AG ALERT

NDSU EXTENSION SERVICE GRIGGS COUNTY

Issue #8

Thursday, June 23, 2016

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Rainfall and Growing Degree Days (GDD)

Location	Cooperstown	Finley	McHenry	Pillsbury
Barley/Wheat GDD (Plant date: 4/15/2016)	1737	1719	1650	1737
Compared to 2015	170	126	78	144
Corn GDD (Plant date: 5/1/2016)	712	675	619	711
Compared to 2015	145	112	76	150
Rain Since 4/15/2016	9.55	7.77	8.67	7.48

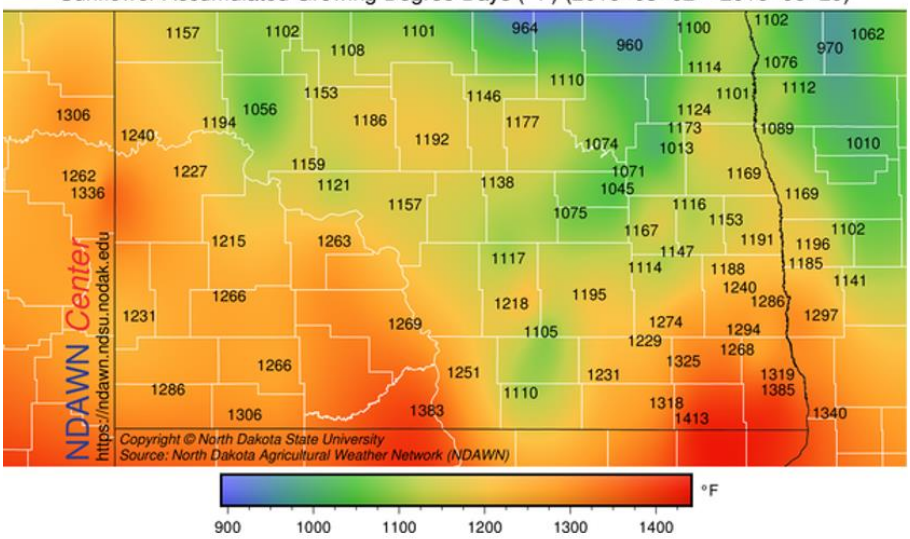
Note: Actual rain amounts may vary.

LEAFY SPURGE UPDATE FLEA BEETLE UPDATE

Accumulated growing degree days (AGDD) from NDAWN (**sunflower degree days/growth stage application**) indicated that leafy spurge flea beetles are getting close to 1,200 when f**lea beetles should be collected between 1,200 and 1,600 AGDD.** Currently, North Dakota ranges from 964 AGDD in the northeast to 1,413 AGDD in the southeast (see map below). After late July (or 1,600 AGDD), flea beetles begin to lay eggs and should not be moved or collected.

Accumulated Growing Degree Days for Leafy Spurge Flea Beetles as of 06-20-2016, NDAWN.

Sunflower Accumulated Growing Degree Days (°F) (2016–03–02 – 2016–06–20)



WEATHER

Weather Forecast: June 23 – June 29

The "heat ridge" over the southwestern portion of the United States will generally remain in place over this forecast period. This will mean that the weather over the next week in our region will in many ways be similar to what we experienced this past week. Occasional thunderstorm threats and fluctuating temperatures from day to day.

The temperatures will warm up as we approach the weekend, with cooler weather than projected into early next week. The warm up this weekend will be associated with an area of low pressure that will move across the northern plains. That storm system will draw in a day or two of warm weather, followed by a distinct cold front that will draw in much cooler air for early next week

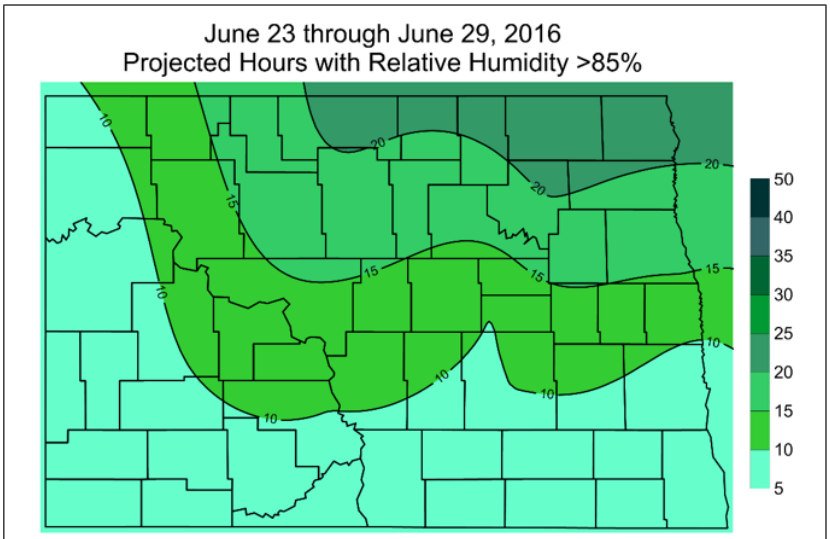


Figure 1. Projected number of Hours with Relative Humidity above 85% from June 23 through June 29, 2016

The main thunderstorm periods look to be Friday Night into Saturday morning, then Saturday Night into Sunday morning. That would be fewer chances than other seven day periods in the past month. Estimated relative humidity (RH) hours are given in Figure 1. Frequent west/northwest wind will keep RH values down in this period. Also, the projected Growing Degree Days (GDDs), base 34°, 44° and 50° for the period June 23 through June 29, 2016 are presented in Figure 2.

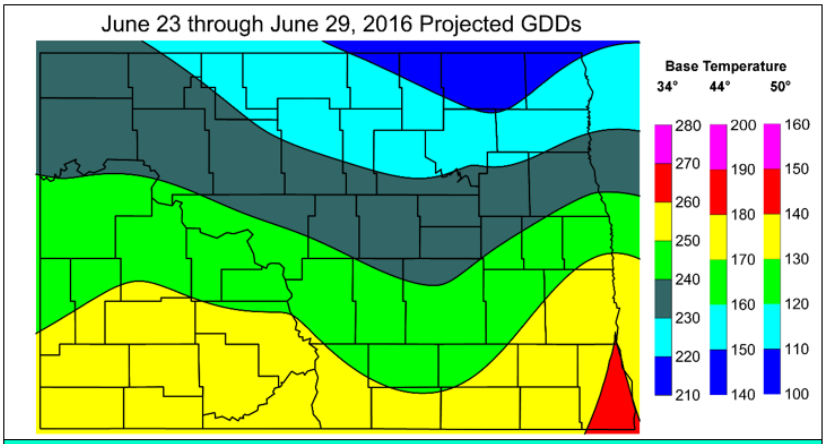


Figure 2. Projected Growing Degree Days from June 23 through June 29, 2016

Daryl Ritchison
Assistant State Climatologist/Meteorologist
Forecast Blog: ndsu.edu/ndawnblog
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ENTOMOLOGY

Apiary and Sensitive Site Database and Map Available

For years, applicators, bee keepers, organic growers, and vineyard enthusiasts have struggled with pesticide drift incidents. Bee kills, loss of organic certification, and grape injury have led to costly complaint investigations, expensive lawsuits, hard feelings, and even bankruptcies of farms and businesses. In almost all cases, good communication and accurate mapping would have gone a long ways to avoiding the problem in the first place.

While online lists, registries, database, and mapping systems have been around for the last several years, the North Dakota Department of Agriculture has integrated all these approaches, plus an automated alert system into their latest, "***Apiary and Sensitive Site Database***".

If you are a pesticide applicator you can register an area where you are going to be applying pesticides and receive alerts regarding sensitive locations in your designated area. If you are a bee keeper, organic grower, etc., you can register your sensitive site(s) and you can also receive alerts for watch areas of pesticide treatments.

The system has evolved over the years from nothing more than a simple list of names with contact information, into a useful and interactive mapping and alert system tool. Check it out and create an on-line account to register your application territory or sensitive site.

Go to: **https://beemap.ndda.nd.gov**. For questions concerning the database and mapping system, contact State Apiary Inspector Samantha Brunner at (701) 328-2240 or **sbrunner@nd.gov**

For information on pesticide use issues and North Dakota's Pollinator Protection Plan, go to:**https://www.nd.gov/ndda/files/resource/ND_Pollinator_Plan_2016.pdf** and/or the department's Outreach Specialist, Jeremiah Lien at (800) 242-7535 or **jjlien@nd.gov**.

Andrew A. Thostenson
Pesticide Program Specialist

Invasive Insect Watch

If you see any of these insects, please contact your local county extension office, the North Dakota Department of Agriculture or one of the authors listed below. Thank you.

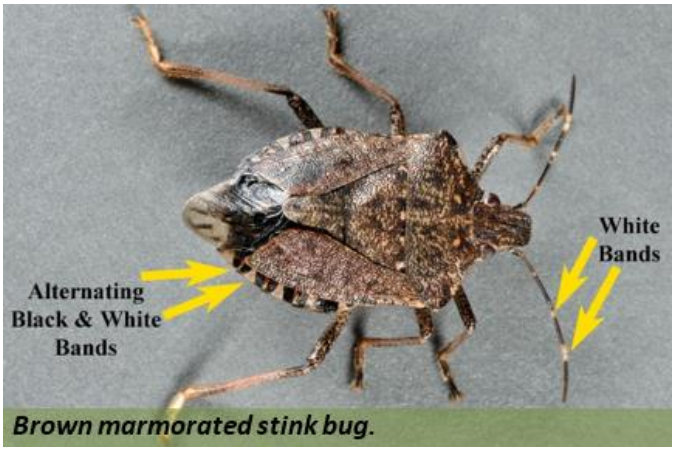
Japanese Beetle (JB), is an invasive insect native to Japan that was discovered in the eastern USA in 1916. Since that time it has slowly spread west. JB has been found in low numbers in North Dakota each year since 2012. The large ½" metallic green beetle with bronze wing-coverings attacks a broad range of host materials including turf grasses (larva), field crops (corn and soybeans), and 300+ species of ornamentals. ND Dept. of Agriculture is conducting trapping surveys to help determine how widespread JB populations are in ND. JB has been caught in 12 counties in ND, with three counties believed to have small established populations (Burleigh, Grand Forks, and Cass counties). See NDSU Extension Service fact sheet E1631 ***IPM of Japanese Beetle in ND*** for more info.

Adult Japanese beetle (Photo C. Elhard, NDDA)

Adult Emerald Ash Borer (Photo G. Fauske, NDSU)

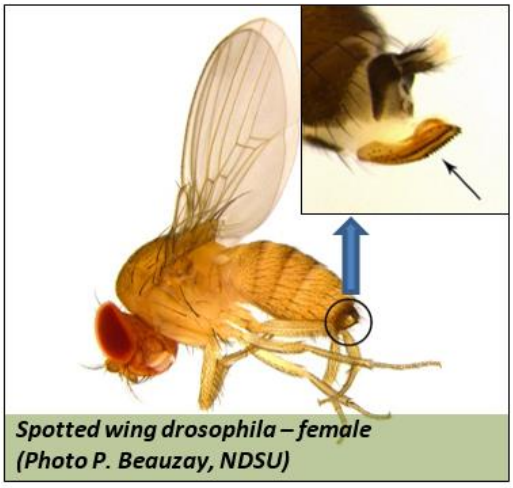
Emerald Ash Borer (EAB) is an invasive pest from Asia that feeds on ash trees (*Fraxinus* spp.). Likely introduced via wood packing material in the late 1990s, the beetle has been found in 27 states including 12 counties in neighboring Minnesota. EAB has not yet been found in North Dakota. EAB has killed tens of millions of ash trees across the country, and is spread through the movement of infested nursery stock and firewood. Adult beetles are 1/2" long with a metallic green body. The larva damage the conductive tissue under the bark, restricting the trees ability to move nutrients. USDA-APHIS-PPQ is conducting a trapping survey in uninfested states. See NDSU Extension fact sheet E1634 ***EAB: Biology and IPM in ND*** for more info.

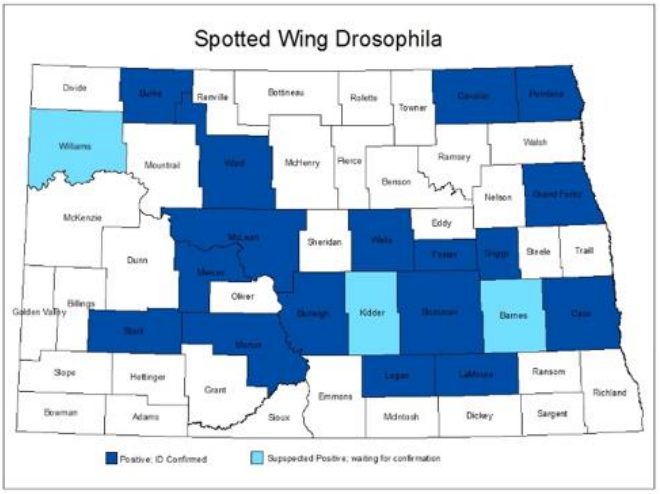
Brown Marmorated stink bug (BMSB) has not been found in North Dakota yet, but it is in neighboring states – eastern Minnesota and Iowa. This is a large stink bug (¾ inch long by ⅜ inch wide) and could become a pest of soybean, dry bean and field corn. Adults and nymphs damage developing seeds by injecting a toxin into the seed resulting in deformed seeds. In the fall, these stink bugs have a bad habit of trying to get into homes, just like the box elder bug. Identification is based on white band on antennae and alternating black & white banded on edge of abdomen. We are participating in a NC Soybean Research Program multistate project and surveying for BMSB in soybean fields in eastern ND this year.



Brown marmorated stink bug.

Spotted wing drosophila (SWD), is an invasive insect pest of small fruit believed to have originated from Asia. First discovered in North Dakota (ND) on tart cherry in 2013, SWD has spread quickly into 17 counties of ND. Female flies attack fresh and ripening fruits rather than the rotting fruits that similar vinegar flies prefer. Female have a serrated egg-laying apparatus (see photograph below) that she uses to lay eggs in unripe fruits. SWD has been confirmed infesting a number of fruit crops in ND, including blackberry, Juneberry, raspberry, tart cherry and grape. See NDSU Extension fact sheet E1715 ***IPM of SWD in ND*** for more info.


Spotted wing drosophila – female (Photo P. Beauzay, NDSU)



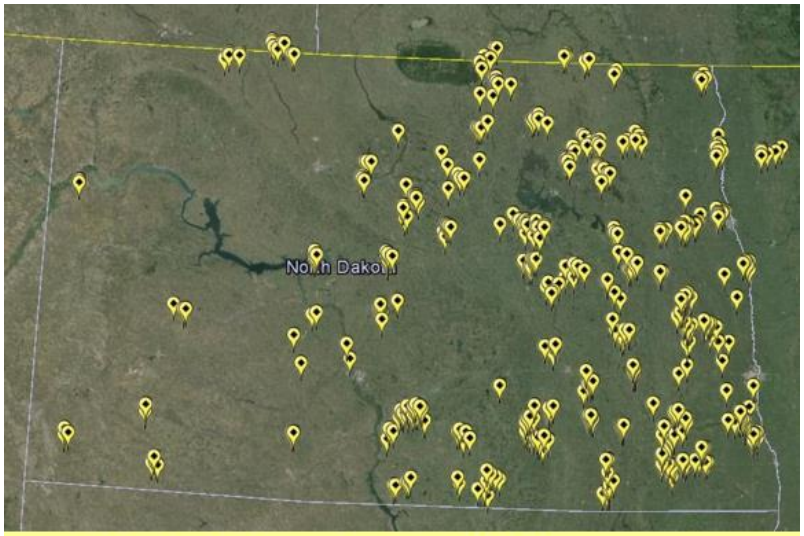
Charles Elhard
Plant Industries, ND Dept. of Ag

Janet J. Knodel
Extension Entomologist

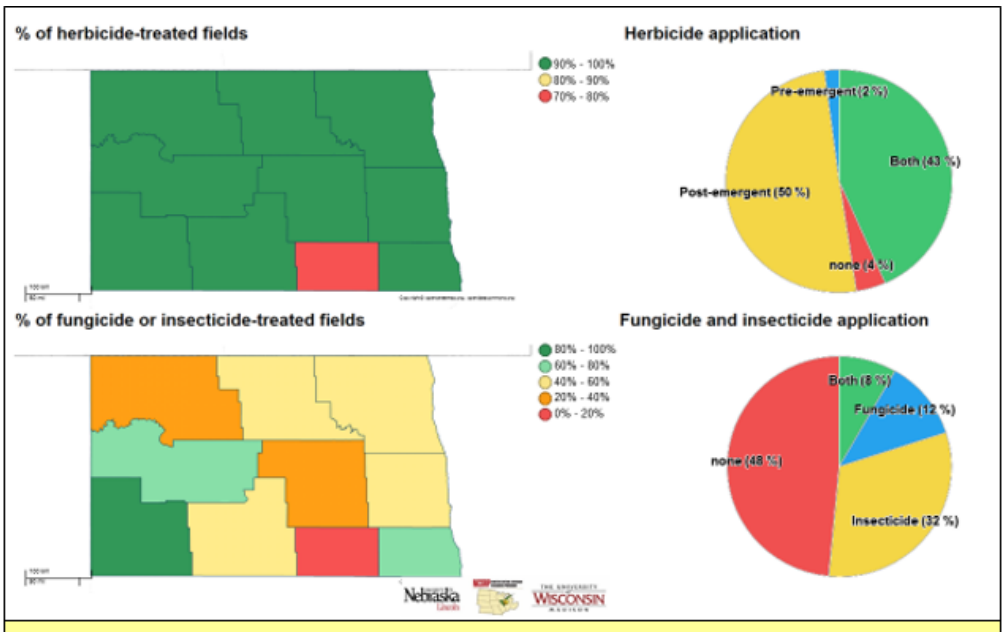
PLANT SCIENCE

Soybean Scouting

A soybean survey project, called Benchmarking Soybean Production Systems in the North-Central USA, started during this past winter with questionnaires filled out by participating growers. The survey is part of a multi-state effort to evaluate what growers can do to improve soybean yields. Growers reported about their management of various soybean fields to provide data for this project. Graph 1 is indicating the distribution of the collected data. Throughout this summer, producers are providing information about their 2016 soybean field management and their fields are evaluated for established stand, nodulation, weed pressure, pests and diseases. The summer evaluation data is then compared to yield information provided by the producer after harvest.



Graph 1. Soybean field survey locations 2014-2015.



Graph 2. Percent of fields treated with herbicides, fungicides and insecticides and type of application, combined data collected from 2014-15, source Dr. Edreira.

Graph 2 indicates that about half of the surveyed growers utilized post emergence herbicide strategies, whereas 43% of the growers utilized both pre- and post-emergence herbicides to control weeds.

The second part of the graph indicates that 40% of the growers used insecticides, most likely to control soybean aphids and that 20% of the growers used fungicides. Decisions on use of pesticides should be based on the presence of insects or disease at threshold levels. Numerous studies, including data presented in Table 1, concluded that in the absence of

disease, fungicide application may not increase yield. Due to the cost of the chemical and application, unnecessary use of pesticides may result in a lower net income per acre.

For the 2016 summer field observations, soybean roots are evaluated for nodulation (biological fixation of nitrogen) and other issues. Some roots show the presence of soybean cyst nematode as indicated with arrows in photo 1. Producers and consultants are encouraged to note if plants have cysts in order to prevent future yield loss by properly managing the soybean fields in the future. Management includes selecting tolerant soybean varieties, crop rotation with a non-host crop, and preventing the introduction of soybean cyst nematode into production fields.

Table 1. Plant density, vigor, height, test weight and yield for treatments across[1] water management, varieties, and years (2014-2015) at Fargo, ND.

Seed treatment	Other inputs	Plant density	Vigor scale 1-9	Height	Test Weight	Yield
		Plants/ acre	9 most vigorous	--cm--	lb/bu	bu/a
No	None	180,489	5.5	54.9	59.2	49.6
Yes	None	187,917	5.7	56.2	59.6	51.2
Yes	Foliar Fungicide	189,992	5.6	55.0	59.4	50.4
Trial Mean		187,962	5.8	56.6	59.5	51.7
CV %		19.7	16.3	8.6	1.2	6.2
LSD 0.10		NS	NS	NS	0.3	1.3

[1]Numbers in the table are based on 32 observations.

We are currently seeking 2016 soybean fields to evaluate this summer as part of this project to improve soybean yields in North Dakota. If you are interested, contact J Stanley at **j.stanley@ndsu.edu**.

Photo 1. Soybean root with nodules and soybean cyst nematodes (near arrows). The adult female is lemon-shaped. The body of the female protrudes outside of the root. Picture taken June 17, 2016, Cass County.

Hans Kandel
Extension Agronomist Broadleaf Crops
J Stanley
Soybean Survey Coordinator

Small Grain and Corn Development Ahead of Normal this Season

During my recent travels and based on reports from Area Specialists and County Agents, field conditions vary considerably across the state this season. In the northeast, excessive moisture has delayed or precluded planting and delayed getting into to the field for timely chemical applications. In other parts of the state, plants are starting to show signs of stress due to the lack of moisture. In the southeast, this has been one of the few seasons in recent memory when there have not been huge losses of nitrogen due to denitrification and leaching associated with excessive rainfall. In some fields, rainfall is sorely needed.

One feature of this season that has impacted the crops throughout the state uniformly is that of warmer than normal temperatures. Growing degree day accumulations for both wheat and corn are running well ahead of normal (about 8% for wheat and 20% for corn), last year and the average of the last five years.

Wheat and corn growing degree day accumulations (assuming a 1 May planting date) for the 2016 season and departures from normal, 2015 and the average of the last five seasons.

		Wheat					Corn		
Location		Departure From					Departure From		
	2016	Normal	2015	5 yr. ave		2016	Normal	2015	5 yr. ave
Carrington	1379	30	151	133		619	63	105	107
Dickinson	1393	181	183	184		651	153	179	172
Langdon	1340	180	193	181		433	136	103	128
Prosper	1495	101	187	111		729	138	153	111

This means that crop development is substantially ahead of normal (this is borne out in the most recent USDA-NASS Crop Progress Reports). Additionally, since the yield potential development of small grains is favored by cooler weather, this also means at this point, our yield potential may not be as high as in recent years. Hot temperatures accelerate development usually at the expense of yield potential (smaller spikes and fewer tillers). Given the tremendous adaptive capacity of small grains, however, there is still opportunity for high yields if conditions are favorable during grain filling (i.e. larger kernels and/or more fertile kernels per spikelet). Reduced growth during hot temperature can partially be explained by reduced net photosynthesis; the optimum temperature for net photosynthesis in wheat is about 77 degrees. Cool night temperatures reduce losses from dark respiration, which may be a positive for us this season as night temperatures have generally not been excessive.

Corn's growth is less affected by hot temperatures, at least within the range we have been experiencing. But even corn yields best when temperature do not exceed 90 degrees. Having full canopy closure in corn during the long days of early summer allows for greater utilization of the sunlight. Some of the better looking early-planted corn fields have already canopied, which bodes well for high yield potential – as long as they don't get constrained by lack of moisture later in the season. Drought stress during vegetative stages of corn is well tolerated. Nevertheless, the effect of drought stress tends to accumulate and depletes reserves of moisture in the soil so that yield losses will be even more pronounced if drought persists through the more sensitive stages of flowering and early grain fill.

Joel Ransom
Extension Agronomist for Cereal Crops

SOILS

Big Rains, Big N Worries

There have been big rains in large areas of North Dakota, particularly north of Rt 2. Six inch rains in a few days, followed by 6-7 inch rains in a few days, 10-15 inches total over a few weeks. Corn is sitting in either standing water or saturated soils. N loss in high clay soils averages about 1.5% nitrate N per day under saturated soil conditions. In eastern North Dakota, loam soils are also at risk to some level of denitrification, as well as leaching. Corn in many fields is yellowing on the bottom, with symptoms similar to N deficiency. Since many of these fields are V6-V8, there is still time to for the corn to recover. If the nitrate has simply moved below the present rooting depth, the roots could catch up to it later on. It is important to wait a few days for the field to dry somewhat and the water content of the soil to lower. When this happens, some of the corn will begin to green up again. Corn that does not green up may need a late side-dress application, either by streaming UAN/ATS between the rows, or applying up to 46 pounds N/acre as urea treated with an NBPT or NBPT product (Agrotain or its siblings or Limus) over the top. If S is also suspected to be a problem due to leaching, 10 pounds S per acre as ammonium sulfate can also be applied over the top. To confirm N or S deficiency, a paired plant sampling in green areas compared to the distressed area can be diagnostic.

Dave Franzen
NDSU Extension Soil Specialist

WEEDS

AMS in Holding Tanks

Question: A question about dry AMS. I have a large grower that is going back to dry AMS vs a commercial liquid product. Is there any problem if he pre-mixes his AMS in his holding tanks at the correct rates needed for the farm? There could be times when the 4000 gal tanks sit full for 5 days or more if a large rain event occurs, etc. All my other guys mix the dry as they spray by the tank load, but he needs to pre-mix it in his holding tanks if possible due to the size of his operation and to speed up the spraying process. He will be inducting the AMS thru a cone into the large holding tanks, so he should get a good mix.
Answer: Good question – realistically there is nothing different from what you are asking compared to a standard liquid AMS solution. AMS is a salt and remains in solutions. It does not hydrolyze or oxidize. The solution will not precipitate until maximum concentration is exceeded – which is approximately 3.4 lbs/gallon of water – **See page 74 in 2016 ND Weed Control Guide**.

Premixing AMS is a very good idea to save time. The only concern I have would when water temperature is cold and the salts may precipitation. Warm water can solubilize salts at a higher concentration than cold water…..duh, that was a worthless statement- everybody knows that.

Softened Water used for Herbicide Application

Question: Rich, I received this e-mail message about switching from AMS to large commercial water softeners for herbicide application. Have you had any experience with growers using this for glyphosate applications etc.? Besides the cost what other downsides are there? Thanks!
Answer: I direct you to the 2nd greatest book ever written - **page 122 of the ND Weed Control Guide**. It contains the formula that Dr. John Nalewaja, NDSU Weed Scientist developed to determine the amount of AMS needed to overcome hard water antagonism.

The amount of AMS needed to overcome antagonistic ions can be determined as follows:

Lbs AMS/100 gal = (0.002 X ppm K) + (0.005 X ppm Na) + (0.009 X ppm Ca) + (0.014 X ppm Mg) + (0.042 X ppm Fe).

Notice that the 2nd cation listed is Na and its relative strength of antagonism is 5 compared to Ca = 9, Mg = 14, and Fe = 42. Na is an antagonist. It is the basis of antagonism when Basagran is mixed with Poast where the Na from the bentazon binds with sethoxydim and antagonizes grass control.
One point that is even more important – soft water does NOT contain ammonium which is just as important as the sulfate which binds the cations. Ammonium drives the proton pump that enables weak acid herbicides to cross cell membranes and improve absorption and translocation. I wrote about this and more in **last year's crop and pest report**.

Rich Zollinger
Extension Weed Specialist