

GROWMARK FS Seedlings



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Rumentations By Ron Wilston, Dairy Nutrition Seed Specialist-GROWMARK FS

On December 16th and 17th, GROWMARK FS sponsored two forage quality conferences, in conjunction with Chr Hansen and Allied Seed. The meeting on December 16th was held at the Penn Stater, in State College, Pennsylvania, the other one was held on December 17th at The Inn On The Lake, in Canandaigua, New York. Both events hosted approximately 70 dairy producers, along with about 15 support staff from GROWMARK FS, Allied Seed and Chr Hansen as well as the speakers. The conferences featured four nationally and internationally known speakers: Dr. Don Huber – Emeritus Purdue University; Ev Thomas – Miner Institute; Dr. Dan Undersander – University of Wisconsin; and Dr. Lon Whitlow – North Carolina State University.

Based on the outstanding response of our customers in attendance, I would like to take this opportunity to recap the highlights of each speaker's discussion.

Dr. Don Huber's presentation focused on plant nutrition and its relationship to disease. Dr. Huber has spent 50 plus years researching the interaction between soil nutrients and plant disease and has co-authored a book called "Mineral Nutrition and Plant Disease." Dr. Huber discussed the following.

The form of nitrogen can influence disease occurrence through nitrification. Nitrification can increase disease such as stalk rot in corn. Dr. Huber went on to say that all attempts to stabilize nitrogen should be taken.

He also spoke on micro nutrient nutrition focusing mainly on manganese. According to Huber, manganese serves a big role in protecting plants from disease through the production of Coumarins, Flavonoids, and

Lignin. Manganese (Mn) is only available to a plant in the reduced form. Factors that decrease Mn uptake are numerous and include: high pH and high organic matter content in the soil; crop rotation; tillage; genetics; and glyphosate application.

Dr. Huber also explained the connection between glyphosate and Mn in plants. Glyphosate is a very strong chelator (binds things up). Glyphosate is systemic in plants and concentrates in the meristematic tissues (shoots, root tips and reproductive structures). It is distributed throughout the rhizosphere (top 3 to 4 inches of soil) in the root exudates. According to Dr. Huber glyphosate can persist in the soil and root residues for weeks, months or even years. He also claims that glyphosate is toxic to some soil microbes but stimulates others changing the balance in the soil. This change in soil microbe balance effects the availability of certain micro-nutrients such as Cu, Fe, K, Mn, N, and Zn. Glyphosate does not kill weeds itself, but instead interferes with the plants ability to defend itself from disease and it is the disease that actually kills the plant.

Dr. Huber summarized that with changes in technology, we have to look at issues of weed control and nutrient supply as a system, not as independent events. We have simplified weed control at the cost of possibly increasing disease and decreasing micro-nutrient uptake. We should increase the use of micronutrients in our fertility programs (mainly Mn and Zn) since we are tying them up in the soil when we are using glyphosate products for weed control.

Dr. Dan Undersander from the University of Wisconsin was the second speaker at both conferences. Dr. Undersander has dedicated his career to research on grazing, forage production and forage utilization and on near infrared reflectance (NIR) prediction of forage quality and other parameters. A summary of the presentation Dr. Undersander gave at the two days of conferences follows.

Dr. Undersander started out with new seeding recommendations and carried the process all the way to harvest and storage of hay or haylage. His new seeding recommendations were that the difference in the yield between newer advanced varieties and the older, lower yielding ones is so great that you can't afford to plant the older varieties, even if they are free. He showed three tons of dry matter per acre advantage from the average alfalfa in the trial to the top variety. Dr. Undersander also showed research which demonstrates that alfalfa stands should be turned over every three to four years to maximize yield. The extra yield will more than offset the cost of the new seeding. (He pointed out that the seeding year didn't count as a growing year.) Yields can also be increased by less frequent cuttings according to Dr. Undersander. In some Wisconsin data, he discussed that taking three cuttings before September 1st in Wisconsin resulted in a yield increase of 32% over taking four cuttings by September 1st.

He also discussed quality of forages. He stated that NDFd decreases about .4% per day past optimal cutting (bud stage). Along with decreases in NDFd, Relative Feed Value or RFV decreases points per day as well. Grasses are more prone to quicker drops in quality than alfalfa.

He summarized the first part of his presentation by saying you need to balance between yield and quality when managing forages. If you are feeding high producing dairy cattle, you have to cut early to achieve the quality, but if you are feeding beef cattle, heifers, dry cows, etc., where quality doesn't have to be as good, then cut later and get higher yields.

The second part of Dr. Undersander's presentation focused on harvest and preservation of forages. He put a lot of emphasis on minimizing losses during harvest. Here are some of the things he recommends:

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mow in a wide swath to decrease drying time; select mowers that have conditioners that are at least 60% of the width of the cutting area and ideally 80%; watch out for mowers that are only 30 to 40% of the width of the cutting surface. Dr. Undersander contends that flail conditioners are for grass because they break the waxy coating on them, but knock off too many leaves to be used on alfalfa. Mowers with conditioner rollers work better on alfalfa because of less leaf loss, but won't dry grass as fast because they do little to break the waxy coating on them. Hay and haylage lose the first 20% of their moisture due to respiration and evaporation not due to conditioner rollers. The first rule of hay drying is that the thinner the swath, the faster it dries due to lower internal humidity and increases in surface area. The leaf loss from raking increases as the moisture decreases. Dr. Undersander does not promote the use of wheel rakes as they increase ash content of the forage due to the great amount of ground contact from this style of rake. He further explained ash content as the measure of both internal minerals contained in the plant structure (Ca, Mg, P, K etc.) and external minerals, ie. the dirt and other contaminants that are picked up with the forage.

He sites this quote from Pat Hoffman. "While there have been few dairy research trials in this area, it is highly likely that cows do not milk well when fed dirt."

Dr. Undersander finished up by going over a few basics of harvest management. Harvest at the proper moisture: haylage 55-65%; dry hay 14 to 20% depending on the bale size; Remember that heat damage from improper moisture, packing and storage can reduce TDN (Total Digestible Nutrients) as well as protein; and he suggested using a good University proven inoculant for hay crop silage and buffered propionic acid for dry baled hay.

Ev Thomas of The William H. Miner Agricultural Research Institute spoke next. Thomas' presentation focused on Corn Silage and Preservation. He reminded us that: Corn Silage is two crops, a high quality grain and a fair quality tropical grass. A good ear is good crop insurance. The ideal maturity is AT LEAST 30% dry matter, and maximum yield and maximum milk production occur at 35% dry matter. Thomas suggested using dry matter content to assess maturity and to use a koster tester or microwave with a postage scale to determine dry matter - then subtract 2 points. An example is: if the koster reading says 30% dry matter the field moisture will be 28%. Thomas really pushed the use of silage inoculants saying, "Silage inoculants should be

a part of every farm's risk management strategy" and that "the cost : benefit ratio favors applying an inoculant to every crop, every year." He also made the point not to use L. Buchneri inoculants on silage that is less than 30% because this will produce an undesirable amount of acetic acid.

The last area Thomas talked about was harvest. He said that you must match your rate of incoming material to the packing rate. The old rule of thumb: Tractor weight divided by 800 = fill rate in tons per hour, or you can go to the Kansas State web site where you will find a calculator to help you determine tractor weights and fill rates. "The progressive wedge may not be way to fill small bunker silos," says Thomas. There may not be space on the ramp to spread a truck load of silage the recommended 6" or less depth.

Thomas also shared that drive over piles may be cheaper than bunks, but also take up more space and the sides of the pile should not be greater than a 30 degree slope to ensure good packing.

The last speaker was Dr. Lon Whitlow, Professor of Nutrition and Animal Science, North Carolina State University. Dr. Whitlow has focused his research on mycotoxins showing they routinely occur in a variety of feedstuffs, including silages.

Dr. Whitlow shared that mycotoxins are produced in feeds from the fields to feeding. This occurs through pre-harvest contamination, excessive moisture in "dry feeds", moisture migration and hot spots from temperature and lack of aeration. Other factors include high fine contents, rodents and insects, aeration of wet feeds, and mismanagement of feeding equipment, silage feeding face and feed bunks.

"Mycotoxin concerns have increased over time," Dr Whitlow said. Agronomic practices and changes in weather patterns seem to have had an effect. The methods for testing have gotten better, cheaper, and faster, raising the awareness of the problem. The higher producing dairy animals today also are more susceptible because of the low ruminal mycotoxin degradation caused by higher grain diets that cause lower ruminal pH. This lower pH environment is less conducive to the protozoa that can help degrade mycotoxins in the rumen. Mycotoxins can have major effects on cows through increased stress, reduced feed intake, and reduced nutrition of the animals. The nutrient content of moldy feed is lower, the nutrient absorption is reduced and metabolism blocked or altered. Other ways mycotoxins affect dairy cows according to Dr. Whitlow are by:

antibiotic effect on rumen micro flora; suppression of immunity; the estrogenic effects of zearalenone on reproduction; cellular death; and systemic toxicity.

Dr. Whitlow claims that dairy cattle being fed mycotoxin contaminated feed need higher levels of protein because mycotoxins interfere with protein synthesis. Even dairy cattle fed low levels of DON produced less milk. In one study, cows consistently being fed just 2.5 ppm of DON produced 3.2% less milk than the control cows.

Dr. Whitlow also gave the audience some reminders on ways to help prevent mycotoxins.

1. Reduce the field contamination through crop rotation and cropping practices.
2. Reduce mold in stored feed through better silage management (inoculants) and better dry feed management through keeping moisture out.
3. Reduce cow stress by ensuring clean feed, especially for dry cows, pre-fresh, and fresh cows.
4. Spray bunker faces that have been problematic with propionic acid to prevent mold growth.

Lastly, Dr. Whitlow covered the diagnosis and treatment of mycotoxins. Diagnosis should start with observing for general symptoms of poor performance and disease. Use the process of elimination to rule out other possible causes such as nutrition, disease and management. Add mycotoxin binders to the feed and observe animal behavior to see if there is any improvement. Test feeds for common mycotoxins (DON, T2, Zen, FB, AF). Test for amount and type of mold. When it comes to treatment, Dr. Whitlow recommends the following: remove or dilute contaminated feeds; change feed handling to reduce mold; and add mold inhibitors. Other suggestions Dr. Whitlow had were to stimulate feed intake; add nutrients such as antioxidants: Vit. E, Cu, Zn, Mn, Se, Vit. A/carotene and extra protein, fat, and adequate fiber; enhance rumen fermentation (buffers and microbials); and deactivate the mycotoxins through binders and absorbents.

As you can tell, the information presented was outstanding and was well received by the customers in attendance. GROWMARK FS would like to thank all the speakers and attendees and we look forward to providing more outstanding information at the next Forage Quality Conference. Please be sure to let your local salesperson know if you would like to be invited to the next event. We are sure you'll find the information worthwhile.

Ron



Manufactured by Precision Planting. Brought to you by GROWMARK FS.

It's been almost 35 years since Dad let me plant my first acre of corn. I remember that warm spring evening as if it were yesterday. The sun was setting and made it difficult to see when looking over my shoulder as we planted away or drove into the glare. "Don't be look'n back at the planter" barked the boss, "If you're gonna plant straight, you must have forward vision and focus. The planter will still be behind ya when you lift out at the headland. At that point, after your turn, then glance over at the last pass and see that there's seed and fertilizer dropped in all 4 rows before you strike out again. That's how you monitor the planting and avoid costly mistakes..." Yes Sir! I have been attempting to plant straight ever since... So much for 20/20 hindsight?

Now let's fast forward into the 21st century. Greg Sauder, Illinois farmer and owner of Precision Planting says; "Measure, Manage and Control. We can't manage what we fail to measure. We need to identify problems and find solutions now, on planting day before causing a profit robbing train wreck measured on harvest day." Enter the vision behind 20/20 Seed Sense Monitor; a revolutionary planter diagnostic tool integrating GPS technology with agronomic software capability. Consider this: You've spent hours over the winter getting the planter "READY". The meters were sent to a designated Precision Meter-Max test stand, tweaked, fine-tuned and upgraded with Precision parts or new meters via a skilled and trained Precision certified technician. [Note* - GROWMARK FS is the largest sales/service and applied technical information resource provider and distributor for Precision Planting in the Northeast.] An accuracy level of 99%+ is the potential of a Precision meter off the test stand or out of the box. You've researched and selected the correct genetics and trait technologies matched to your operation, management and goals. You've worked on crop planners taking account for crop protection, fertility, fuel and labor inputs. You have done everything within your control to maximize high yields and risk management; Is that right? Absolutely not - if 20/20 Seed Sense isn't in the equation. Any planter will put seed in the ground. A good planter will place the right amount of seed, accurately spaced at the correct depth. A great planter also places the seed in the correct soil environment, and allows you to monitor it all in real time as it happens. Let's

dig a bit deeper...

Envision a diagnostic Meter-Max test stand, a computer and software system with agronomic information and record keeping (remote PC interface capable) a GPS mapping system and an individual row planter unit down force on the fly management system - all encompassed within an easy to operate and install 8.5" planting monitor mounted in your cab. It's called 20/20 Seed Sense. This advanced monitor system provides growers with a very user-friendly touch pad screen. Simply touch any area of the display to bring up a second level screen delivering row by row details. A bar graph shows each row's skips and doubles. Green background indicates all is within the tolerances you can pre-set. Yellow and red mean there is a problem. Touch any of the row bars to bring up a screen showing all the details of a single row. See the corn coming out of the planter with every error identified. It also simultaneously demonstrates; Population: 20/20 provides the most accurate population reports alerting to high and low row performance. Singulation: Identifies each row's singulation score. Skips and doubles: dial in perfection once you know the type of singulation errors that are happening in real time. Monitor average skips and doubles looking at performance for each row. Good spacing: instead of a calculated average spacing that is displayed on standard monitors, 20/20 reports the percent of seeds that are perfectly spaced. The good spacing score reflects the singulated seeds and misplaced seeds (not skips or doubles). It measures the distance (or deviation) between each seed to determine if they are close enough to cause an economic loss. If so, good spacing score drops. Down Force: never before could you get an accurate measure of the pounds of down pressure so you can adjust for changing tillage, moisture and soil conditions. And, introduced this year is the 20/20 AirForce system which works in concert with the 20/20 Seed Sense monitor's measurement of ground contact and total row unit weight. It automatically makes the adjustments within seconds on the fly, required for constant ideal downforce, regardless of soil conditions. Ground Contact: Monitor the percent of time that the gauge wheels are carrying weight demonstrating excessive pressure on the seed trench sidewall compaction, or if the row unit is losing

depth. Margin: a measurement of the weight in reserve (or in the bank account) available for use to maintain 100% ground contact and seed depth. Speed: a built-in GPS receiver provides speed information allowing for the most accurate calculations of acres, spacing and population. Good Ride: accelerometers are mounted on row units to measure row bounce. This information is translated into a smooth ride score. This score becomes a "barometer" for ground speed. As long as your ride is smooth, and singulation and spacing are ok, you can speed up with the confidence it's not costing yield! Economic loss: instantly see the impact of planter management decisions made (or not made) regarding excessive speed, failure to add talc or graphite's impact on seed release, improper brush adjustment, drive chain tension or wear, drive wheel slip or air pressure and many others. This display gets you out of the cab to fix the problem.

The entire 20/20 Seed Sense system includes the monitor, a processor module (Smart connector) that mounts between the existing 37 pin connector on the planter's existing wiring harness, three row unit modules (accelerometers) that mount on one row unit on each section of the planter, three down force gauge sensors (smart pins) that mount between the gauge wheels on the same row units as the R.U.M. and a GPS receiver puck cab mount. On many planters, use your existing sensors and wiring harness. It all connects to the tractors 12 volt system. The entire process can be accomplished within two hours. There is no other monitor available today that can measure, manage and control your planting dynamic as 20/20 Seed Sense.

But how can we measure the value in dollars for adaptation of this technology? Let's dig a bit deeper.

With GROWMARK FS and Precision Planting, our goal is to help you find profit via excellent products, applied technologies, and consultative management expertise. Your goals must be to maximize yield, capture efficiencies and manage risks. You have little control over market price or cost of inputs. With corn production you need to manage toward achieving a picket fence stand. You need to farm for the ears per acre not just the population. A skip or double deviation planted in a 1/1000 acre row configuration, (17 ft. 5 in. on 30 in. row space) can equate up to 7 bu.

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20/20 Seed Sense Monitor, *continued*

Obviously there is no ear on a skip, and a double plant acts like a weed or sucker plant with diminished potential. There are approximately 148 ears in a bushel. Thus capturing just one aforementioned deviation with Precision Planting can equate to $1000/148=6.75$ bu advantage per acre! Our goal is to find 2000 additional ears per acre via Precision manipulation of your planting configuration. That's 14 more bushels or a couple of ton of corn silage without manipulating your other fixed and already budgeted input costs. $14 \text{ bu} \times \$3.50 \sim \49.00 per acre $2 \text{ ton silage} @ \$35.00 = \70.00 That's just spacing and singulation. What about seed trench placement, down force manipulation and control via changing row unit weight, tillage, soil moisture and type? What happens with excessive down force? The side walls of the seed trench can become compacted. Those new roots should be free to move out at 90 degree angles to the trench wall. Excessive down force creates an environment where the roots are forced down the seed trench, not out through the side wall. We refer to this as "hatchet rooting." This means roots are slower to reach starter

fertilizers; air pockets can form over seeds, reducing seed to soil contact. Uneven stands develop from slow germinators, soil cracking occurs over the row, and the less drought tolerant root systems will impact yield and profit. Research has demonstrated the cost of improper down force via uneven germination and ear girth equating to \$30.00 per acre. What about too little down force? What are the costs of shallow or unplanted seeds? These are just a few agronomic measurements which you can not control or measure without 20/20 seed sense. We are only scratching the surface here to exemplify the payback potential of this technology even with small planters and acreages.

Last year GROWMARK's smallest installation of a complete Precisionized planter makeover including the 20/20 Seed Sense system went on a 4 row JD 7000 planter. The grower wasn't concerned about the return on investment. "It's a no-brainer," he stated. Satisfied customers will speak the truth. Last year, 97.2% of folks that placed the 20/20 in their cabs said they'd recommend the technology to a neighbor. Another



comment we heard often was the "relaxation factor" that came with taking the guess work out and putting control into the equation. "I slept better at night!"

Folks, we must farm to the max in the 21st century or we will fail to compete and succeed. With the GROWMARK FS / Precision Planting partnership and technology such as 20/20 Seed Sense; together we'll meet the challenge. Like Dad said some 35 years back; "If you're gonna plant straight, you must have forward vision and focus. That's how to monitor the planting and avoid costly mistakes." Yes Sir! And 20/20 hind sight doesn't hurt either!

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