Hello Northeast Ohio Counties!

Much of the soybean harvest wrapped up last week in the region. With the wet weather this week, it may be a few more days before the corn harvest begins in full swing.

New this year, OSU Extension Trumbull County will be offering Corn Harvest Coffee! Lee will be delivering hot coffee to combines in the field. Stay tuned for more details!

Have a great week!
First Widespread Freeze Arrives; Wetter Pattern Set In

By: Aaron Wilson
Source: https://agcrops.osu.edu/newsletter/corn-newsletter/2020-36/first-widespread-freeze-arrives-wetter-pattern-sets

Much of Ohio experienced frost or freeze conditions this past Friday and/or Saturday night. In fact, many locations dropped below 30°F (Table 1), with unofficial observations as cold as 26°F! How does this compare to typical first freeze dates?

<table>
<thead>
<tr>
<th>Location</th>
<th>County</th>
<th>Minimum Temperature (°F)</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warren (3mi S)</td>
<td>Trumbull</td>
<td>27</td>
<td>2020-10-18</td>
</tr>
<tr>
<td>Bryan (2mi SE)</td>
<td>Williams</td>
<td>28</td>
<td>2020-10-18</td>
</tr>
<tr>
<td>Waterloo</td>
<td>Lawrence</td>
<td>28</td>
<td>2020-10-17</td>
</tr>
<tr>
<td>Logan</td>
<td>Hocking</td>
<td>28</td>
<td>2020-10-18</td>
</tr>
<tr>
<td>Zaleski</td>
<td>Vinton</td>
<td>28</td>
<td>2020-10-17</td>
</tr>
<tr>
<td>Dennison Water Works</td>
<td>Tuscarawas</td>
<td>29</td>
<td>2020-10-18</td>
</tr>
<tr>
<td>New Lexington (2mi NW)</td>
<td>Perry</td>
<td>29</td>
<td>2020-10-18</td>
</tr>
<tr>
<td>Zanesville Mun. AP</td>
<td>Muskingum</td>
<td>29</td>
<td>2020-10-17</td>
</tr>
<tr>
<td>Greenville Water Plant</td>
<td>Darke</td>
<td>30</td>
<td>2020-10-16</td>
</tr>
<tr>
<td>New Carlisle</td>
<td>Clark</td>
<td>30</td>
<td>2020-10-18</td>
</tr>
</tbody>
</table>

Figure 1 shows the climatological median date (50th percentile; 1980-2010) occurrence for the first 32°F in the fall. Ohio’s dates vary widely, as early as the last week in September in some of the colder valleys of the northeast hills (light blue) to as late as the first week of November (brown) in the far east. However, much of Ohio experiences first freeze during the second and third weeks of October. So, this year’s first freeze appears to be right on schedule across the north and a bit early for areas of southern and southwest Ohio.

Figure 1: Climatological date of median first 32°F freeze for the years 1980-2010. The median is defined as the 50th percentile.
Forecast

A stalled boundary is currently draped across Ohio. This boundary is providing a focus for shower activity, bringing the heaviest widespread rainfall that we have seen in Ohio since Labor Day. CoCoRaHS observations show that 0.5-1.25” of rain has fallen in the last 24 hours, with additional rain showers expected Monday night into Tuesday morning. This frontal boundary will lift north of the region by Wednesday afternoon, but not before providing the opportunity for additional showers through Wednesday morning. Highs will warm into the mid to upper 70s for mid to late week, perhaps even low 80s across the south on Thursday, with dry conditions expected through Friday morning. A strong cold front will approach the region on Friday, bringing a line of showers and storms through late in the day. Behind this front, much cooler air will filter back into the region, with highs in the 50s and 60s and overnight lows in the 30s and 40s expected this weekend. The weekend should remain dry before damp, chilly conditions return early next week. The Weather Prediction Center is currently forecasting 0.50-1.25” of rain across most of Ohio for the next 7 days, with greatest totals in the far southwestern counties (Fig. 2).

Figure 2: Forecast precipitation for the next 7 days. Valid from 8 p.m. Monday October 19, 2020 through 8 p.m. Monday October 26, 2020. Figure from the Weather Prediction Center.

The latest NOAA/NWS/Climate Prediction Center outlook for the 8-14 day period (October 27 – November 2) shows below average temperatures and above average precipitation are likely (Fig. 3). Normal highs during the period are in the upper-50s to low-60s, lows in the upper-30s to low-40s, with about 0.85” of rainfall per week.

Figure 3: Climate Prediction Center 8-14 Day Outlook valid for October 27 – November 2, 2020 for left) temperatures and right) precipitation. Colors represent the probability of below, normal, or above normal conditions.
PROPOSED EPA CHANGES TO ADDRESS RESISTANCE RISKS FOR CATERPILLAR PESTS IN BT CROPS OPEN FOR COMMENT UNTIL NOVEMBER 9

By Kelly Hamby and Galen Dively, University of Maryland, Department of Entomology

Insect Resistance Management in Bt Crops: Transgenic crops expressing insecticidal toxins sourced from *Bacillus thuringiensis* (Bt) bacteria reduce yield loss and insecticide use, delivering economic benefits for growers. Because this breakthrough in pest management is considered a public good and insect resistance is the largest threat to Bt crops’ durability, insect resistance management programs were developed and mandated by the EPA prior to the release of Bt crops. These plans included planting untreated refuge crops at high enough acreage to produce many susceptible adult insects that could interbreed with and dilute the resistance from insects surviving Bt crops (Figure 1).

![Figure 1. Susceptible (white) corn borers emerge from the untreated block refuge (yellow) planted on the side of the Bt field (green). Resistant (red) corn borers emerge from the Bt field (green) and interbreed with susceptible moths to produce moths with diluted (white and red) resistance genes.](image)

In addition, crops were supposed to express Bt toxins at a high enough dose that insects with diluted resistance genes (white and red) would be killed, called a “high dose” strategy. Finally, pyramided hybrids that contain multiple toxins targeting the same pest were developed to make it more difficult for pests to overcome the toxins.
EPA also required monitoring for insect resistance and mitigation strategies to implement once resistance was detected.

The Issue: When best management practices for Bt insect resistance management are followed, for example, European corn borer (*Ostrinia nubilalis*) management in the U.S., resistance development has been slowed. In fact, all single and pyramided Bt traited corn hybrids still provide 100% control of corn borers. However, for some pests [corn earworm (*Helicoverpa zea*) and Cry toxins] Bt toxins were less effective and products were not high dose. This issue was further compounded by poor refuge compliance, which lead to the development of refuge-in-a-bag (RIB) seed mixes to increase refuge acreage. This technology was designed based on corn rootworm biology and is not as good as a separate block refuge for most other target pests. Finally, while pyramided multi-toxin hybrids were developed, hybrids that contained a single effective toxin for the management of some pests continued to be marketed. This enables insects to develop resistance to a single toxin first providing a “stepping stone” to resistance in pyramided hybrids that contain the same or similar toxins because they can already survive on some of the toxins that are being expressed. In addition, the same Bt toxins are used in both corn and cotton, so corn earworm (also known as bollworm) goes through multiple generations of selection pressure in the same year, increasing resistance. Reports of caterpillar pests resistant to Bt corn and cotton in the U.S. have occurred since 2014 for fall armyworm, since 2016 for corn earworm, and since 2017 for western bean cutworm. However, none of these resistance reports triggered EPA’s current regulatory definition of pest resistance and no mitigation actions were taken. Therefore, the EPA released a draft document outlining proposed changes to reduce resistance risks (especially for non-high dose pests at heightened risk of resistance), to increase the longevity of currently functional Bt traits and future technologies, and to improve the current caterpillar pest (Lepidopteran) resistance management program for Bt corn and cotton (USEPA 2020).

Proposed Changes: Changes build off current insect resistance management plans and incorporate feedback and recommendations developed by a July 2018 Scientific Advisory Panel, independent academic scientists, the Agricultural Biotechnology Stewardship Technical Committee, the National Alliance of Independent Crop Consultants, and Syngenta Crop Protection, LLC (USEPA 2020). The EPA has 1) confirmed Bt resistance to specific Bt toxins in corn earworm, fall armyworm, and western bean cutworm, 2) proposed a new resistance definition for non-high dose pests that acknowledges their heightened risk of resistance and enables more rapid response to unexpected injury, 3) proposed a resistance monitoring approach that will use sentinel plots to monitor unexpected injury in addition to reported cases of unexpected injury in Bt crops, 4) proposed an improved resistance mitigation strategy with best management practices to respond to unexpected injury within the growing season and moving forward, and 5) will continue to require reporting on refuge compliance,
Changes Under Discussion: In addition to the above changes, three additional changes have been proposed that require further discussion and stakeholder comment (USEPA 2020). The first focuses on reducing the acreage of products that no longer effectively manage resistant caterpillar pests and that share or have similar toxins as multi-toxin pyramided hybrids that still provide control. Therefore, the EPA is proposing a short term (~ 3 year time frame) phase down of hybrids that contain a single toxin for control of caterpillar pests, capping acreage planted in these hybrids to a minimum. These include field corn (Table 1), sweet corn (Table 1), and cotton products. In addition, non-functional pyramids that do not contain effective toxins for control of resistant caterpillar pests would have a longer term (~ 5 year time frame) phase down to minimal acreage (Table 2). Even with the potential phase downs Cry toxins will still be available for planting in pyramided hybrids that include the Vip3A trait.

To improve refuge compliance nationwide, the EPA proposes to increase refuge-in-the-bag (RIB) seed blend technologies to 10% refuge and maintain current requirements to plant a separate 20% block refuge in cotton producing areas (USEPA 2020). This should help insect resistance management for all pests managed by Bt and may be especially important for pests at heightened risk of developing resistance.

To further increase refuge compliance, especially in cotton producing areas, additional strategies have been proposed. For example, sale of Bt corn products requiring block refuge must be followed up with mandatory on-farm visits [conducted by industry (registrants)] to assess refuge compliance during the growing season, which will be conveyed to growers at the point of sale and be included in the grower insect resistance management agreement (USEPA 2020). Visits will be reported to the EPA. Farmers out of compliance with block refuge standards in cotton producing regions for one year will not be allowed to purchase Bt products, including RIB and block refuge products, for two years. Seed dealers will be required to keep grower IRM agreement records for 3 years, with audits that could result in losing the opportunity to sell Bt seed if signature rates or record keeping are noncompliant [conducted and enforced by industry (registrants)]. The industry (registrants) must ensure the availability of non-Bt elite corn hybrids for refuge plantings (USEPA 2020), which should improve the quality and yield of these plantings.

Potential Impacts to Mid-Atlantic Seed Dealers and Growers: Phase downs of single toxin and non-functional pyramid hybrids will impact hybrid availability and selection; however, these toxins (which control corn borers) will be available pyramided with Vip3A. If you are planting hybrids that require 20% block refuge (such as is the case with the single traited hybrids that are being phased out), a mandatory on-farm visit by the registrants and/or seed dealers may be required. Non-Bt elite corn hybrids
will have to be made available for block refuge and refuge-in-a-bag seed mixes which should make yield more comparable to Bt plants.

**Stakeholder Comment Period:** The EPA is soliciting comments through 11/9 seeking additional stakeholder comments from corn and cotton growers, crop consultants, academic experts, non-governmental organizations, the Bt PIP industry, and the general public regarding the changes under discussion (see above). Stakeholders can submit their comments here: [https://www.federalregister.gov/documents/2020/09/08/2020-19779/epa-draft-proposal-to-improve-lepidopteran-resistance-management-notice-of-availability](https://www.federalregister.gov/documents/2020/09/08/2020-19779/epa-draft-proposal-to-improve-lepidopteran-resistance-management-notice-of-availability)

References and Other Resources:

**Dairy Pricing, Outlook, and Risk Management Series Coming in November**
By Dianne Shoemaker

How in the world did we end up with a negative eight dollar producer price differential (PPD) in July? What do markets look like moving forward? What tools can a dairy farm use to manage price risk in the future?

These are excellent questions and the focus of a three-part mini-series for Ohio’s dairy industry coming in November. The meetings will be live via zoom, so grab
your lunch and join us on your computer or listen in from your phone from noon to one pm for any or all of these sessions:

Thursday, November 5th - **How did we get to a -$8 PPD?**
- Mark Stephenson, Director of Dairy Policy Analysis, University of Wisconsin

Tuesday, November 17th – **Dairy Fundamental Outlook and Trade**
- William Loux, Director of Global Trade Analysis, Dairy Export Council
- Mike McCully, McCully Group

Tuesday, November 24th – **Dairy Risk Management Tools**
- Kenny Burdine, Livestock Marketing and Management, University of Kentucky
- Jason Hartschuh, ANR Educator, The Ohio State University
- Chris Zoller, ANR Educator, The Ohio State University

Each session will last one hour with opportunities for questions. There is no cost for the program, but please register ahead at: [http://go.osu.edu/DairyRiskManagement](http://go.osu.edu/DairyRiskManagement). You will receive an email with information about joining the program via the Zoom platform.

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**Farming and parenting—a tough juggling act**

By Alayna DeMartini


COLUMBUS, Ohio—Raising children on a farm might sound idyllic, but in a national study, most farmers with children under 18 said childcare was a challenge. Over two-thirds of first-generation farmers, people who had not grown up on farms, reported struggles with childcare, from finding affordable options nearby to finding providers whose childrearing philosophy matched theirs.

Even multigenerational farmers, many who live near relatives, said childcare’s affordability, availability, or quality was a problem. Just over half of those farmers reported some type of childcare challenge.

“This is going to come as a surprise to a lot of people who don’t think childcare is an issue for farmers,” said Shoshanah Inwood, an assistant professor at The Ohio State University College of Food, Agricultural, and Environmental Sciences (CFAES) and the lead researcher of the study.

“Finding quality, affordable daycare affects young farmers and their ability to stay in agriculture.”
The four-year study began with a survey taken in 2014 among farmers in five metro areas: Columbus, Ohio; Burlington, Vt.; Honolulu, Hawaii; Miami, Fla.; and Portland, Maine. The metro regions were selected in part because they had a healthy agricultural sector and a higher-than-average number of small- and mid-sized farms, and they were diverse with higher-than-average numbers of women farmers and farmers of color.

Of the 654 people who responded to a written survey, 186 had children under 18 years old.

Although the surveys were taken in metropolitan areas with likely more childcare options than in rural areas, childcare still was a major challenge.

Beginning farmers often make land-purchasing decisions based on cost and proximity to markets, Inwood said. But when those decisions take them far away from relatives, that can affect the well-being of their family and productivity of their farm.

“Oftentimes there’s this romantic idea of what it is to grow up on a farm, but what people are realizing is, ‘We can’t just let the kids run around all day unsupervised,’” she said.

“There’s machinery and it’s dangerous, and it isn’t cute when you find out your child followed you down the row, plucking out the onions you just planted.” With farming being a seven-day-a-week job lasting much longer than eight hours a day, finding a childcare provider to meet that schedule can be especially difficult. While there’s an emphasis on attracting more young people into farming, they are farmers in their prime child-bearing years, Inwood said. As a result, there needs to be some help for them in planning for how they’re going to take care of their children if they decide to become parents, she said.
Farmer education is focused on helping farmers set their business goals, identifying markets, and working out the financials, Inwood said. “Nobody is talking about childcare.”

What’s left out of much of the training for farmers is a discussion about how they’re going to work out childcare if and when they decide to become parents, Inwood said.

In the second phase of the study, Inwood and Andrea Rissing, a postdoctoral researcher at CFAES, interviewed farmers who were also parents about childcare in nine Northeastern states: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

Farmers’ ability to find childcare affected their production and marketing decisions in wide-ranging and surprising ways, the researchers found.

“There are tradeoffs farm families make as they need to decide how much money and time to spend on childcare versus time and money they spend investing in growing and building their enterprise,” Inwood said.

One of the farmers interviewed lost a significant amount of income when she had to stop selling at a farmers market because she couldn’t meet the manager’s requirement that sellers arrive an hour before opening. She couldn’t get a babysitter that early.

On another farm, the wife planted crops in fields nearest their home to be as close as possible to their children, while still working. Without a babysitter, she had to prioritize being close to home over other critical factors determining a crop’s success such as the type of soil or slope of the land.

The majority of farmers interviewed said they could not scale up their farm businesses because they were limited by childcare responsibilities.

“Our interviews with young farmer-parents clearly showed that even though childcare seems like an issue confined to the farm household, it has real impacts on farm businesses as well,” Rissing said.

“So much of a farm’s success and the quality of life of the farmers is tied to these dynamics, like having family nearby and a strong support network.” Even farmers with relatives nearby couldn’t always count on their relatives to watch their children. Sometimes those relatives had jobs and other responsibilities or health issues that prevented them from being able to babysit or chauffeur kids to activities.
When the reality of raising children on a farm doesn’t meet what people had imagined it would be, parents’ stress can be infectious, Inwoo d said.

“And then what kind of example are they setting for kids about what it’s like to grow up on a farm?”

Ohio Corn, Soybean and Wheat Enterprise Budgets – Projected Returns for 2021

By: Barry Ward  
Source: https://u.osu.edu/ohioagmanager/2020/10/14/ohio-corn-soybean-and-wheat-enterprise-budgets-projected-returns-for-2021/

Production costs for Ohio field crops are forecast to be slightly lower than last year with lower expenses for fertilizer, fuel and interest. Variable costs for corn in Ohio for 2021 are projected to range from $359 to $433 per acre depending on land productivity. Variable costs for 2021 Ohio soybeans are projected to range from $199 to $220 per acre. Wheat variable expenses for 2021 are projected to range from $162 to $191 per acre.

Grain prices currently used as assumptions in the 2021 crop enterprise budgets are $3.70/bushel for corn, $9.40/bushel for soybeans and $5.70/bushel for wheat. Projected returns above variable costs (contribution margin) range from $172 to $357 per acre for corn and $222 to $404 per acre for soybeans. Projected returns above variable costs for wheat range from $179 to $314 per acre.

Return to Land is a measure calculated to sometime assist in land rental and purchase decision making. The measure is calculated by starting with total receipts or revenue from the crop and subtracting all expenses except the land expense. Returns to Land for Ohio corn (Total receipts minus total costs except land cost) are projected to range from $11 to $184 per acre in 2021 depending on land production capabilities. Returns to land for Ohio soybeans are expected to range from $109 to $282 per acre depending on land production capabilities. Returns to land for wheat (not including straw or double-crop returns) are projected to range from $95 per acre to $222 per acre.

Total costs projected for trend line corn production in Ohio are estimated to be $761 per acre. This includes all variable costs as well as fixed costs (or overhead if you prefer) including machinery, labor, management and land costs. Fixed machinery costs of $75 per acre include depreciation, interest, insurance and housing. A land charge of $195
per acre is based on data from the Western Ohio Cropland Values and Cash Rents Survey Summary. Labor and management costs combined are calculated at $71 per acre. Details of budget assumptions and numbers can be found in footnotes included in each budget.

Total costs projected for trend line soybean production in Ohio are estimated to be $522 per acre. (Fixed machinery costs: $59 per acre, land charge: $195 per acre, labor and management costs combined: $45 per acre.)

Total costs projected for trend line wheat production in Ohio are estimated to be $459 per acre. (Fixed machinery costs: $34 per acre, land charge: $195 per acre, labor and management costs combined: $43 per acre.)

Budget projections for commodity crops for 2021 have been completed and posted to the Farm Office website: [https://farmoffice.osu.edu/farm-mgt-tools/farm-budgets](https://farmoffice.osu.edu/farm-mgt-tools/farm-budgets)

**Solid Manure Spreader Calibration**
Source: [https://u.osu.edu/beef/2020/10/07/solid-manure-spread-calibration/](https://u.osu.edu/beef/2020/10/07/solid-manure-spread-calibration/)

It's that time of year when hay and/or harvested grain fields are becoming available for the application of manure nutrients. Have you ever given thought to how much manure you might be spreading per acre? If not you might be surprised by the amount you are applying, and perhaps more importantly how easy it is to determine the tonnage being applied per acre. This brief video from the recent ‘virtual’ Farm Science Review explains a simple calibration process. (Click the video below and it will take you to YouTube).
If you missed any of the ‘virtual’ sessions from the 2020 Farm Science Review, find them all archived here at your convenience: https://fsr.osu.edu/