UNIVERSITY OF MISSOURI
Extension

AG CONNECTION

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Weather Stations May Help in Management of Your Farm

Weather events have a large impact on Missouri's farming operations. Given the importance of weather to the success of Missouri's farms, weather stations have been placed throughout Missouri by Extension's Commercial Agriculture Program.

Data from these stations are reported as menu items on AgEBB (Agricultural Electronic Bulletin Board). The locations are listed by county.

The weather information reported is the hourly and daily conditions at each location. The conditions observed are:

- Air temperature
- Relative humidity
- Wind direction and speed
- Soil temperature at the two inch depth
- Solar radiation

The summaries of these weather elements are presented on AgEBB as Menu Items:

- Daily Weather Report
- Hourly Weather Data
- Calculated Weather Indices
- Accumulated Weather Summaries, year to date

Information on the weather stations can be found at:
http://agebb.missouri.edu/weather/stations/index.htm

The weather information is especially useful for crop farmers, as there is information on degree days, rainfall and soil temperature. It is also useful to livestock farmers, as the records on temperature and humidity can be useful in managing the ventilation and cooling systems in confinement livestock buildings.

Horizon Point is another service that is offered by University of Missouri Extension. It is a custom weather analysis system for farmers, which includes site specific information for your location.

You can register for a user account and have the information sent to you by email each week at:
http://agebb.missouri.edu/horizonpoint/

Questions concerning weather station information presented should be directed to Pat Guinan, State Climatologist, MU (573) 882-5908.

Author: Don Day, Natural Resource Engineer

For more information, contact your local University of Missouri Extension Center:

- **Audrain County** (573) 581-3231
- **Benton County** (660) 438-5012
- **Boone County** (573) 445-9792
- **Callaway County** (573) 642-0755
- **Carroll County** (660) 542-1792
- **Chariton County** (660) 288-3239
- **Cole County** (573) 634-2824
- **Cooper County** (660) 882-5661
- **Howard County** (660) 248-2272
- **Moniteau County** (573) 378-5358
- **Morgan County** (573) 378-5358
- **Osage County** (573) 897-3648
- **Pettis County** (660) 827-0591
- **Saline County** (660) 886-6908

When Fertilizing Go Easy on the Sea Salt

There has been a recent increase in calls to MU Extension wondering about the fertilizer benefits of sea salt. Sea salt, like table salt, is primarily sodium chloride. It typically contains two percent other minerals but the content can be higher in some sources. The other minerals can include potassium, calcium, magnesium and some micro-nutrients with the exact content varying from source to source.

University of Missouri research has shown limited response to micro-nutrient fertilizer on Missouri soils and there are soils in Missouri that require additions of phosphorus and potassium. Use soil testing to document soil deficiencies of phosphorus and potassium and soil testing and plant tissue testing to evaluate micro-nutrient deficiencies in crops. For more information on micro-nutrient deficiencies see the University of Missouri IPM guide 1016, *Crop Nutrient Deficiencies and Toxicities* http://extension.missouri.edu/explorepdf/agguides/pests/ipm1016.pdf

If you document a deficiency in one of these nutrients is sea salt a good fertilizer to supply these nutrients? The short answer is no. The concentration of beneficial nutrients is so low in sea salt it would take high rates to apply an agronomically significant amount of a beneficial nutrient. Potassium is typically less than one percent sea salt, so a ton would supply less than 20 pounds, less than is removed in a ton of hay or 100 bushels of corn. Micro-nutrient concentrations are typically less than 0.01 percent so a ton of salt would provide less than a half pound of micro-nutrient.

There are potential negative effects of applying sea salt to crops. Too much salt near germinating seeds can hurt germination. Too much sodium can disperse soil structure and reduce yields in many crops. Farmers typically manage the salt content in fertilizers by avoiding direct contact of fertilizer with seeds and using higher concentration fertilizers to limit the amount of salt applied. Sea salt as a fertilizer source would require special care to avoid salt effects on crops because its low concentration of desirable nutrients would require higher rates of application to obtain agronomically relevant of fertilizer nutrients. In summary, sea salt does contain nutrients that have fertilizer value, but there are much more concentrated and desirable sources of these nutrients that have less potential for harm to growing crops.

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Pre-emergence Herbicides More Economical as Glyphosate Prices Rise

The price of glyphosate has risen dramatically since the first of the year. Brand name glyphosate now costs about twice as much as it did a year ago. News reports indicate that there is a short supply worldwide. Monsanto has even announced that they have increased production 20% in order to attempt to meet the demand. A lot of the generic glyphosate products are reportedly made in China and they are trying to meet the demands of a world market. The increase in commodity prices is also likely playing a role in the overall price increases. The bottom line is that the cheapest weed control is not as cheap as it used to be.

The increasing price of glyphosate may change the way in which you approach your soybean herbicide program. According to Kevin Bradley, state Extension weed specialist, this price increase makes most pre-emergence soybean herbicides economically feasible. In the past, the cost of two applications of glyphosate in Roundup Ready soybeans has been unbeatable from a economic standpoint. Now at a chemical cost of $11 to $12 per acre for a brand name glyphosate treatment, most preemergnce soybean herbicides like Authority First, Boundary, Canopy, Dual II Magnum, Envive, IntRRo, Prefix, Prowl H2O, Sonic, Valor and Valor XLT will cost about the same or less. Generic glyphosate products will probably remain slightly lower in cost than many of these preemergnce treatments, but there is a strong case to be made for the use of preemeergnce herbicides in soybeans. Watch the prices as the season progresses. The relationship of the cost of glyphosate versus other herbicides may change.

Another reason to consider pre-emergence herbicides is to protect maximum yield. A survey conducted in 2007 in Missouri indicated that the majority of first-pass glyphosate applications were made when weeds were 7 to 10 inches tall. At that point, some yield loss will probably have occurred in most fields. A pre-emergnce herbicide would eliminate the weed competition and allow for a timely glyphosate application later in the season to control escapes or species that emerge later in the season.

In addition, a pre-emergence herbicide can be included in a herbicide rotation to prevent or manage glyphosate-resistant weeds. Results from the previously mentioned survey also indicated that glyphosate-resistant waterhemp now occurs on at least four percent of the soybean acres in Missouri. Many of the pre-emergence herbicides will provide good control of waterhemp in soybeans.

Some may be tempted to reduce the rate of glyphosate in order to reduce expense. Bradley strongly recommends that glyphosate rates not be reduced. Reduced rates usually translate into reduced weed control and increased yield loss. Reduced rates also contribute to the increased possibility of resistant weed species developing.

Author: Wayne Crook, Agronomy Specialist

Irrigation Scheduling

Several methods of irrigation scheduling are used in agriculture. Some are more scientific than others. Kicking the dirt (soil) is one method. It gives you a good idea of what the surface conditions are and it may ease some of your frustrations. However, this method gives you little idea of what is going on beneath the surface.

Gypsum moisture blocks can be used to determine soil moisture levels beneath the surface. Normally, blocks are placed at 6", 12" and 30" levels. A meter is used to measure the electrical resistance of the blocks to a flow of electricity. This is converted to an estimate of the moisture level. Moisture meters and gypsum blocks can be purchased for a fairly reasonable cost.

Another method of irrigation scheduling was developed by Dr. Woodruff. It was in the form of a guide sheet that had a chart of moisture use. Now this guide has been converted to an electronic format and you can develop your own Woodruff chart by accessing it on the Internet.

Charts can be developed for corn, cotton and soybean. You can also choose from a wide choice of soil types. In addition, you can select your county. The Woodruff Irrigation Chart is a method of scientifically applying irrigation without the need of a computer. The method uses historic weather data and modern crop coefficients to develop a chart to determine when to irrigate. It does this by calculating an *accumulative crop water use* curve for the crop and locale in question. A second curvilinear line, representing the onslaught of drought, is drawn parallel to the crop water use curve being offset vertically by a distance equal to the water holding capacity of the soil. The X-axis represents time, while the Y-axis represents inches of water.

The user records rainfall amounts in a vertical fashion on the day they occur, using the same scale as the crop water use curve. The second and subsequent rainfall events are written on the graph on the appropriate date. These subsequent lines start at a level equal in elevation to the top of the last penciled-in rainfall event, thus a stair-step pattern is formed. Irrigation occurs before the stair-step crosses the bottom drought line. Irrigation amounts are recorded in the same manner as rainfall events. If a rainfall or irrigation amount takes the stair step across the top line, any portion above the accumulative curve is considered deep percolation and thus discounted. Then the irrigator begins the stair step, not at the top of the rainfall line, but at a level equal to where the rainfall line and the accumulative water use line crossed.

You can access the Woodruff chart at:
http://agebb.missouri.edu/irrigate/woodruff/

Author: Don Day, Natural Resource Engineer

Atrazine: History, Use and Issues

Atrazine was registered by CIBA-GEIGY about 50 years ago in 1958. Few pesticides have had this long a life. Syngenta is now the primary registrant and base but not the only producer of atrazine.

As a corn and grain sorghum herbicide, it has seen huge popularity especially during the 1960's and 1970's. It continues to be popular due to its low cost and high effectiveness against numerous weeds at different growth stages. Atrazine can be used by itself or can be found in mixes with other herbicides. It can be applied as a pre-plant, pre-emergence, or post-emergence treatment with the expectation of little to no injury to the crop.

Atrazine's most popular application timing of pre-plant or pre-emergence is in the spring when frequent heavy rains are most likely to occur. Atrazine's chemical properties allow it to leach through the soil or be lost in runoff during heavy rains. The result of not being able to meet the water quality standards for atrazine is the loss or banning of this herbicide .

EPA understands the economic considerations of limited atrazine use and would like to see a fourth option of voluntary restriction and improved land use management. Three different actions were considered. They involved: (1) banning the use of atrazine, (2) restricting applications to post-emergence treatments and (3) adjusting uses to meet a particular water quality goal. EPA understands the economic considerations of limited atrazine use and would like to see a fourth option—voluntary restriction and improved land use management. If usage is adjusted and farmer acceptable land management practices are used, the watersheds should meet water quality goals giving environmental protection at the lowest cost.

Several Missouri watersheds have had problems with too high concentrations of atrazine. One nearby was the drinking water lake at Vandalia. Work among the farmers, the city of Vandalia and others identified several approaches to reduce atrazine concentrations.

One approach was adjusting crop plantings. A survey indicated most farmers were planting corn the same year and rotating to soybeans the next year. By adjusting plantings to even the corn versus soybean acreage planted in a single season, less atrazine was used without any other management changes. Several other practices were adopted by Vandalia's farmers as well as water treatment plant changes. They were able to meet water quality standards by working together.

Now the Goodwater Creek watershed north of Centralia is being monitored since higher than allowed levels of atrazine have been found. Residents in the watershed are beginning the planning process just like those in the Vandalia lake watershed. The committee will be able to apply for grant funds to assist in adopting best management practices in the watershed.

The result of not being able to meet the water quality standards for atrazine would be the loss or banning of this herbicide.

EPA and Syngenta are working together to help watershed farmers meet water quality standards for atrazine. Some of the recommended best management practices (BMP) for reducing atrazine runoff are:

- Field borders at least 60 feet wide
- Grass filter strips built in accordance with Natural Resources Conservation Service guidelines
- Using two-pass pesticide applications like splitting application rates between pre- and post-emergence applications
- Reduce atrazine to less than 1 pound of active ingredient a season
- Establishing riparian buffers along streams and creeks where atrazine is not applied
- Strip cropping
- Timing of application based on weather conditions

Not all of these practices may need to be adopted. Combinations of practices like field borders, grass filter strips and riparian buffers may be enough to reduce atrazine and benefit farmers in other ways. The use of warm season native grass adjacent to crop fields in University of Missouri research and demonstrations has shown benefits to quail and effectively intercepts runoff.

Author: Jim Jarman, Agronomy Specialist

AG CONNECTION

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http://extension.missouri.edu/agconnection/index.htm .

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