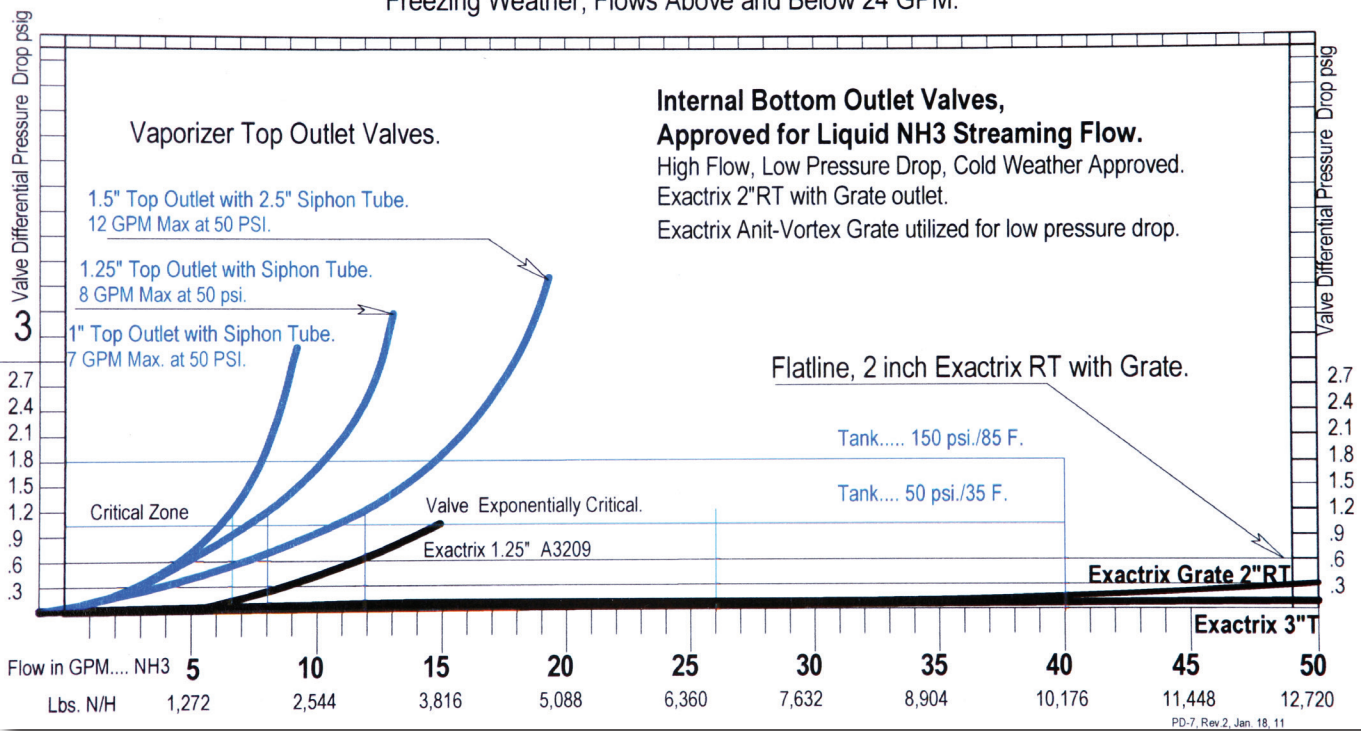


Exactrix 2 inch RT valves with guarding and parking caps. Approved in all states.



Easy and safe connections with remote bleeder lines and safety rope shutdown.

Freezing Weather, Flows Above and Below 24 GPM.



Exactrix Bottom Outlet Internal Valves Save Time and Money...Safer!!

Exactrix two inch RT internal valves shown at 40 gpm nominal...twin tank 80 gpm nominal.

Exactrix three inch internal valves are offered for large single tanks at 80 gpm nominal.

In airseeder applications twin tanks are required with 1.25 inch internal valves at 20 gpm nominal. Top outlet tanks are approved in twin tank application to 14 gpm nominal. Single 1,500 gallon tanks are rated to 12 gpm with the A-479 ST 1.5 inch top outlet valve. Twin tank top outlet A-479 valve rated 24 gpm.

Understanding tank flow capacity is critical in system engineering design to assure cold weather performance. Your Exactrix sales engineer will design the tank supply system.

Advanced Process Control & Mapping



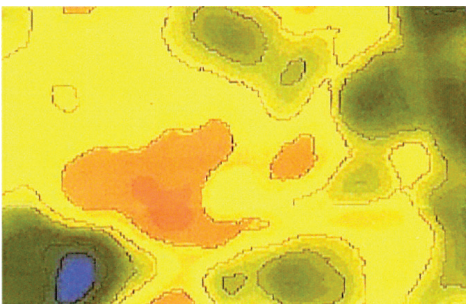
Compatible with ISO BUS terminals



Multiple section controlled with auto boom.



Multiple Product Systems, Variable Rate Technology, Map Making Technology,
Also available with Data Link connection for Raven, Ag Leader, Trimble Mapping Controllers.
Write your application VRT at .6 of the soil lab recommendation and bring a great return to the bottom line. Reduce risk.



"Stand on the shoulders of giants"

Full VRT response in 1.5 seconds at the injection point at pressures from 10 to 350 psi with dual stage orifice flow...a 50x regulated flow margin.

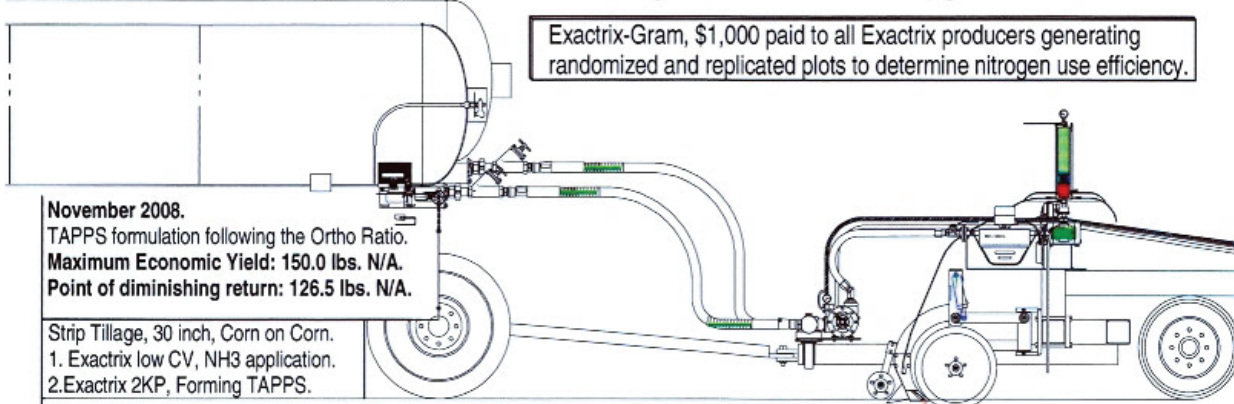
Exactrix Test Plot Data Confirms Nutrient Efficiency

2008, 1st year.

Continuous Corn Strip Till

CORN

Exactrix Test Data supplied by producer Ben McClure, Hugoton, KS. and Garrett Havel Agronomist.



November 2008.

TAPPS formulation following the Ortho Ratio.

Maximum Economic Yield: 150.0 lbs. N/A.

Point of diminishing return: 126.5 lbs. N/A.

Strip Tillage, 30 inch, Corn on Corn.

1. Exactrix low CV, NH3 application.

2. Exactrix 2KP, Forming TAPPS.

Yield Goal established at 210 bushels per acre.

Supplemental Irrigation System.

Hail Damage in June reduced overall yield potential in the general area.

Large field size plots randomized and replicated 4 times or 28 total plots.

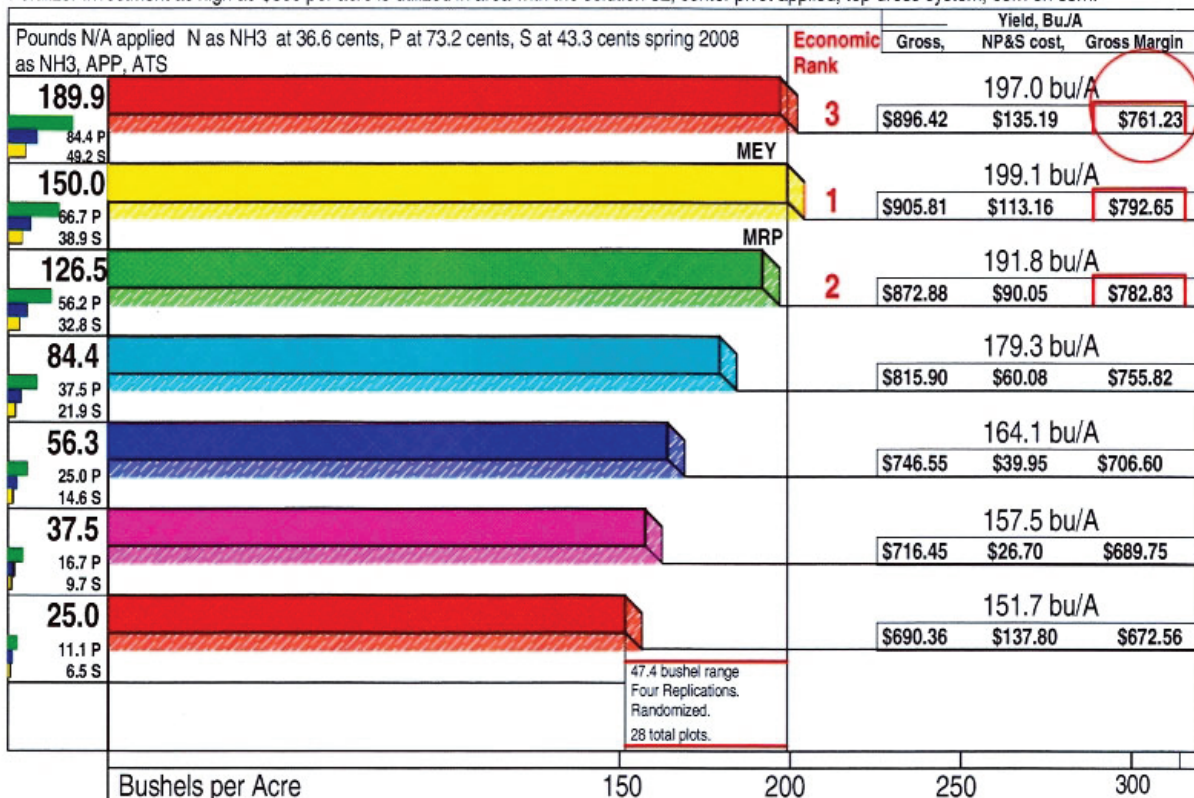
Best Returns came with 12% of the gross income invested in nutrients.

The Best Return....Exactrix reports that 12% of the gross is the typical best investment in fertilizer with a soil pH of 7 or greater.

TAPPS Formulator

Ortho Ratio 27-12-0-7S

Fertilizer Investment as high as \$300 per acre is utilized in area with the solution 32, center pivot applied, top dress system, corn on corn.



For the first time in the history of the Kramer Seed Farm the land has been fertilized exact. The streaming band width is exactly the same. Each band is identical within 1%. Every acre band is applied within 1%. The applied field rate is within 30 lbs. on 10,000 lbs. applied irregardless of temperature. The bands are not defused. The soil micro flora has difficulty accessing the uniform tight bands. The soil micro flora reject the bands as distasteful due to the acid base reaction. One of the secrets... streaming liquid flow with a standard band width that is non-diffused.



Exactrix test plots, randomized and replicated 3 times, measured with a scale, using an independent agronomist, produces a new understanding of nutrient efficiency.



Exactrix owners receive \$1000 for valuable nutrient management data. Results of test plots indicate nutrients are over applied.... Why? Non uniform application of the "old fashioned" metering systems and poor timing.

Wheat considered... Exactrix TAPPS No-tillage systems compared to tillage systems.



Annual No-till winter wheat.
Exactrix dual product TAPPS
Produced 80 bushels per acre over 2 years.



Contrasting Systems, Quinter, KS, 2006,
side by side comparison.
Economics visually explained.



Summer fallow winter wheat-tillage system
produced six bushels in two years.

Corn considered... Exactrix TAPPS No-tillage systems compared to tillage systems.



Annual No-till corn on winter wheat stubble of 2006 with Exactrix TAPPS rotational band loading. On the left pre-plant nutrients applied no-till with Exactrix Deere wing injection.



Contrasting Systems, Quinter, KS, 2007, Same two fields from 2006 in a side comparison.



The Exactrix owner was so proud of the decision to implement Exactrix technology. His pictures show the tremendous difference.

Lineal uniformity, band uniformity, chemical reaction, and physical state allows....and produces....a formulation of Tri-Ammonium Poly Phosphate Sulfate or TAPPS.

Typical 10% yield increases proven time after time in variable pH and variable OM soils.

Reduced use of N, P and S...Up to ½ the amount required compared to dry urea and dry P and S.

Chemical reaction

Formed at 800°F by super-ammoniation only with liquid NH₃ mixing APP and ATS. Acid base reaction.

Band uniformity

An all weather friend in liquid, low CV application at 1% variance. Dry fertilizer is not competitive.

Lineal uniformity

No sinusoidal flow...an uninterrupted flow of two liquid materials forming crystalline TAPPS.

Physical state-liquid state, high pressure at the injection point.

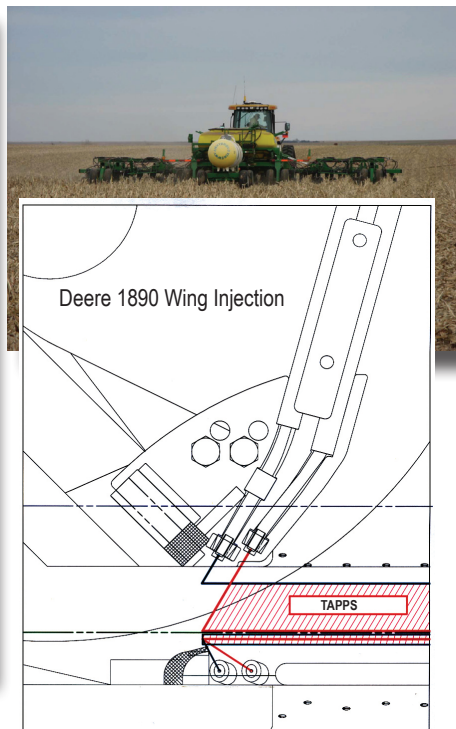
Unique to Exactrix...with process control, timed shut down, no freezing lines and assured mixing.

Nitrogen Stabilization.

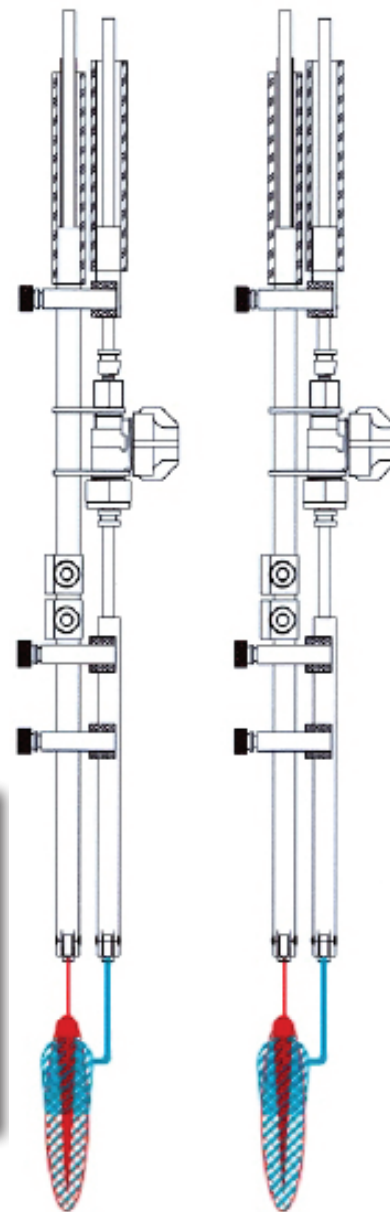
Ammonic Nitrogen is preferred by the growing crop. Thio-Sul completes the reaction and delays the conversion of NH₄ to mobile nitrate. The triple threat quarter back is Thio-Sul, which stabilizes N, solubilizes micro nutrients, and provides S and SO₄ for protein and oil content. Thio-Sul is Ammonium Thio-Sulfate.



Crystalline Tri-Ammonium Poly Phosphate Sulfate or TAPPS...A polymer with balanced homogenous mixing producing 166% more crop available and balanced nutrients. A major achievement following 35 years of development.



Critical mixing of the two materials below the ground line. Each wheat row feeds on a dedicated band in a balanced uniform blend of N, P, S, and Zn.



Each port outlet is within 1% CV allowing each corn row to feed evenly.

The reaction is at 800 degrees F as the NH₃ becomes NH₄ and forms Tri-Ammonium Poly Phosphate Sulfate.



A continuous streaming flow with no irregular band concentration allows the plant roots to access the nutrients without root pruning or burning. The homogenous blend polymer is crystallized in an acid based reaction. Uniformity and reaction result in 166% more crop available nutrient.

Technical Discussion, Tri-Ammonium Poly Phosphate Sulfate, TAPPS.

1. Can not be purchased....TAPPS is manufactured dynamically with an Exactrix Mid-Tech process control system.
2. The most plant available form of placed N, P, S and Zn.
3. Super ammoniation of a balanced nutrient package. Produces a hair root target 100 times greater diameter than a single product application of Ammonium Poly Phosphate, 10-34-0, 11-37-0, and ATS, 12-0-0-26S.
4. The crystals of TAPPS chemically reduces the ability of soil calcium to tie up or sequester placed P. Crystalline TAPPS remains available for future crops without tillage. Rotational Band Loading reduces P requirement.
5. Ammonium Poly Phosphate is required. Ammonium Thio-Sulfate is required. NH₃ is required. The three materials must mix and formulate with two intersecting streaming flow columns. The crystals must be formed.
6. Typically formulated as a 60-15-0-7S-1Zn. The three materials can be variable rate applied. N, P and S rates can be adjusted to match soil pH, soil available P and soil mobile SO₄. Zn ratio is no less the 18 to 1 in relation to P.
7. Known for 40 years to be the best method for fertilizing wheat and corn....and now it is practical.
8. Shifts the applied band pH to 8 to 8.5 allowing micro nutrients to become more available as band pH shifts in time from above 7 to below 7. Reduces the chances of hydrogen being stored in the soil. The plant can pull hydrogen directly. If timed properly the plant can directly pull NH₄ from the crystals of TAPPS. Thus reduced soil acidification potential. TAPPS delays the conversion to mobile nitrate.
9. Ammonium Thio-Sulfate or ATS is a nitrification inhibitor...and a plant nutrient. The cost to stabilize the band and reduce leaching is about half of other methods. ATS is listed as a plant nutrient and a nitrification inhibitor... NRCS approved.
10. Chevron Chemical, Ortho Division came close with the Unipel design...but no super-ammoniation and no pH shift, plus the sinusoidal flow of a dry prill when banded and high CV application port to port of dry fertilizer.
11. Exactrix test plots confirm that yield curves come up early and fast at low rates and then drop backwards when TAPPS is over-applied. See Exactrix Test Plot Summary. Yield limits are often related to other factors e.g. compaction, moisture infiltration, heat index at pollination.
12. TAPPS was pioneered at WSU, MSU, KSU and UNL....but never brought to a true state of perfection until recently at Exactrix with the help of the Fluid Fertilizer Foundation and Dr. Larry Murphy.



**Crystalline TAPPS Formulated
With Exactrix/Deere Wing Injection**



**Young farmers can expand their operation with Exactrix high speed tool bars.
Young farmers can save millions of dollars following Exactrix guidelines in
crop production. Risk is reduced and a 12% greater margin results.**

Agronomy Guide

Exactrix...Improving Production Economics, Improving The Environment And Reducing Risk.



166% More Crop Usable Nitrogen
200% More Crop Usable Phosphate
5% To 25% Nominal Yield Increases
Nitrogen Stabilization With Thio-Sul®
500% More Crop Available Zinc

Exactrix Is Producer Driven

Single Pass Planting, Low Soil Disturbance

Outstanding Production Economics

Net Dollars, \$30 To \$150 Per Acre With Less Risk

TAPPS, Phosphate Leads and Nitrogen & Sulphur Follows



Exactrix Process Management With Single Disc Openers Apply NH₃ And APP/ ATS At High Speed, Permitting No Tillage Farming



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

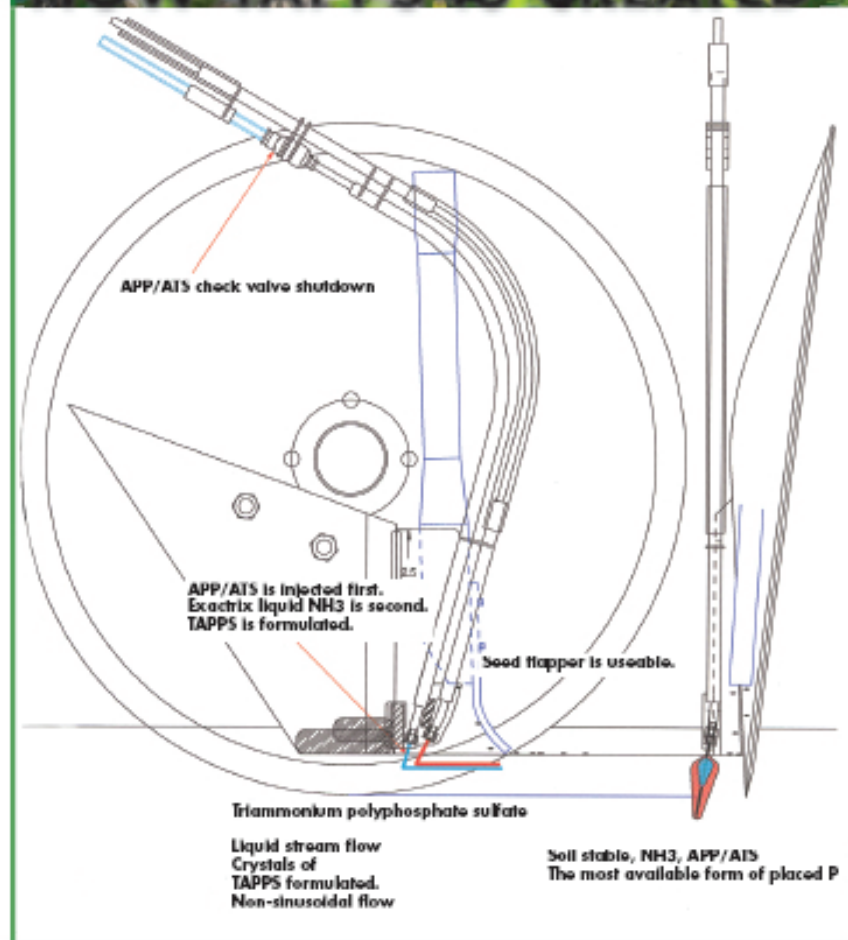
Bryce Naber, Albion, NE, started dual banding nine years and a couple of machines ago. "I don't think I really got the full benefit of double shooting until we switched to the TAPPS system," he says. "On corn following beans, we've cut our N rates to 130 to 140 lbs. and maintain yields of 200 to 250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

"On continuous corn ground, we preplant or side-dress 140 lbs. of N and follow that with another 30 lbs. of slow-release N mixed with postemerge 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."



HOW TAPPS IS CREATED



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 NH_3 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 NH_3 . 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 NH_3 , 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.

The last word in smart buys

> GOOD BUY

One-pass wonder

CLYDE COOK constructed this fertilizer/drill for the family Ririe, ID, wheat farm. He built a cart from a Yielder drill frame to carry a 3,000-gal. anhydrous tank, two 700-gal. liquid fertilizer tanks with an Exactrix TAPPS system, and a custom-built AgPro 10,000-lb. seed tank. A John Deere 1895 drill follows behind.

Cook bought a new Case IH Quadtrac 535 with second hydraulic pump to pull this massive one-pass rig.



CLYDE COOK still remembers helping his dad farm with a team of horses as a young boy. Today, he harnesses more than 500 hp with a Case Quadtrac 535 pulling the wheat drill and fertilizer applicator he built in his shop.

Cook builds equipment to suit his needs. "Manufacturers don't build a tow cart that will carry anhydrous ammonia, liquid fertilizer and seed," he says. "We wanted a compact unit to pull between the tractor and the drill that was heavy enough to do a lot of acres."

Cook is a partner in Lovell and Cook Partnership, which includes his son Brigham and brother-in-law Ron Lovell. The Ririe, ID, farm includes 6,000 acres of dryland wheat, irrigated wheat and potatoes. They no-till the dryland, continuous wheat acres, but the residue of 125- to 150-bu. irrigated wheat still requires some tillage.

Rig construction

"We used an old Yielder drill frame for the cart," Cook explains. "First we extended the axle so we could mount four 30.5x32 diamond tread flotation tires to reduce compaction. We also ran a 6x6 tube from just behind the ball hitch on the front of the Yielder frame to the back of the frame where a John Deere 1895 drill attaches with a pin hitch. Since the cart was going to carry more weight than the drill was originally designed for, we added some bridge trusses to reinforce it.

"It all tows very nicely," Cook says. "We can make 90-degree turns with no problems."

Cook mounted a 3,000-gal. anhydrous tank in the center of the cart and straddled

it with two 700-gal. poly tanks for liquid fertilizer. AgPro custom-built a 10,000-lb. seed tank with individual tubes for each row unit. "It's a little more cumbersome than using a seed manifold and it doesn't look quite as tidy," Cook says. "But it has a lot less variability in the seed row."

"The tank sizes were calculated based on how much product we needed to cover 165 to 170 acres using our standard fertilizer and seed rates," he adds.

An Exactrix TAPPS system delivers anhydrous and liquid fertilizer to brackets mounted on the front gang of fertilizer units on Cook's drill. "When we fall seed, we leave the front gang of openers mounted on 20-in. centers, like the factory set them," he explains. "We move the rear two gangs of seed openers to create a 7-13 paired row pattern that straddles the band of fertilizer. When we top-dress wheat in the spring, we add eight additional fertilizer openers to the front gang and narrow the spacing to 15 in."

The efficiency of dual banding with the Exactrix system has allowed Cook to cut fertilizer rates. "In the past we ap-

plied 180 to 200 units of nitrogen/acre and we've been able to reduce that to 130 units of nitrogen/acre without sacrificing yield. We may still reduce it some more," he says. "That was the driving force behind this new system. We used to use dry fertilizer. With the switch to anhydrous and reduced rates with dual banding, we're saving \$75/acre on input costs."

It takes about 65 gpm of hydraulic fluid to power the two hydraulic motors on the Exactrix system, the hydraulic motor for the seed fan, and the hydraulic power that maintains down pressure on all three gangs of openers on the drill. Cook special-ordered his Quadtrac with the TwinFlow option the company offers. With a second hydraulic pump installed on the tractor's hydraulic system, flow capacity increases to 94 gpm.

Better traction

In addition to the hydraulic capacity, Cook wanted the Quadtrac for its ability to handle "compaction and traction." "It has more horsepower than we really use most of the time," he says. "But when



A CASE IH Quadtrac 535 pulls the one-pass wonder that fertilizes and drills wheat seed.



we start seeding on fields with 12- to 15-degree slopes, that's when we need the power. The tracks give us the ability to plant steep slopes without losing traction. That tractor can pull the drill in places where a combine should never go."

Inside the tractor cab is a large bank of monitors and controllers to run all the technology Cook built into his drill. That includes an EZ-Steer unit to keep the train on the tracks. "We don't have good enough signals to use RTK in our hills," Cook says. "But this keeps us within less than a foot, which is adequate. We added an AgLeader monitor this year so we could map our fields and record our fertilizer application. This fall we'll move the monitor to the combine to create yield maps."

Of course it's easier to describe a machine like Cook's than to build it. The design and fabrication come with headaches. But, Cook admits, if he wasn't farming, he'd probably be designing farm equipment as a career. "Building this drill was a fun challenge," he says. "It's the kind of thing I like to do."

FIN

Photo: Robert Bower





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Apply up to 166% more crop usable Nitrogen
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Any soil opener can apply NH₃, APP, ATS with Exactrix Direct Injection Liquid NH₃ systems.

NH₃, 82-0-0, APP, Ammonium Poly Phosphate, 10-34-0, ATS, Ammonium Thio Sulfate, 12-0-0-26S.

The 2KC Weigh Master system has a Coriolis mass flowmeter that weighs the NH₃ as it is applied. Top outlet tank valve approved. Top outlet tank valves reduce application volume over bottom outlet valves. This means that the 2KC Weigh Master cannot apply as many gallons per day as the 2KD Weigh Master. The 2KC Weigh Master systems starts at 12 port arrangements. Dual manifold arrangements to 96 ports. The 2KC is rated to 24 gpm with twin tank, 1.5 in. top outlet valves. The 2KC is bottom outlet internal valve rated to 30 gpm.

Mass meter confirms total pounds applied within 30 lbs on 10,000 lbs. applied. Mass flow is the most accurate method to weigh NH₃. All applications are by weight. Totalizer readout allows the producer to change fields without weighing tanks. The totalizer readout is tamper proof.

The 2KD Weigh Master system starts at 12 port and goes to 96 port in dual manifold arrangements. This mass flow system weighs the NH₃ as it is applied. Applied field rates are within 0.3%. You can challenge the fertilizer dealer mechanical scales with this powerful metering and weighing system. The Coriolis mass flow meter has no moving wetted parts. Applied CV's are well below 1% port to port. The 2KD system is used by large farming operations. The 2KD has the lowest operating costs of all Exactrix systems using a sliding vane commercial pump. The Elite custody transfer system maintains accuracy within 0.1%. You can bill the customer or the landlord from the tractor seat. The 2KD system is bottom outlet approved to 72 gpm.

Consistently Higher Yields...10% to 20%...
as compared to other fertilizer types and methods.
TAPPS Formulators...Stabilized Nitrogen

Dual placement means 200% more crop available phosphate/sulfate with
Exactrix. Nitrogen stabilization results from TAPPS Formulation.

The 2KP systems start at 12 port & all the way to 96 port in dual manifold arrangements with Mid-Tech control. High port accuracy for dual placement. The Mini-Man manifold accurately delivers liquid APP and ATS at all flow rates with no orifice changes....forming the crystals of TAPPS. Low 1% CV delivery in port arrangements to match all tool bars and airseeders. Available with opener mounted check valves for sequential start-up and shutdown in dual placement NH₃, APP/ATS. The 2KP 308 has flows to 8 gpm. The 2KP 313 has flows to 13 gpm. Both systems have pressure ratings of 300 psi. Higher flow rates may require the 2KM TAPPS formulator.

The 2KM system allows for dual placement and formulation of Tri-Ammonium Phosphate Sulfate or TAPPS. Phosphate efficiency is increased 200% as compared to dry P application. The 2KM system starts at 12 port all the way to 96 port in dual manifold arrangement. The 2KM system dual product applies with the 2KC or 2KD Exactrix Direct Injection systems. Since line freezing does not occur TAPPS crystals can be formed. Very large filters assure tractor seat time with accuracy levels of sub 1% CV. Dual manifolds are used after 40 feet in width.

2KM systems have pressure ratings to 300 psi. Three flow ratings of 28 gpm, 38 gpm & 60 gpm, ...four flow meter choices, including mass flow reading specific gravity. Confirmation of each batch and critical analysis of nutrients is assured with Exactrix unique specific gravity readout. Specific Gravity is accurate to .002.

2KC

2KD

2KP

2KM

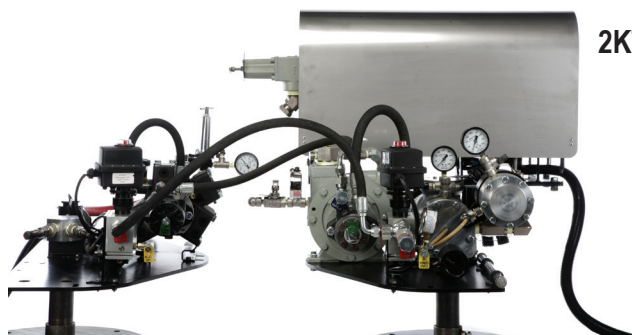


2KT

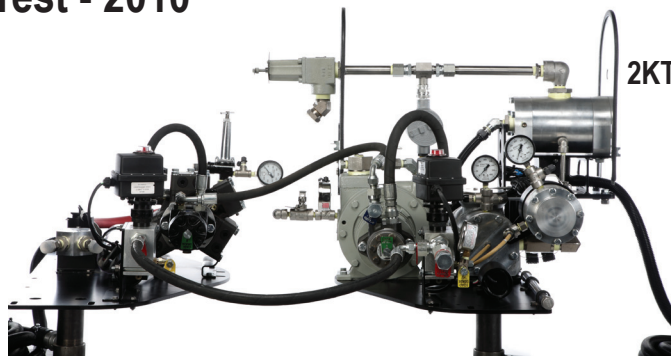


2KT

Final Test - 2010



2KTR



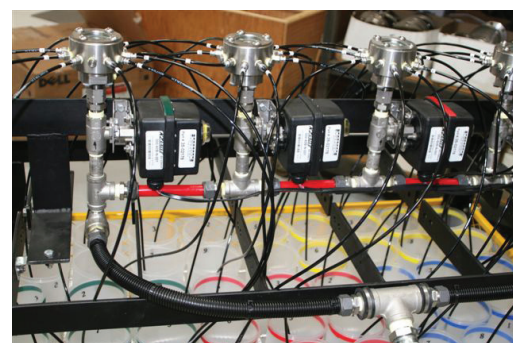
2KTR



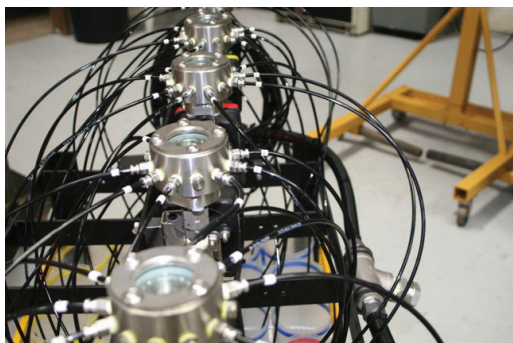
ISO-Bus for virtual terminal for dual products



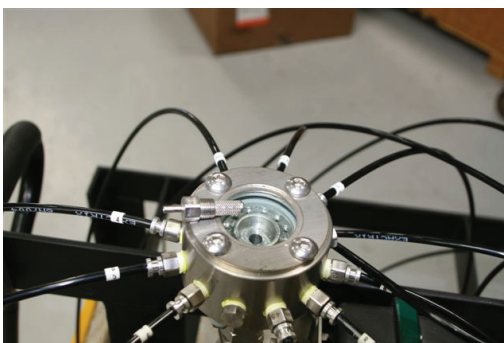
Auto Boom shutdown, ISO-Bus, TAPPS



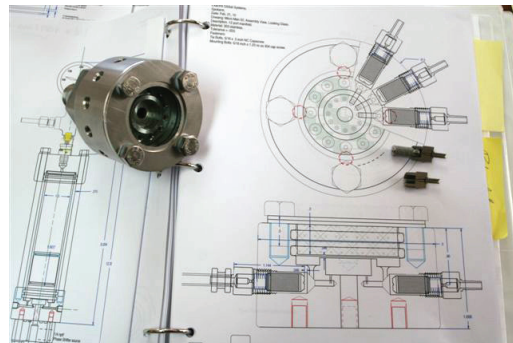
Looking Glass multiple manifolds



6 manifolds in Looking Glass release



Manifold orifice line filters



Engineer's view of Looking Glass & Micro Man



Micro Man manifolds from Looking Glass



P-51 Mustang



Case SDX Series 800, banding and seeding or banding

Agronomy Guide...THIO-SUL® Works



THIO-SUL®

THIO-SUL® 12-0-0+26S, (ammonium thiosulfate). THIO-SUL® is the original nitrogen-sulfur plant nutrient solution instrumental in unlocking the full potential of your fertility program. THIO-SUL® is a clear liquid containing 12% nitrogen (N) and 26% sulfur (S). THIO-SUL® is compatible with N solutions and complete (N-P-K) liquid blends, which are neutral to slightly acid in reaction. In addition to its wide adaptability for use in clear liquid blends, it is also well suited for use in suspensions.

THIO-SUL® aids in increasing crop yields and stretching your fertilizer dollars by improving and stabilizing the Nitrogen-Sulfur ratio. It helps in maintaining necessary sulfur levels in soils that are sulfur deficient.

THIO-SUL® helps solubilize and aids in plant assimilation of other essential plant nutrients such as phosphorus and increases plant utilization of several micronutrients, i.e., zinc, manganese, iron and copper.

Thiosulfate as a Sulfur Source. The advantage of thiosulfate, in comparison to other sulfur forms, is that the sulfur needed for plant growth becomes available over several weeks. Thiosulfate helps supply the plant's sulfur needs quicker than other sulfur forms.

THIO-SUL® as a Nitrogen Stabilizer. University research has shown THIO-SUL® can reduce potential losses associated with nitrate leaching and ammonia volatilization when blended with UAN solution resulting in more nitrogen being available to the crop. THIO-SUL®, when added to UAN solution at 10-20% volume to volume ratio, delays nitrification resulting in a decrease of potential losses from nitrate nitrogen leaching. In addition, when THIO-SUL® is added to UAN solution losses associated with ammonia volatilization may be reduced.

THIO-SUL® contains 1.32 pounds of nitrogen and 2.87 pounds of sulfur per gallon. THIO-SUL® weighs 11.05 pounds per gallon. Consult the THIO-SUL® application guide for rates and timing of application.



....for big producers. Track carts bring improved productivity and good returns.
Carts are commercially available through Exactrix.

