Hello, Ashtabula and Trumbull Counties!

The cows pictured here are grazing in the backdrop of the Perry Nuclear Power Plant in Lake County. Today, our local Emergency Management Agencies (Ashtabula, Lake, & Geauga) are being graded by the Federal Emergency Management Agency (FEMA) for our ability to respond to a nuclear disaster event. We at OSU Extension are part of the response team as we assist farms in managing their crops and livestock during an emergency. These trainings are valuable as they help prepare use for any type of situation which might arise here in Northeast Ohio (blizzard, prolonged electrical outage, tornado, flooding, and train derailment). As the old saying goes…it is better to be prepared than sorry!

David Marrison  
Extension Educator  
Ag & Natural Resources  
Ashtabula County

Lee Beers  
Extension Educator  
Ag & Natural Resources  
Trumbull County
Greetings from Trumbull County’s New 4H Educator
By Ashlee Dietz

Greetings 4-H enthusiasts! I am extremely excited to be involved with Ohio State Extension and serve as your new 4-H Youth Development Educator. I cannot wait to see the exciting things in store for the rest of 2016! For those of you who do not know me, I am a native of Trumbull County. I grew up on a small dairy farm in Southington and was heavily involved in dairy and equine 4-H during my eleven year 4-H career. I still continue to be involved on my family’s farm and exhibit Guernseys at local, state and national shows. Academically, I graduated from The Ohio State University in 2013 with my B.S. in Agriculture, with a focus in Animal Science. Continuing my education at OSU, I received my M.S. in Dairy Science in 2015. I am a true buckeye at heart! Go Bucks!

4-H was a very big part of my childhood and helped me develop core values that still hold true in my life today. I’ve always had a passion for agriculture, animal health, and working with youth so I am thrilled that this position will allow me to be an influence in all three areas. I look forward to meeting and working with all of you to truly make the best better for years to come in Trumbull County. I am blessed to be a part of the Trumbull County team.

Some Tips for Evaluating Corn Hybrid Demonstration Plots
By Peter Thomison, OSU Extension Specialist
Source: http://agcrops.osu.edu/newsletter/corn-newsletter/some-tips-evaluating-corn-hybrid-demonstration-plots

This is the time of year when many farmers visit and evaluate hybrid demonstration plots planted by seed companies and county Extension personnel, among others. When we experience a year like 2016 in which drought and heat impacted corn performance in many fields, it’s likely we will see some striking differences among hybrids in demonstration plots. When evaluating these plots, it’s important to keep in mind their relative value and limitations. Demonstration plots can be useful in providing information on certain hybrid traits that are usually not reported in state corn performance summaries. The following are some traits to consider when examining hybrid demonstration plots.

PLANT/EAR HEIGHT. Corn reaches it maximum plant height soon after tasseling occurs. Remember that although a taller hybrid may have a lot of "eye appeal," it may also be more prone to stalk lodging in the fall. Unless your interest is primarily silage production, increasing plant height should not be a major concern. Generally later maturity hybrids are taller than earlier maturity hybrids. Big ears placed head high on a plant translate to a high center of gravity, predisposing a plant to potential lodging. The negative effects of stalk rot on stalk lodging in the fall may be greater with high ear placement. Plots that have been subjected to early season (V7 or earlier) defoliation caused by hail or frost often have lower than normal ear height.

STALK SIZE. Generally speaking, a thicker stalk is preferable to a thinner one in terms of overall stalk strength and resistance to stalk lodging. As you inspect a test plot, you will see distinct differences among hybrids for stalk diameter. However, also check that the hybrids are planted at similar populations. As population increases, stalk diameter generally decreases. Also keep in mind that uneven emergence and development may make such comparisons difficult because late emerging plants are “spindlier”.
The following are some additional points to consider during your plot evaluations:

**STALK ROTS.** Hybrids will likely differ widely when faced with strong stalk rot pressure. Begin checking plants about 6 weeks after pollination (at about black layer) by pinching lower stalk internodes with your thumb and forefinger. Stalks that collapse easily are a sure indicator of stalk rot. Remember that hybrids with thicker stalks may be in plots having thin stands.

**LODGING.** Perhaps as important as stalk rot resistance is the stalk strength characteristics of a hybrid. Sometimes, the best time to make this assessment is shortly before plot harvest. Most agronomists characterize plants with stalks broken below the ear as ‘stalk lodged’ plants. In contrast, corn stalks leaning 30 degrees or more from the center are generally described as ‘root lodged’ plants; broken stalks are usually not involved. Root lodging can occur as early as the mid-to-late vegetative stages and as late as harvest maturity. Both stalk and root lodging can be affected by hybrid susceptibility, environmental stress (drought), and insect and disease injury. Root lodging may be associated with western corn rootworm injury. However, much root lodging in Ohio occurs as the result of other factors, i.e. when a hybrid susceptible to root lodging is hit by a severe windstorm. A hybrid may be particularly sensitive to root lodging yet very resistant to stalk lodging. A corn field may exhibit extensive root lodging in July but show little or no evidence of root lodging at harvest maturity in September (except for a slight “goose necking” at the base of the plant). In recent OSU tests evaluating hybrid by plant population interactions, we observed less recovery in certain hybrids when plant populations exceeded 34-35,000 plants/A.

**GREEN SNAP** (aka "brittle snap") is pre-tassel stalk breakage caused by wind. The problem has become more common in Ohio in recent years because of the greater frequency of severe wind storms in late June and mid-July. Vulnerability to green snap damage varies among hybrids. Breaks in the stalk usually occur at nodes (along nodal plates) below the ear.

**TRANSGENIC TRAITS:** Because damage from European corn borer (ECB), western corn rootworm (RW), and western bean cutworm can be very localized, strip plot demonstrations may be one of the best ways to assess the advantages of ECB Bt, RW Bt and WBC Bt corns. The potential benefit of the ECB Bt trait is likely to be most evident in plots planted very early or very late; the potential benefit of the RW Bt trait is likely to be most evident in plots planted following corn or in a field where the western corn rootworm variant is present.

**HUSK COVERAGE/EAR ANGLE.** Hybrids will vary for completeness of husk coverage on the ear as well as tightness of the husk leaves around the ear. Ears protruding from the husk leaves are susceptible to insect and bird feeding. This year there have been reports of hybrids exhibiting short husks in states to the west of Ohio [http://cropwatch.unl.edu/2016/corn-ear-formation-issues-likely-correlated-loss-primary-ear-node](http://cropwatch.unl.edu/2016/corn-ear-formation-issues-likely-correlated-loss-primary-ear-node). Husks that remain tight around the ear delay field drydown of the grain. Hybrids with upright ears are often associated with short shanks that may be more prone to ear and kernel rots than those ears that point down after maturity. This relationship received considerable attention in 2009 when Gibberella ear rot problems were widespread across the Eastern Corn Belt. However, we’ve observed that differences in ear “orientation” among hybrids can be strongly influenced by growing season and plant density. Also, under certain environmental conditions, some hybrids are more prone to drop ears, a major problem if harvesting is delayed.

The following are some additional points to consider during your plot evaluations:
1. Field variability alone can easily account for differences of 10 to 50 bushels per acre. Be extremely wary of strip plots that are not replicated, or only have “check” or “tester” hybrids inserted between every 5 to 10 hybrids. The best test plots are replicated (with all hybrids replicated at least three times).

2. Don't put much stock in yield results from ONE LOCATION AND ONE YEAR, even if the trial is well run and reliable. Don't overemphasize results from ONE TYPE OF TRIAL. Use data and observations from multiple university trials, local demonstration plots, and then your own on-farm trials to look for consistent trends.

3. Initial appearances can be deceiving, especially visual assessments! Use field days to make careful observations and ask questions, but reserve decisions concerning hybrid selection until you've seen performance results.

4. Walk into plots and check plant populations. Hybrids with large ears or two ears/plant may have thin stands.

5. Break ears in two to check relative kernel development of different hybrids. Use kernel milk line development to compare relative maturity of hybrids if hybrids have not yet reached black layer. Hybrids that look most healthy and green may be more immature than others. Don't confuse good late season plant health (“stay green”) with late maturity.

6. Differences in standability will not show up until later in the season and/or until after a windstorm. Pinch or split the lower stalk to see whether the stalk pith is beginning to rot.

7. Visual observations of kernel set, ear-tip fill, ear length, number of kernel rows and kernel depth, etc. may provide some approximate basis for comparisons among hybrids but may not indicate much about actual yield potential. This year we’ve seen differences in tip kernel abortion (“tip dieback” or “tip-back”) among hybrids and heard reports of “zipper ears” (missing kernel rows). Even if corn ear tips are not filled completely, due to poor pollination or kernel abortion, yield potential may not be affected significantly, if at all, because the numbers of kernels per row may still be above normal.

8. Find out if the seed treatments (seed applied fungicides and insecticides) applied varied among hybrids planted, e.g. were the hybrids treated with the same seed applied insecticide at the same rate? Differences in treatments may affect final stand and injury caused by insects and diseases.

**Western Bean Cutworm Infestation and Disease Issues**

By Andy Michel and Pierce Paul, OSU Extension Specialists


Reports of ear feeding by western bean cutworm (WBC) have come in at a steady pace over the last few weeks. This is the 3rd consecutive year that we have seen a fair amount of feeding, some of it likely has led to an economic loss. The heaviest feeding has occurred in the Northwest and Northeast corners of Ohio. While it is too late to spray or control at this point (since most larvae are protected in the ear and are getting ready to pupate anyway), growers may need to watch for the development of ear rots. WBC can leave entry or exit holes in the corn husk, which can then provide a nice wound for pathogens like Fusarium and Gibberella. Some of these organisms can then be a further source for mycotoxins, including Fumonisins and deoxynivalenol, AKA vomitoxin.

In some cases, damaged kernels will likely be colonized by opportunistic molds, meaning that the mold-causing fungi are just there because they gain easy access to the grain. However, in other cases, damaged ears may be colonized by fungi such as Fusarium, Gibberella and Aspergillus that produce harmful mycotoxins. Some molds that are associated with mycotoxins are easy to detect based on the color of the damaged areas. For instance reddish or pinkish molds are often cause by Gibberella zeae, a fungus know to be associated with several toxins, including vomitoxin. On the other hand, greenish molds may
be caused by Aspergillus, which is known to be associated with aflatoxins, but not all green molds are caused by Aspergillus. The same can be said for whitish mold growth, some, but not all are caused by mycotoxin-producing fungi.

So, since it is not always easy to tell which mold is associated with which fungus or which fungus produces mycotoxins, the safe thing to do is to avoid feeding moldy grain to livestock. Mycotoxins are harmful to animals – some animals are more sensitive to vomitoxin while others are more sensitive to Fumonisins, but it is quite possible for multiple toxins to be present in those damaged ears. If you have damaged ears and moldy grain, get it tested for mycotoxins before feeding to livestock, and if you absolutely have to use moldy grain, make sure it does not make up more than the recommended limit for the toxin detected and the animal being fed. This link provides more information on ear molds and mycotoxin contamination:

http://www.oardc.ohio-state.edu/ohiofieldcropdisease/t01_pageview2/Mycotoxin_Sampling_Laboratories_.htm

Using Cover Crops with Fall Manure Applications
By: Glen Arnold, OSU Extension Manure Management Field Specialist (This article first appeared in the September 2, 2016 on-line issue of Ohio's Country Journal)

Livestock producers will soon be applying manure following corn silage harvest. Both soybean and corn harvest will be about normal this year. To best capture the nutrients in manure, livestock producers should incorporate fall applied manure and also consider using cover crops.

Fall cover crops have been planted in Ohio for many years. While primarily used to help control soil erosion, cover crops can also recapture nutrients in livestock manure and keep these nutrients from escaping into lakes, streams and rivers.

The most common cover crops used with livestock manure are cereal ryegrass, oats and radishes. However, farmers have also used wheat, clover, annual ryegrass, or almost anything they are comfortable growing.

- Cereal ryegrass is the best cool-season grass for capturing excess nitrogen. Because rye over-winters, research has shown it can capture and hold 25 to 50 pounds of nitrogen (organic form). It germinates at lower temperatures than oats so may be planted later, but less nitrogen will be recycled the later the rye is seeded. It will grow later in the fall and begin growth earlier in the spring than wheat.
- Oats are sometimes used as a cover crop in the fall and need to be planted soon after silage harvest. Drilling oats improves germination and growth before frost. Some farmers in northwest Ohio have had great success surface seeding oats and incorporating with shallow tillage. Oats winter-kill and are not a problem in the spring for no till or minimum tillage systems.
- Another cover crop that is excellent at recycling nitrogen is oilseed radish. Oilseed radish is a fast growing, non-legume broadleaf that needs nitrogen to grow rapidly so it is often used with livestock manure. Needing time to grow, radishes are usually not the best option following soybeans or corn in October. Radishes typically winter-kill when temperatures reach 20 degrees F but farmers in Ohio occasionally report radishes surviving winters thanks to snow cover when temperatures are their coldest. Surviving radishes were easily controlled with a burndown herbicide.

Cover crops can help livestock farmers recapture manure nutrients and conserve soil by reducing erosion. Cover crop seedings do not have to be perfect. The goal is to combine nutrient recovery and to protect the environment.

What Could Have Been for MPP-Dairy
by Scott Brown, University of Missouri
There is growing discussion around needed changes to the Margin Protection Program for Dairy (MPP-Dairy) as the next farm bill debate nears. Current agricultural policies must always be evaluated as the dynamics of agricultural markets change over time and MPP-Dairy is no different.

It remains important to understand how the current program works before better alternatives can be found. Changes to MPP-Dairy can make the program better but will likely raise government outlays. A simple example can shed light on how MPP-Dairy would have operated had it been in existence since 2000. If a dairy producer with a production history of 4 million pounds had chosen $6.50 MPP-Dairy coverage every year beginning in 2000 they would have seen a net gain from the program of about 18 cents per hundredweight of covered production. This shows that MPP-Dairy payments made more than offset the premiums paid into the program had it been in operation from 2000 through 2016.

MPP-Dairy is a margin insurance program, and it tends to operate like other insurance products. MPP-Dairy would not have paid often over the 2000 to 2016 period, but when it would have, it would have resulted in large payments for short periods of time like traditional insurance products. The periods of 2002 to 2003, 2009, and 2012 to 2013 stand out over the 2000 to 2016 period where the largest MPP-Dairy payments would have occurred.

Dairy producers have shown that they will adjust their annual coverage level depending on their expectation of future margin levels for the next year. However, they must evaluate these changes in coverage levels carefully as the example here shows that just eliminating the payments received in 2009 would have reduced the expected benefit of MPP-Dairy by more than 66 percent.

The 18-cent benefit over the 2000 to 2016 period may seem small, but the level is in alignment with the expected budget scoring of the MPP-Dairy program provided by the Congressional Budget Office during the 2014 farm bill debate. In this example, the 2016 payments for a 4 million pound production history operation that chose the $6.50 coverage level will add nearly $1,000 to the bottom line despite making a payment in only one bi-monthly period.

**Take the OSU Lake Debris Survey Today!**
The Ohio State University, City of Cleveland Mayor's Office of Sustainability, and Thunder::Tech Inc., are working together to conduct a research project on the health of Lake Erie - and we need your help.

The goal is to better understand how and why certain trash items end up in Lake Erie, specifically plastic bottles, shopping bags, and cigar tips. This project will look into why people use disposable items like water bottles and plastic bags, and why more people don’t use reusable drinking bottles or shopping bags.

Your answers to the attached survey will help inform efforts that encourage people to switch from single-use plastics to reusable containers, and properly dispose of plastic debris instead of littering. The survey should not take more than 20 minutes to complete. We further hope the results will help other cities and states in the Great Lakes region clean up their lakes, too.

Survey Link: [https://osu.az1.qualtrics.com/jfe/form/SV_56VmwPlyyU0NclD](https://osu.az1.qualtrics.com/jfe/form/SV_56VmwPlyyU0NclD)
Thank you very much for taking the time to answer these survey questions and support the health of Lake Erie. All questions and comments can be directed to Scott Hardy at Hardy.116@osu.edu or Jill Bartolotta at Bartolotta.2@osu.edu.

This survey is for a research project being conducted by Ohio Sea Grant, a statewide program that supports greater knowledge and stewardship of Lake Erie and the Great Lakes through research, education and outreach. It is part of the National Oceanic and Atmospheric Administration (NOAA) Sea Grant College Program, which includes 32 state programs located in every coastal and Great Lakes state and Puerto Rico. Support of Ohio Sea Grant is provided by NOAA Sea Grant, the State of Ohio, The Ohio State University, Ohio State University Extension, and participating universities, agencies, and businesses. Funding for this survey and the social marketing campaign is being provided by the NOAA Marine Debris Program.

2016 Farm Science Review Mobile App Will Offer Users Helpful Show Information
By Tracy Turner

An app that allows users access to the complete schedule and maps for this year’s Farm Science Review Sept. 20-22 at the Molly Caren Agricultural Center in London, Ohio, has been launched. The app is an electronic version of the farm trade show program, said Matt Sullivan, assistant manager of the Review, which is sponsored by the College of Food, Agricultural, and Environmental Sciences at The Ohio State University. “The app allows visitors to locate exhibitors and find educational seminars. It can be used all year long as a resource for Farm Science Review information,” he said. “Visitors can set up a schedule when they attend the FSR to make sure they do not miss any demonstrations, events or seminars.”

The Farm Science Review app, which is available for both Apple and Android smartphone and tablet users, includes comprehensive maps and general exhibitor and show information, Sullivan said. With the app, users can:
* View the complete show schedule and create a personal schedule.
* Set reminders before specific sessions start.
* View detailed session information, including speaker bios.
* Provide feedback on sessions.
* View a show map.
* Locate food vendors.
* View exhibitor information.
* Connect with Farm Science Review on Facebook and Twitter.

The Farm Science Review app will be available by download in the Apple App Store or the Google Play Store by searching for “FSR 2016,” or by directing your mobile browser to fsr.osu.edu and clicking on the visitor tab.

Held annually each September, the Review offers visitors some 180 educational presentations and opportunities presented by educators, specialists and faculty from OSU Extension and the Ohio Agricultural Research and Development Center, which are the outreach and research arms, respectively, of the college Advance tickets for the Review are $7 at all OSU Extension county offices, many local agribusinesses and online at fsr.osu.edu/about/online-ticket-purchase-information. Tickets are $10 at the gate. Children 5 and younger are admitted free. More information about Farm Science Review is at fsr.osu.edu.

Bus Trip to Farm Science Review
By WI Miller and Sons

We will be taking an Anderson bus to the Farm Science Review in London, Ohio. We will leave W.I. Miller & Sons farm at 4:00 AM Wednesday, September 21st and return by 11:00 PM that evening. The cost of the trip is $50 per person which includes the bus ride, admission to the Farm Science Review, and dinner at Dutch Heritage of Bellville on the way home. Breakfast will be on your own with a stop planned at McDonalds. Call 330-876-6573 to reserve a seat on the bus.
Current Hay Conditions in Ohio
By: Maurice L. Eastridge, Department of Animal Sciences - The Ohio State University

The weather conditions have been variable in Ohio this summer. Some areas have been extremely dry and other areas have been very wet during the past two to three months. Thus, hay yield and quality are quite variable across Ohio. For those areas that have been very dry, yields have been adversely affected, even though the quality of the hay harvested may be rather good. For the areas that have been wet, it has been very difficult to get the second and three cutting harvested. Thus, even though yields may be respectable, quality has been adversely affected. Therefore, many livestock farmers in Ohio need additional hay for the winter. In some cases, they need to purchase hay of higher quality than they have on hand. Now is the time to make such purchases as the last cuttings of the year are occurring and before prices creep up post harvest as supply diminishes with ample demand.

Some resources are provided in this article that you may find useful in locating hay or determining the prices for which to buy or sell. A couple of sources of hay include Farm and Dairy’s hay listing (http://www.farmanddairy.com/markets/ohio) and the online listing by state with Hay Exchange (http://www.hayexchange.com/oh.php). Many areas have local auctions for hay, but a few of the larger auctions in Ohio are the Kidron and Mt. Hope Auctions listed in Table 1. As noted, prices are quite variable, caused primarily by quality and demand. The USDA Ag Market News also provides current prices for hay in several areas of the US, including New Holland, PA (Table 1).

Pricing of hay
The value of hay demands on its nutrient composition and balance of supply and demand. The prices in Table 1 are affected by each of these aspects. In each issue of the Buckeye Dairy News (BDN) (http://dairy.osu.edu/newsletter/buckeye-dairy-news) an article is provided that provides the predicted value of feeds based on chemical composition and current prices of commodities, including the predicted price for alfalfa hay of varying quality. For example, in the July 2016 issue of BDN, alfalfa hay was priced at $190 (16% CP, 48% NDF) to $236/ton (24% CP, 32% NDF). Based on the July prices for nutrients published in the BDN, the following associations were made that can be used for pricing hay based on quality:

1) Composition of CP and NDF (DM basis): $/Ton (as-fed) = (6.89 * %CP) + (2.51 * %NDF), e.g. hay with 18% CP and 35%NDF = (6.89 * 18) + (2.51 * 35) = $212/ton
2) Relative Feed Value: RFV * 1.96, e.g. hay with RFV of 140 = 140 * 1.96 = $274/ton

These price estimates are based on primarily the nutritional value of the hay based on current prices for commodities as of the end of July 2016. Of course, these commodity prices are influenced my market pressures. Yet, as the market prices change for the appraisal set of commodities used, these equations will be invalid to use.

Also, as farmers buy and sell hay, it is helpful to know the expected quality measures relative to the hay available. Therefore, the average, range, and standard deviation for alfalfa, mixed mostly legume, mixed mostly grass, and grass hay analyzed during the 12 months prior to April 30, 2016 at the Dairy One lab in Ithaca, NY have been provided in Table 2. You will note that the variations for DM are rather low, but the variations increase with the other variables, some of them being quite high. As expected, the variation is higher for the mixed hay in comparison to the alfalfa or grass hay.

As we reach mid-September, the window for harvesting hay narrows, especially for alfalfa to give it an opportunity to build root reserves before winter. Even for harvesting grass hay, it becomes difficult to get it dry with the heavy dews, shorter days, and intermittent fall showers. So the merchandizing of hay is at a prime time to meet the needs of the buyer and the availability from the seller. Following the local and reported market conditions and the possible upper value based on the equations in this article can provide a negotiating range for the seller and buyer to make a deal. Although supply is almost set for local hay, the demand can change and always consider the options of buying western hay.
Table 1. Recent prices for hay in northeast Ohio and southeast Pennsylvania.

<table>
<thead>
<tr>
<th>Market/Item</th>
<th>Price ($/ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Kidron Auction, August 25</strong>&lt;sup&gt;1&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>First cutting hay</td>
<td>230-250</td>
</tr>
<tr>
<td>Second cutting hay</td>
<td>250-310</td>
</tr>
<tr>
<td>Third cutting hay</td>
<td>260-350</td>
</tr>
<tr>
<td>Large hay bales</td>
<td>70-80</td>
</tr>
</tbody>
</table>

| **Mt. Hope Auction, August 31**<sup>2</sup> |           |
| Alfalfa, second cutting | 250-325 |
| Alfalfa, third & fourth cutting | 175-400 |
| Mixed hay, first cutting | 50-250 |
| Mixed hay, second cutting | 250-325 |
| Large bales | 30-270 |

| **New Holland, PA (wk of Aug 29)**<sup>3,4</sup> |           |
| Alfalfa |           |
| Large alfalfa hay bales | 140-145 |
| Small squares |           |
| Premium | 230 |
| Fair | 90 |
| Alfalfa/grass |           |
| Large squares |           |
| Supreme | 225-250 |
| Premium | 180-205 |
| Fair | 105-125 |
| Small squares |           |
| Supreme | 300 |
| Premium | 210-250 |
| Grass |           |
| Large squares |           |
| Premium | 150-200 |
| Good | 120-170 |
| Fair | 80-125 |
| Small squares |           |
| Premium | 250-320 |
| Good | 140-195 |
| Fair | 80-125 |

<sup>1</sup>Kidron Auction, Kidron, OH; [http://www.kidronauction.com](http://www.kidronauction.com)
<sup>2</sup>Mt. Hope Auction, Mt. Hope, OH; [http://www.mthopeauction.com/](http://www.mthopeauction.com/)
<sup>4</sup>Alfalfa quality guidelines: Supreme = > 22% CP, < 27% ADF, < 34% NDF, and > 185 RFV; Premium = 20-22% CP, 27-29% ADF, 34-36% NDF, and 170-185 RFV; Good = 18-20% CP, 29-32% ADF, 36-40% NDF, and 150-170 RFV; Fair = 16-18% CP, 32-25% ADF, 40-44% NDF, and 130-150 RFV. Grass quality guidelines: Premium = > 13% CP, Good = 9-13% CP, and Fair = 5-9% CP.

Table 2. Average composition of legume and grass hay during the past year (range; standard deviation).<sup>1,2</sup>

<table>
<thead>
<tr>
<th>Forage</th>
<th>% DM</th>
<th>% CP</th>
<th>% NDF</th>
<th>RFV</th>
<th>RFQ</th>
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<tbody>
<tr>
<td>Legume hay</td>
<td>90.2</td>
<td>21.5</td>
<td>39.4</td>
<td>156</td>
<td>146</td>
</tr>
<tr>
<td></td>
<td>(88.9-91.6; 1.3)</td>
<td>(19.0-24.0; 2.5)</td>
<td>(34.4-44.5; 5.0)</td>
<td>(130-182; 26)</td>
<td>(116-175; 29)</td>
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</table>
Mixed hay, mostly legume

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Range</th>
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<tbody>
<tr>
<td>DM</td>
<td>90.3</td>
</tr>
<tr>
<td>CP</td>
<td>19.9</td>
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<tr>
<td>NDF</td>
<td>46.0</td>
</tr>
<tr>
<td>RFV</td>
<td>133</td>
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<tr>
<td>RFQ</td>
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Mixed hay, mostly grass

<table>
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<th>Range</th>
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<tbody>
<tr>
<td>DM</td>
<td>91.4</td>
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<tr>
<td>CP</td>
<td>13.7</td>
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<tr>
<td>NDF</td>
<td>58.6</td>
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<tr>
<td>RFV</td>
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<tr>
<td>RFQ</td>
<td>128</td>
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Grass hay

<table>
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<th>Percentage</th>
<th>Range</th>
</tr>
</thead>
<tbody>
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<td>DM</td>
<td>92.0</td>
</tr>
<tr>
<td>CP</td>
<td>11.5</td>
</tr>
<tr>
<td>NDF</td>
<td>61.4</td>
</tr>
<tr>
<td>RFV</td>
<td>92</td>
</tr>
<tr>
<td>RFQ</td>
<td>121</td>
</tr>
</tbody>
</table>


2Abbreviations: DM = dry matter, CP = crude protein, NDF = neutral detergent fiber, RFV = relative forage value, and RFQ = relative forage quality.

2016 Corn Silage Crop in Ohio
By: Maurice Eastridge and Bill Weiss, Department of Animal Sciences - The Ohio State University

The weather conditions have been variable in Ohio this summer. Some areas have been extremely dry and other areas have been very wet during the past two to three months. Thus, corn silage yields will likely be quite variable across Ohio this year. For those areas that have been very dry, yields will be adversely affected, but generally the concentrations of protein and energy will be better than average. Therefore, many dairy farmers in Ohio may need to purchase additional corn for silage or identify other ingredients to replace corn silage in the diet. Now is the time to make such decisions while some corn may still be standing in the field, other forages are readily available, and commodities will be less expensive near harvest time.

Harvesting Corn Silage

Chop at the correct dry matter (DM) concentration. The factor primarily responsible for obtaining a good fermentation is the DM concentration of the plant when chopped. This is the same whether it is a beautiful, record breaking corn crop or a severely drought stressed field with short plants containing no ears. Chopping corn silage at the wrong DM concentration will increase fermentation losses and reduce the nutrient value of the silage. The recommended ranges for silage DM are:

Bunker: 30 to 35%
Bag: 32 to 38%
Sealed upright: 35 to 38%

Drought-stressed corn plants are often much wetter than they appear, even if the lower plant leaves are brown. Before starting to chop, sample some plants (cut at the same height as they will be with the harvester) and either analyze DM using a Koster tester or microwave or send to a commercial lab (turn-around time may be a few days if you send it to a lab). If the plants are too wet, delay chopping until the desired plant DM is reached. By delaying harvest, the plant may continue to accumulate DM (increase yield), and you will not suffer increased fermentation losses caused by ensiling corn that is too wet.
Use a proven inoculant. When silage is worth upwards of $80/ton (35% DM), reducing shrink by 2 percentage units has a value of about $2/ton. Homolactic inoculants (these are the 'standard silage inoculants') produce lactic acid which reduces fermentation losses but sometimes can increase spoilage during feedout. The \textit{buchen}eri inoculants increase acetic acid which slightly increases fermentation losses but greatly reduce spoilage during feedout. Severely drought-stressed corn can have a high concentration of sugars because the plant is not depositing starch into the kernels. High sugar concentrations can increase spoilage at feed out because it is a food source for yeasts and molds. Use of a good (from a reputable company with research showing efficacy) \textit{buchen}eri inoculant may be especially cost-effective with drought-stressed corn.

Check for nitrates. Because of the growing season this year, the risk of nitrate accumulation is not extremely high, but you should still test silage from drought-stressed corn plants. Ideally, corn plants should be sampled and assayed for nitrates prior to chopping (most labs offer very rapid turn-around times for a nitrate assay). If values are high, raising the cutting height will reduce nitrate concentrations in the silage because the bottom of the stalk usually has the highest nitrate concentrations. However, do not raise the cutting height unless necessary to reduce nitrate concentrations because this will reduce yield. Nitrate concentrations are often reduced during silage fermentation so that high nitrates in fresh corn plants may end up as acceptable concentrations in the fermented corn silage. Silage with more than 1.5% nitrate (0.35% nitrate-N) has a high risk of causing nitrate toxicity in cattle. The yellow or brown gas you might see coming from a silo a day or two after filling is a result of the conversion of nitrates to other compounds. \textbf{CAUTION} - this gas is very toxic to humans and animals.

Chop at correct particle length. Do not chop the corn too finely such that the effective fiber concentration of corn silage is reduced. If the corn plants have limited ear development, fine chopping is not needed for good starch digestibility. Generally a theoretical length of cut (TLC) of about ½ inch is acceptable (longer with kernel processing and BMR silage), but this varies greatly between choppers and crop moisture concentration. If using a Penn State particle size sieve, aim for 5 to 10% on the top screen at the time of chopping.

Reduce Shrink. Fill quickly, pack adequately, cover, and seal the silo as soon as you are done chopping. Practicing good silage-making techniques can reduce shrink by more than 5 percentage units, which can be worth more than $4/ton of corn silage (35% DM).

Additional recommendations on harvesting corn silage are available on the eXtension web site in the dairy cattle section where feature articles have been posted on forages and other topics: \url{http://articles.extension.org/pages/71253/dairexnet-feature-article-series}. Delaying the feeding of the silage for about 60 days will increase the digestibility of the silage, and thus optimize animal performance from consuming the silage. If the harvest of the corn is delayed and frost occurs, frosted corn can still be a valuable feed, but you have to be careful with the rapid dry-down to harvest the silage at the proper DM.

\textbf{Pricing Corn Silage}

The price for corn silage depends on its nutrient composition and the price of other feed ingredients in the market. In each issue of the Buckeye Dairy News (BDN) (\url{http://dairy.osu.edu/newsletter/buckeye-dairy-news}), an article is provided that provides the predicted value of feeds based on chemical composition and current prices of commodities, including the predicted price for corn silage. For example, in the July 2016 issue of BDN, corn silage was reported at an actual price of $46/ton but having a predicted price of $78/ton (95% confidence interval of $68 to 88/ton). Some articles are available on the OSU dairy web site for pricing standing corn for silage and for pricing drought-stressed corn for silage: \url{http://dairy.osu.edu/resources/feeding-and-nutrition}. 
However the ultimate determinant of price is still supply and demand in a local market (corn silage cannot be transported long distances). If a local area has a lot of corn that is not worth harvesting for grain, the price of the standing corn may be substantially less than its nutrient value.

**Dietary Replacement of Corn Silage**

Corn silage is certainly a valuable ingredient in diets for dairy cattle. It is a very efficient crop to grow in Ohio, and it provides valuable energy and fiber usually at bargain prices in diets of high-producing dairy cows. Typical chemical composition of corn silage is provided in Table 1. Some strategies for stretching the supply of corn silage or replacing it in diets are as follows:

1) Reduce the amount of corn silage in the diet to stretch the supply by increasing the inclusion level of high-quality legume or grass hay or silage.

2) You can stretch the supply of corn silage by removing it from rations for the growing heifers and dry cows and feeding them all hay or haycrop forages.

3) All of the corn silage in the diet of the lactating cows can be removed and effective fiber and nutrients balanced using other high-quality forages and concentrates. Some University of Georgia researchers several years ago advocated the feeding of up to 10 to 15 lb/day of an artificial corn silage consisting of 40% soybean hulls, 30% cottonseed hulls, 25% ground corn, and 5% cottonseed meal. This results in a mixture with the composition of 11.9% CP, 53.5% NDF, 19% starch, and about 0.63 NE\textsubscript{L}/lb. Given that soybean hulls have been overpriced for quite some time (see latest issue of BDN mentioned above), wheat middlings was used to formulate a different mixture consisting of 40% wheat middlings, 34% cottonseed hulls, and 26% ground corn (11.9% CP, 45.9% NDF, 19.7% starch, and 0.64 NE\textsubscript{L}/lb). Caution is expressed in using cottonseed hulls in OH due to their cost; presently, they are only valued at $23/ton using the nutrient values published in the July BDN. However, the bottom line on this approach is to work with your dairy nutritionist so a diet can be formulated without corn silage that can provide the nutrient supply needed, keep the rumen healthy, and not limit intake of the animal. Then you will want to monitor animal performance with the new feeding strategy so adjustments can be made if necessary.

With variable weather conditions throughout the State, composition of corn silage will likely be quite variable in Ohio this year. Thus, as usual, multiple samples will need to be analyzed so diets can be adequately formulated. Hopefully, yield of corn and soybeans will be good which will help to keep feed prices moderated. At the moment, milk prices are low and on the bubble, hopefully tipping upward. So carefully monitoring income over feed costs will be pivotal in the upcoming months. You and the nutritionist will need to be on each other’s speed dial.

<table>
<thead>
<tr>
<th>Item</th>
<th>Average</th>
<th>SD</th>
<th>CV (%)</th>
<th>Typical Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM, %</td>
<td>33.7</td>
<td>9.3</td>
<td>27.6</td>
<td>24.4 – 43.0</td>
</tr>
<tr>
<td>CP, % of DM</td>
<td>8.27</td>
<td>1.06</td>
<td>12.8</td>
<td>7.21 - 9.32</td>
</tr>
<tr>
<td>Starch, % of DM</td>
<td>31.8</td>
<td>7.5</td>
<td>23.6</td>
<td>24.3 – 39.3</td>
</tr>
<tr>
<td>ADF, % of DM</td>
<td>25.8</td>
<td>4.1</td>
<td>15.9</td>
<td>21.7 – 29.9</td>
</tr>
<tr>
<td>NDF, % of DM</td>
<td>43.6</td>
<td>5.9</td>
<td>13.5</td>
<td>37.7 – 49.6</td>
</tr>
<tr>
<td>NDFD 30 hr, % of NDF</td>
<td>52.5</td>
<td>6.1</td>
<td>11.6</td>
<td>46.4 - 58.6</td>
</tr>
</tbody>
</table>

\textsuperscript{1}DM = dry matter, CP = crude protein, ADF = acid detergent fiber, NDF = neutral detergent fiber, NDFD = NDF digestibility, SD = standard deviation, and CV = coefficient of variation ((SD/average) * 100).

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Northeast Ohio Agriculture

OHIO STATE UNIVERSITY EXTENSION
Ashtabula and Trumbull Counties
Perennial Crops for Bioenergy & Ecosystem Services

Offered by Penn State Extension in partnership with Penn State Biomass Energy Center and the NEWBio bioenergy consortium, Designing Sustainable, Working Landscapes with Perennial Crops for Bioenergy & Ecosystem Services will provide an in-depth look at opportunities for the use of perennial biomass crops in accomplishing conservation and rehabilitation goals on a landscape scale. **Registration Deadline:** Thursday, October 13, 2016

- **When**
  - October 26 (1:00 - 4:30 p.m.)
  - October 27 (8:20 a.m. - 4:00 p.m.)
- **Where**
  - The Penn Stater Conference Center
  - 215 Innovation Blvd
  - State College, PA 16803

Though difficult to quantify in dollars, vegetative ecosystem services such as water filtration, carbon storage, erosion and runoff prevention, wildlife habitat, recreational opportunities, and scenic beauty provide extraordinary value to society. Perennial vegetation in the form of biomass crops that reach bioproduct and biofuel markets are becoming more of an option for farmers, landowners, and land managers, and they can also supply these ecosystem services. Many of these crops exhibit conservation or site rehabilitation value, introducing new opportunities for simultaneous economic and environmental benefits.

This short course provides an in-depth look at opportunities for the use of perennial biomass crops, including grasses and short-rotation woody crops, in accomplishing conservation and rehabilitation goals on a landscape scale. Presentations, panels, and discussion sessions feature leading researchers, agency representatives, and industry professionals in the field.

Click here for registration details: [http://www.cvent.com/events/perennial-crops-for-bioenergy-ecosystem-services/event-summary-811f13ecfa1842bfb0c5403f459b8a55.aspx](http://www.cvent.com/events/perennial-crops-for-bioenergy-ecosystem-services/event-summary-811f13ecfa1842bfb0c5403f459b8a55.aspx)

**David's Weekly News Column - Scouting Weeds in Soybean**

Published on September 14, 2016 in the Jefferson Gazette & September 18, 2016 in the Star Beacon

Hello, Ashtabula County! Harvest time is underway in Ashtabula County. Over the past ten days, a lot of corn silage has been chopped and put safely away in our silos and bunks. I am hearing great yields for this year’s corn silage harvest which is a real blessing given the yields from the past two years. There are going to be a lot of happy cows this winter as they eat this high quality corn silage.

This week, I drove a 100-mile loop around the county to determine the weeds which are the most prevalent in our local soybean fields. OSU Extension Educators from most every
count in the state are completing this survey this month as there is an increasing level of concern of soybean weed management practices across Ohio. As I drove across the county, I noticed a lot of Common ragweed, Common lambsquarters, and our newest nemesis weed- Marestail in our soybean fields. The populations of these weeds are growing in leaps and bounds as they are becoming more resistant to the herbicides which our farmers and cooperatives are using. According to the United Soybean Board there are 143 weeds that have shown resistance to herbicides in the United States.

Weed control is an essential part of all crop production systems. Weeds can reduce crop yields by competing with crops for water, nutrients, and sunlight. They also reduce profits by hindering harvest operations, lower crop quality, and may produce chemicals which are harmful to crop plants. Weeds can also harbor insects and diseases and produce seed or rootstocks which infest the field and affect future crops. Despite large expenditures for weed control, it is estimated that losses in U.S. crops due to weeds left uncontrolled exceed $8 billion each year. That folks is a lot of money!

So what should farmers be doing now to help themselves next year? It is well worth the time for farmers to jump in their farm truck and do a scouting loop of their fields. Wear some comfortable shoes and walk your fields to see which weeds were crafty enough to escape control by tillage, cultural practices, or through the use of chemicals.

To get a good representation of the weeds present, we recommend that scouts walk in an X or a W pattern to cover the whole field. In my 100 mile scouting trip, each field was rated either a 0, 1, 2, or 3 for each of the most common weeds we have in Ashtabula County. A zero rating indicated it was a clean field with relatively no weeds apparent. A rating of 1 indicated that an occasional weed plant or plants were observed in the field. A rating of 2 signified there were large patches of a weed or weeds in the field. A patch in our state scouting study meant that 8 or more plants of an individual weed were found. And finally a rating of 3 meant the weed or weeds were widespread with numerous patches or individual patches of the weed across the field. A 3 rated field is very easy to identify as you drive by as you may question if there are more weeds than soybeans in the field!

Scouts should keep records of their scouting to indicate where exactly a problem was identified, how common the problem was, how damaging the problem was and what, if any, control measures were utilized in 2016. It is important to note the hotspots so you can make sure to address the problem and then re-evaluate the results.

The scouting reports can then be used to design a weed management plan for each field. This plan might mean that a chemical application is needed right after the soybeans are harvested this fall. This is especially crucial with Marestail as each plant can produce up to 200,000 seeds. Once you have a good scouting report, you will have plenty of time this winter to analyze your alternatives for control at our winter agronomy schools.

Last year as I was cutting hay, I was alarmed how much Canada Thistle and Dock was spreading in the field. By scouting, I made a list of the hot spots and as Western Reserve was feeding the grass a boost of nitrogen in April, we were able to mix in the needed chemicals to really suppress these two nasty weeds. This allowed us to dry the hay quicker as weeds take longer to dry. Because we were able to eliminate the weeds, it increased the quality of the hay.

For farmers who are rusty on their weed identification, we have an excellent resource which they can purchase in our office. This book is titled the “Weeds of the Northeast.” This is one of the nicest weed books that you will find. It has almost 400 pages of color photos and descriptions of the most common weeds we have in Ashtabula County. We have a few copies of this book on hand at the Ashtabula County Extension office and it
sells for $35.76. You can also find it on-line at places like Amazon. This is a must-have for our farmers. Maybe it is an ideal birthday or Christmas present?

So I wish everyone happy scouting! I would like close today’s column with a thought from Henry Ward Beecher who stated, “We are always on the anvil; by trials God is shaping us for higher things.” Have a good and safe day!

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