Hello Northeast Ohio Counties!

The dry spell continues for most of NE Ohio but there is rain in the forecast starting tomorrow. Lack of rain has given local producers a good window to get crops planted, but now we could use some water.

The weather this year has been inconsistent and unpredictable. The second article discusses the current outlook through harvest. The article is by agronomy team partner, Jim Noel from the National Weather Service.

Have a great week and stay safe!

Lee Beers, Trumbull County Extension Educator
Andrew Holden, Ashtabula County Extension Educator
Angie Arnold, Portage County Extension Educator
OSU Extension Trumbull County is Hiring!

Applications are currently being accepted for an ANR/4-H Program Assistant in Trumbull County. This position is .75FTE and will provide program support for the Agriculture and Natural Resources (ANR) and 4-H Youth Development program areas in Trumbull County. To apply please visit https://osu.wd1.myworkdayjobs.com/en-US/OSUCareers/job/Satellite-Campus/Program-Assistant-ANR-4-H_R15142-1.

Job duties include: Under the direction of the ANR Extension Educator provide guidance and support to the Master Gardener Volunteers through database management, educational support, coordinating events, and overseeing activities. Assist ANR Extension Educator with questions related to homeowner horticulture, plant diagnostics, soil test reports, etc. Support 4-H Extension Educator with youth development programs including Camp Whitewood, activities related to fair, and 4-H member and volunteer enrollment management (4-H Online). In addition, assist the Educators with program communications through creating and/or editing content (ie. email, e-newsletters, press releases, etc.). This is a two year term appointment.

25% - Under the guidance and direction of the ANR Educator assist with answer questions from homeowners related to plant disease, soil test reports, and other ANR related activities (ie. scouting, e-newsletters, press releases)

50% - Assist in planning, conducting and managing the county Master Gardener Program including the online database.

25% - Under the guidance and direction of the 4-H Youth Development Extension Educator, planning, implementing, and supporting 4-H programs including resident camping programs for Camp Whitewood, STEM Day Camp, fair related activities and events, and 4-H enrollment management (via 4-H Online).

Required qualifications
Bachelor’s degree or an equivalent combination of education and experience; excellent organizational, interpersonal, and communication skills; experience with Microsoft office systems; ability to work occasional evenings and weekends to attend meetings, events, and programs as needed.

Desired qualifications
Experience with technology (ie. creating digital content, social media, website management). Experience in the areas of youth development, agriculture, horticulture, and/or natural resources. Above average communication and problem-solving skills. Can work both independently and as a member of a team.

Application Deadline 05/25/2021

Northeast Ohio Agriculture

OHIO STATE UNIVERSITY EXTENSION
Ashtabula, Portage and Trumbull Counties
**Roller Coaster Ready?**

By Jim Noel  
Source: https://agcrops.osu.edu/newsletter/corn-newsletter/15-2021/roller-coaster-ready

The climate has been on a wild roller coaster. After a cool early May, late May was really warm bringing temperatures for May to near normal. Rainfall has also been on a roller coaster.

For June we expect the roller coaster to continue with the trend being your friend. Confidence is not high in the outlooks as our models have struggled a little. The soil moisture you have in the ground is a great predictor (30-50% of the total weight) of your potential outcome for rainfall in the summer. Dry areas tend to stay drier and wet areas tend to stay wetter.

The June outlook calls for slightly warmer than normal temperatures (with some big swings still). It may start off a little cooler before turning warmer than normal again. Rainfall favors not far from normal north and wetter than normal far south. Confidence is low in the northwest area of the state where it could also end a bit drier as storms keep missing that area.

The summer outlook keeps that pattern going into August with warmer than average (but not real extreme) and rainfall favoring above especially in the far eastern areas. The northwest area is very uncertain as it could go toward the dry or wet side.

Fall harvest season continues the trend of warmer than normal but again not real extreme deviations. Rainfall will be driven by how the tropical season shapes up. If the return flow from the Gulf of Mexico and Atlantic track is over us it would be wetter this autumn but if the moisture track is to our east then it will create a downward motion with drier than normal conditions. We will update this as summer progresses.

The 16 day rainfall outlook can be found here: https://www.weather.gov/images/ohrfc/dynamic/NAEFS16.apcp.mean.total.png

Typically, we receive around 2 inches over a 16-day period currently.
**Head Scab Risk Low**
By: Pierce Paul and Aaron Wilson
Source: https://agcrops.osu.edu/newsletter/corn-newsletter/15-2021/head-scab-risk-low

According to the FHB forecasting system (http://www.wheatscab.psu.edu/), the risk for head scab is low across the state of Ohio for wheat flowering (anthesis) today, May 24, and over the next three days. Although temperatures have increased over the last few days, it has been very dry across most of the state where is crop is between full head emergence and early anthesis (flowering). Infrequent rainfall and low relative humidity between heading and early grain fill usually reduce the risk for scab, as the disease develops best under warm, wet, or humid conditions. However, do keep your eyes on the weather and the forecasting system as the crop continues to go through the anthesis growth stage over the next several days. The forecast is for cooler temperatures and average rainfall over the next week, with a few scattered and isolated showers between Wednesday and Saturday. If the weather turns wet and humid in your area over the next few weeks, the risk for scab and vomitoxin contamination of grain will increase. You may need to consider applying Prosaro, Caramba, or Miravis Ace, but remember, these fungicides are most effective against head scab when they are applied at or a few days after anthesis. Click on the links below for more details on fungicide efficacy and application for head scab control:
https://agcrops.osu.edu/newsletter/corn-newsletter/2020-13/managing-head-scab-fungicides-qa
**Is your pasture telling you it has a fertility problem?**

By: Dean Kreager

Source: [https://u.osu.edu/beef/2021/05/19/is-your-pasture-telling-you-it-has-a-fertility-problem/#more-10852](https://u.osu.edu/beef/2021/05/19/is-your-pasture-telling-you-it-has-a-fertility-problem/#more-10852)

If plants could talk, we could learn a lot and our jobs as stewards of the land would be much easier. When we go to the doctor because we are sick, we do not sit quietly and expect the doctor to know how we feel and then tell us how to get better. We need to provide information that will help with the diagnosis. But since plants cannot talk, our job is difficult when we try to locate the source of a problem such as low productivity or an infestation of weeds.

Recently one of my colleagues, Ed Brown, suggested a method of taking stock of what is growing in your pasture. Knowing what plants are growing in your pastures is an important first step in listening to what the pasture is telling you. Varieties of plants or changes in these populations from year to year can provide important clues. Indicator plants are plants that can provide suggestions of issues in the soil based on the presence of particular plants. Often, perennial weeds can be our best indicator plants. These plants are living in a condition that has allowed them to survive for multiple years. Annual plants only need conditions that allow them to make it through one growing season but their ability to come back for multiple years can also suggest problems. Identifying and inventorying these plants can be an additional tool to use when managing your pasture.

While I would not suggest that these plants take the place of soil testing, they could hint that a soil test is needed to interpret what the indicator plants are telling us. When used together with soil testing and continual monitoring of the stock of plants present, we can document actual improvements over time.

Much of the information on indicator plants dates back many years but there continue to be studies from universities that support many of the old findings. Here are some examples of indicator plants but there are many more.
- Broadleaf plantain may indicate compacted soil with low fertility.
- Broom sedge is often an indicator of low phosphorous which may be due to low pH.
- Burdock can indicate low calcium and high potassium.
- Curly dock often indicates wet or compacted soils, as well as low calcium and extremely high magnesium, phosphorous, and potassium soils.
- Knapweed does well with low calcium and very low phosphorous.
- Oxeye daisy likes low phosphorus, high potassium, and high magnesium.
- Common mullein often indicates low pH rocky soils.
- Redroot pigweed can indicate too much iron or to little manganese, it may also indicate high potassium and manganese and low phosphorous and calcium and is often an indicator of fertile soil.

Usually, our goal is to find a way to remove weeds from our pastures. They typically reduce productivity and compete against the desired forages. Research has shown that simply removing those weeds without addressing the issue of why they grew there in the first place will only provide a short-term solution as the weeds will likely return. Taking stock of weeds and listening to what they are telling us about soil conditions can be an additional tool in our toolbox.

We do our best to provide a good representative soil sample to learn about the fertility status on our pastures. These samples are great for providing averages. However, maybe we did not pull a sample from a particular area and realize that area is covered with broom sedge. Going back and taking a soil sample in that area could be valuable in both getting rid of the weed problem and improving fertility.

Pick up a good weed identification guide and do not be afraid to contact your local Extension Educator for assistance with identification. There are also several university-based guides for assistance with what these weeds may be telling you.

Listening to those indicator plants is one more tool for managing your pastures.
Ohio Supreme Court Rejects Challenge to CAUV Table

By: Peggy Kirk Hall
Source: https://farmoffice.osu.edu/blog/thu-05202021-900am/ohio-supreme-court-rejects-challenge-cauv-table

We learn early in law school that it’s an uphill battle when challenging agency actions in court, as the law typically grants agencies discretion to apply expertise and professional judgment when making decisions. A landowner in Clark County just learned this lesson. The landowner appealed the Ohio tax commissioner’s adoption of the 2016 Current Agricultural Use Valuation (CAUV) table, but the Ohio Supreme Court found no showing of an abuse of discretion by the agency.

The case arose from the CAUV valuation update in 2016 of William Johnson’s land in Clark County. In setting the CAUV values, the county auditor consulted the unit-value table adopted by the tax commissioner. The unit-value table lists soil types and ratings of each soil type along with per-acre values for each soil type. The tax commissioner annually adopts the table using a potential-income approach, as required by Ohio law, which determines typical net income from agricultural products for each type of soil, assuming typical management, yields, and cropping and land use patterns. A county auditor refers to the unit-value table when determining CAUV farmland values, applying the per-acre values from the table to the soil types on a parcel.

Johnson claimed that his CAUV value was too high because the 2016 unit-value table adopted by the tax commissioner did not list separate values for drained and undrained soils on his land. The table does list differing values for Adrian, Carlisle and Linwood soils—one value for drained soils and one value for undrained soils. However, the table lists just one value for all Crosby, Kokomo, and Patton soil types, the soils contained on the Johnson’s parcel. Johnson argued that the tax commissioner erred by adopting the unit-value table without establishing separate values for drained and undrained Crosby, Kokomo, and Patton soil types.
The Supreme Court explained that Johnson’s challenge required showing that the tax commissioner committed an “abuse of discretion” in adopting the unit-value table. Two important principles apply to the “abuse of discretion” standard, the first being that the court will not substitute its judgment for the agency’s judgment unless the agency acted with an unreasonable, arbitrary, or unconscionable attitude. The court also presumes that an agency’s decision is carried out in good faith and with sound judgment, unless there is proof to the contrary.

According to Johnson, the tax commissioner abused his discretion in several ways: by departing from the USDA’s taxonomy of soils, excluding data for land lacking artificial drainage, and not listing all soils with drained and undrained variations. The court found no abuse of discretion, however, and no evidence to support the Johnson’s claims. The court pointed out that the commissioner, as required by law, consulted with the “agricultural advisory committee” in preparing the table and referred to both Ohio State University’s Bulletin 685 and updates to the USDA taxonomy for guidance on soil types. Explaining that the CAUV potential-income approach required the commissioner to determine “typical” management practices, the court stated that the commissioner was justified in not establishing a separate value for the Johnson’s “atypical practice” of not installing artificial drainage for the specific soils on his property. Considering investments required for artificial drainage for some soil types but not for others doesn’t prove an abuse of discretion, the court stated.

The court’s conclusion reiterates the lesson on the difficulty of challenging an agency decision:

“To repeat: the differential treatment of soil types reflects the exercise of judgment by the commissioner, which we presume to be sound. . . The record does not disclose the rationale for every consideration underlying the unit-value table, but it was not the commissioner’s burden to demonstrate the reasonableness of the CAUV journal entry—it was Johnson’s burden to show an arbitrary or unconscionable attitude on the part of the commissioner. He has not done so.”

Read the Ohio Supreme Court’s decision in Johnson v. McClain here.
Study: Fluorescent Light Clarifies Relationship between Heat Stress and Crop Yield.
By: Lois Yoksoulian
Source: https://news.illinois.edu/view/6367/147165440

CHAMPAIGN, Ill. — Scientists report that it is possible to detect and predict heat damage in crops by measuring the fluorescent light signature of plant leaves experiencing heat stress. If collected via satellite, this fluorescent signal could support widespread monitoring of growth and crop yield under the heat stress of climate change, the researchers say.

Their study measures sun-induced chlorophyll fluorescence – or SIF – to monitor a plant’s photosynthetic health and establish a connection between heat stress and crop yield. The findings are published in the journal Global Change Biology.

Sun-induced chlorophyll fluorescence occurs when a portion of photosynthetic energy, in the form of near-infrared light, is emitted from plant leaves, the researchers said.

“There is a link between sun-induced chlorophyll fluorescence and photosynthetic rate in plants; however, it was unclear if SIF detection could measure physiological responses in heat-stressed plants,” said lead author Hyungsuk Kimm, a natural and resources and environmental sciences graduate student at the University of Illinois Urbana-Champaign. “When soybeans are exposed to high-temperature stress, for example, they do not show any distinctive changes in canopy structure, and conventional remote sensing signals do not provide clear consequential spectral signatures.”

To clarify the link between SIF and crop yield, researchers used a hyperspectral sensing system to measured SIF above soybean crops in the U. of I.’s Temperature Free-Air-Controlled Enhancement experimental plots in central Illinois. The setup monitored changes in chlorophyll fluorescence of soybean leaf canopies in a controlled environment using infrared lamps to raise temperatures 1.5, 3.0, 4.5, and 6.0 degrees Celsius above the ambient crop canopy temperature, the study reports.
“This experimental setup – and it’s a large temperature gradient – is the first of its kind,” said co-author Carl Bernacchi, a professor of plant biology and of crop sciences and a research scientist with the U.S. Department of Agriculture’s Agricultural Research Service at the U. of I.

“We found that sun-induced fluorescence responds to temperature increases and corresponds with fewer and lower quality soybean leaves,” said natural and resources and environmental sciences professor Kaiyu Guan, who directed the study. “We also found that heat stress has a great impact on soybeans during their reproductive stages when the plants are producing grain, which ultimately affects the size and quantity of the resulting soybeans.”

This study establishes a correlation between heat stress, SIF and grain quality and clarifies how heat stress affects photosynthetic performance and crop yield.
“The technique may provide a tool for breeders to identify more heat-resistant crops and help farmers select the best crops to grow in the U.S. Corn Belt as temperatures rise, as predicted by many climate models,” said co-author Lisa Ainsworth, a plant biology professor and U.S. Department of Agriculture scientist at Illinois.

Illinois researchers Charles Burroughs, Bin Peng, Caitlin Moore and Genghung Wu also participated in this research. The U.S. Department of Agriculture, NASA and the National Science Foundation supported this study.

Guan also is affiliated with the National Center for Supercomputing Applications and the Institute for Sustainability, Energy and Environment. Bernacchi and Ainsworth also are affiliated with the Carl R. Woese Institute for Genomic Biology. Guan, Ainsworth and Bernacchi are founding faculty members of the Agroecosystem Sustainability Center at Illinois.

**Weed control and delayed planting**

By Mark Loux, Ohio State University Extension

Source: [https://ocj.com/2021/05/weed-control-and-delayed-planting/](https://ocj.com/2021/05/weed-control-and-delayed-planting/)

It’s déjà vu all over again. We have run this article every few years, and it seems like maybe the frequency is increasing as we deal with wet and cold weather that delays planting. The questions about this have not changed much, and neither have the suggestions we provide here. One of the most common questions, predictably, is how to kill glyphosate-resistant marestail and giant ragweed and generally big weeds in soybeans when it’s not possible to delay planting long enough to use 2,4-D ester (Enlist soybeans excluded since there is no wait to plant). Overwintered marestail plants become tougher to kill in May, so this is an issue primarily in fields not treated last fall. The good news is that we have more effective herbicide/trait options for help with burndown compared with a few years ago. The bad news is that nothing we suggest here is going to be infallible on large marestail.

A burndown of glyphosate and 2,4-D struggles to control marestail in the spring anyway, especially in the absence of fall herbicide treatments. Our standard recommendation, regardless of when spring treatments are applied, is to either replace the 2,4-D with something more effective, or to add another herbicide to supplement the 2,4-
D. Sharpen has been the frequent replacement/supplement, and we now have the option to use dicamba in the Xtend soybean system instead of 2,4-D. While it’s possible to use higher 2,4-D rates in the Enlist soybean without waiting to plant, higher rates do not necessarily solve this issue based on our research, although a follow up POST treatment that includes glufosinate or 2,4-D usually finishes off plants that survive burndown. There’s a list of suitable soybean burndown treatments in our marestail fact sheet, and also below – these are for fields not treated the prior fall.

- Glyphosate + saflufenacil + 2,4-D (+ metribuzin if possible)
- Gramoxone (3-4 pt) + 2,4-D + metribuzin
- Glyphosate + dicamba (Xtend soybeans)
- Glyphosate + dicamba + saflufenacil (Xtend soybeans)
- Glufosinate + Sharpen (+ metribuzin if possible)

Saflufenacil herbicides include Sharpen, Zidua PRO, and Verdict. It is possible to use a mix of glyphosate, saflufenacil, and metribuzin, omitting the 2,4-D, but control can be more variable. We have observed some weakness also with the glyphosate/saflufenacil combination on dandelion, purple deadnettle, and larger giant ragweed. There is usually going to be a benefit to keeping 2,4-D in the burndown where possible, as part of a more comprehensive mixture. We advise against using Gramoxone unless it can be mixed with both 2,4-D and a metribuzin-containing herbicide. One strategy would be to plant corn first as soon fields are fit, and delay soybean planting so that 2,4-D could still be used. And a reminder – deciding to include saflufenacil at the last minute can result in a need to alter the residual herbicide program. Labels allow mixtures of Sharpen/Verdict with herbicides that contain flumioxazin (Valor), sulfentrazone (Authority), or fomesafen (Reflex) only if applied 2 or more weeks before planting.

Some other things to consider in a delayed burndown situation:

1. Aside from glyphosate-resistant weeds, increasing glyphosate rates may be one of the most effective ways to maintain effective control. We suggest a rate of at least 1.5 lb ae/A, and higher rates could be warranted. This will not improve marestail control, but should help with most other weeds, especially under (presumably) warmer May conditions.

2. To improve control with glyphosate/2,4-D, add Sharpen or another saflufenacil herbicide, as long as the residual herbicides in the mix do not include flumioxazin, sulfentrazone, or fomesafen if it’s within 14 days of soybean planting. It’s also possible to substitute Sharpen for 2,4-D when it’s not possible to wait 7 days to plant, but this may result in reduced control of dandelion, deadnettle and giant ragweed. Where the residual herbicide in the mix does contain flumioxazin, sulfentrazone, or fomesafen, and it’s not possible to change the residual or add Sharpen, adding metribuzin or Canopy Blend/Cloak DF to glyphosate/2,4-D can improve burndown effectiveness somewhat.
3. Consider substituting Gramoxone or glufosinate for glyphosate? Gramoxone is less effective than glufosinate on marestail, but glufosinate can struggle some in a dense, large no-till burndown situation. Either one should be applied with metribuzin and 2,4-D ideally. Use the higher labeled rates and a spray volume of 15 to 20 gpa for best results. A consideration here is that in large no-till weed situations, high rates of glyphosate typically have more value than high rates of Gramoxone or glufosinate, with the exception of glyphosate-resistant weeds. We know of some growers who have used a mixture of glyphosate and glufosinate for burndown, with the glufosinate in the mix to control marestail primarily. We do not have enough experience with this mix to make a recommendation in a burndown situation. The hail mary treatment here is a mix of glufosinate and Sharpen (plus metribuzin ideally), which can be expensive but somewhat of a scorched earth approach on broadleaf weeds at least.

4. In the Enlist and Extend systems where it’s possible to use 2,4-D or dicamba without waiting to plant, there can be an advantage to increasing herbicide rates as we move later and weeds become larger. Another advantage of these systems is the option to use 2,4-D or dicamba again in POST treatments to finish off weeds that survive burndown. We do have to assume that this strategy would likely select for resistance more rapidly, compared with use just PRE or POST. Including glufosinate in POST treatments of 2,4-D to Enlist soybeans should mitigate the resistance rate somewhat, although it does not substitute for late season scouting and removal of weeds to prevent seed. Reminder to consult the appropriate websites to determine the legal options to mix with 2,4-D and dicamba for use in Enlist or Xtend soybeans, especially when developing a more comprehensive mix to deal with tough burndown situations.

5. Among all of the residual herbicides, chlorimuron contributes the most activity on emerged annual weeds and dandelion. This is probably most evident when the chlorimuron is applied as a premix that contains metribuzin (Canopy Blend/Cloak DF, etc). The chloirmuron may not be much of a help for marestail or ragweed control, since many populations are ALS-resistant. Cloransulam (FirstRate) has activity primarily on emerged ragweeds and marestail, as long as they are not ALS-resistant. We have on occasion observed a reduction in systemic herbicide activity when mixed with residual herbicides that contain sulfentrazone or flumioxazin.

6. It is possible to substitute tillage for burndown herbicides. Make sure that the tillage is deep and thorough enough to completely uproot weeds. Weeds that regrow after being “beat up” by tillage are often impossible to control for the rest of the season. Tillage tools that do not uniformly till the upper few inches (e.g. TurboTill) should not be used for this purpose. One strategy to ensure complete control even in tilled situations is to apply glyphosate several days prior to tillage.
7. Late burndown in corn is typically a less dire situation compared with soybeans. Reasons for this include: 1) the activity of some residual corn herbicides (e.g. atrazine, mesotrins) on emerged weeds; 2) the ability to use dicamba around the time of planting; 3) the tolerance of emerged corn to 2,4-D (Enlist corn) and dicamba, and 4) the overall effectiveness of available POST corn herbicides. Overall, while not adequately controlling emerged weeds prior to soybean planting can make for a tough season, there is just more application flexibility and herbicide choice for corn. Having said this, be sure to make adjustments as necessary in rate or herbicide selection in no-till corn fields.

One of the OSU PrecisionU sessions that past winter dealt with planning for problems caused by wet weather in late spring. The related video on weed management can be found here.

**Hay Barn Fires are a Real Hazard**
By: Jason Hartschuh, CCA
Source: [https://agcrops.osu.edu/newsletter/corn-newsletter/15-2021/hay-barn-fires-are-real-hazard](https://agcrops.osu.edu/newsletter/corn-newsletter/15-2021/hay-barn-fires-are-real-hazard)

Hay fires are caused when bacteria in wet hay create so much heat that the hay spontaneously combusts in the presence of oxygen. At over 20% moisture mesophilic bacteria release heat-causing temperature to rise between 130°F to 140°F with temperature staying high for up to 40 days. As temperatures rise, thermophilic bacteria can take off in your hay and raise temperature into the fire danger zone of over 175°F.

**Assessing Your Risk**
If hay was baled between 15-20% moisture and acid preservatives were used, there is still potential for a hay fire but not as great as on non-treated hay. A moisture tester on your baler can help you know how moisture varies across your field and when to use hay preservative. Without a moisture tester, if you occasionally find darker green damp spots or humidity is high, be sure to monitor for heating. Most propionic acid-based products are effective at inhibiting bacteria growth in hay up to 25% moisture, with variable effectiveness at 25-30% moisture, if applied at the correct rates.
Temperature Assessment

<table>
<thead>
<tr>
<th>Temperature (°F/ °C)</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>125°/51.6°</td>
<td>No Action needed</td>
</tr>
<tr>
<td>150°/65.6°</td>
<td>Hay is entering the danger zone, check temperatures twice per day. Disassemble haystacks moving bales outside to allow air circulation to cool the hay.</td>
</tr>
<tr>
<td>160°/71.1°</td>
<td>Hay has reached the danger zone. Carefully check hay temperature every few hours. Disassemble stacked hay to promote air circulation to cool hay be very careful of even hotter spots. Have a tank of water present while unstacking.</td>
</tr>
<tr>
<td>175-190°/79.4-87.8°</td>
<td>Hot spots or fire pockets are likely. Alert fire service to the possible hay fire incident. Close barns to minimize air movement around the hay. With the assistance of fire service, remove hot hay. Be aware that bales may burst into flames, keep tractors wet so the tractor does not catch fire.</td>
</tr>
<tr>
<td>200°+/93.3°+</td>
<td>Fire is present with in the haystack near the temperature probe. With the assistance of fire service, remove hot hay. If possible, inject water into the hot spot to cool hay before moving. Most likely a fire will occur, keep tractors wet and fire hose lines charged in the barn and along the route of where bales will be stacked.</td>
</tr>
</tbody>
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Monitoring the Haystack

There are a couple options available to monitor hay temperature. One of these is high technology, like the cables that can be used to monitor temperature in stored grain. There are a couple companies that produce cables that would be placed between bales in a stack or monitoring probes that are placed in bales and use radio frequency to transmit signal.

If you believe that you maybe at risk for hay heating, monitoring temperature is critical. It should be done daily until temperatures stabilize in the safe zone or reach 150°F when monitoring needs increased too twice daily. This can be done with technology or manual temperature probes. When monitoring hay temperature, be very cautious, hot hay can burn within the stack and cause cavities underneath that you can fall into. Use planks to spread out your weight while walking on the stack and have a harness system attached to the ceiling in case you fall into a burned-out cavity. Also work in pairs with someone on the ground within voice range to assist you if you find...
yourself in a bad situation. Temperature monitoring should continue for possibly six weeks until values stabilize in the safe zone.

Temperature monitoring depends on the stack size but should be taken close to the center of the stack. In larger stacks ideally this is 8 feet down in the stack. This can be done by purchasing a long probe thermometer or building your own. Building your own can be done with a 3/8-3/4 piece of pipe or electrical conduit cut into a closed point. The pipe size will depend on the thermometer probe size you will put in the pipe. A larger pipe can be used and a thermometer on a string lowered into the pipe. Drill 3/16-inch holes in the bottom four feet of the pipe. Leave the thermometer in the stack for about 10 minutes to get an accurate reading. A less accurate method is to leave a pipe in the stack all day, and if a section is too hot to hold in your hand when removed you are at risk for fire. Or even better use an infrared thermometer to measure the temperature of the pipe. Any time temperatures are above 175ºF hay should not be removed from the barn until the local fire department is present, you are at risk for fire. Once the fire department is present hay should be carefully removed from the barn with charged fire hoses ready if spontaneous combustion occurs. Have a safe and well drying hay season this year!