

Auglaize County OSU Extension Weekly Agriculture Newsletter – July 15, 2020

Scouting and Latest Information



Corn



Soybean

Hello!! Good afternoon! I pray you are well!

Every Tuesday from 8:30 to 9:30 AM we will be hosting a virtual meeting via Zoom that can also act as a simple conference call for those of you not able to get online to view live. The meeting will be set up to discuss key, timely information for your operation and to open the floor for questions and sharing of information. You may propose topics for the next meeting at anytime during the week by e-mailing or calling me. **Next week is our monthly Ag Breakfast meeting. We will have Aaron Wilson speak about Climate Change and its Impact Upon Agriculture.** Please join use every Tuesday for Auglaize County Farm Talk.

If you are a buyer or seller of hay or straw, let me know and I can keep a list to share with others.

List of individuals searching for hay or straw: None

List of individuals selling hay or straw:

1. About 200 3' X 3', 2019 wheat straw bales for sale.
2. At least 500 small square wheat straw bales from 2019 for sale.

Call the OSU Extension office at 419-739-6580 or my cell phone at 701-541-0043 or e-mail me at stachler.1@osu.edu to get the contact information.

Joke: Why did the cops arrest the turkey??

Agricultural Fun Fact: For a 60 bushel per acre soybean yield there needs to be about 2 to 2.5 pods per nodes 5 to 17.

Rain fell 4 days somewhere in the county this past week. Much of the county is quite dry, but some are getting lucky! Rainfall on Wednesday, July 8th ranged from 0” at 13 locations to 1.55” near Kossuth. Rainfall Thursday ranged from 0” at 6 locations to 1.6” near Buckland-Holden and St. Rt. 501 roads. Rainfall on Friday ranged from 0.06” at Santa Fe-New Knoxville and Kettlersville roads to 0.6” near Lowe’s and Mercer Line and St. Rt. 197 roads. Rainfall on Sunday ranged from 0” at 8 locations, mostly the northern and eastern parts of the county to 1.0” near Sommers and Tri-Township roads. Rainfall for the week ranged from 0.09” at Santa Fe-New Knoxville and Kettlersville roads to 2.8” near Buckland-Holden and St. Rt. 501 roads. Rainfall for the week averaged 0.83” 0.64” more than last week. There is at least a 40% chance of rain Thursday, Saturday, and Sunday.

The average high temperature now is 84 degrees F. We have now reached our maximum temperature for the summer! Temperatures were above normal for **4** days of the week and below normal for **2** days of the week. The range in high temperature for the week was 81 to 93 degrees F. The average high temperature for the week was 86 degrees F, which is 3.6 degrees F cooler than last week, but 2 degrees F **warmer than** the current normal high temperature. Temperatures for the next 7 days will be above normal!

Wheat

As of Sunday 99% of the wheat was harvested in the county.

Alfalfa



Severe leafhopper burn



Alfalfa

A good amount of second cutting alfalfa has been completed, but not all. I'm hearing relative feed values are higher than first cutting, but protein is low and yields reduced by 25 to 50%. Leafhopper levels are through the roof yet if not harvested and/or sprayed. I counted around 100 potato leafhoppers in a ten sweep count in one field.

Corn



Most advanced corn (R1-silking)



Average stage of corn (V16)

Corn grew quickly again this past week! Crop quality was steady to slightly less than last week despite the hot and dry weather. Due to the cooler and wetter conditions for some, the corn was not rolled much on Sunday. I'm still not impressed with the crop. I rated the corn crop at 4% excellent, 36% good, 60% fair, 0% poor, and 0% very poor. Last week, I rated the corn crop at 3% excellent, 40% good, 56% fair, 1% poor, and 0% very poor. The range in corn is from V7 (seventh collar visible) to R1 (silking) stage. Most corn is at the V16 (sixteenth collar) to V17 (seventeenth collar) stage. About 12% of the crop was in the tassel stage. No leaf diseases present at this time. I saw some Japanese beetles in a few fields, but at very low levels. Non-Bt corn needs to be scouted for western corn rootworm beetles as I found them in two fields with one field having silk clipping occurring. I'm seeing nitrogen and potassium deficiencies in some fields. My biggest concern for some fields is the timing of pollination. I saw one field where some plants had already shed all of its pollen and no silks had emerged yet.

Soybean



Most developed soybean (R3)



Field of soybean



Average stage of soybean (R2)



Youngest stage of soybean (VC)

All soybeans are planted now and the double crop soybeans are emerging much better than I had anticipated. The soybean crop improved again this week despite the hot and dry conditions! The current condition of soybean in the county is 22% excellent, 53% good, 22% fair, 3% poor, and 0% very poor. Last week's crop condition was 23% excellent, 48% good, 28% fair, 1% poor, and 0% very poor. The range in soybean stage is

from VC (first node visible) to R3 (pods forming on one of 4 upper nodes of plant) stage, but most are at R2 (full flower). I found no leaf diseases. I did find more red-headed flea beetles white flies, thrips and potato leaf hoppers again this week. I did find some defoliation occurring at very minor levels in some fields, but could not find the insect causing the damage. I did see a field of soybean on Monday with probably 5% defoliation from Japanese beetles, so they are finally starting to show up in larger numbers. The biggest concern is I found spider mites for the first time! I found two spider mites on one leaf on one plant in one field. I found more fields where the soybeans are deficient in potassium. I also found some fields with significant patches of manganese deficiency.

Weeds



Waterhemp surviving soybean herbicides

Almost no herbicides can be used on corn now due to the stage and/or height of the corn! Waterhemp is starting to show up in soybean fields that were not completely controlled by the first herbicide application. Get out and scout fields for survivors and /or new germination. There are few herbicides that can be applied to soybean now due to it's stage of development. The group 15 herbicides, glufosinate, dicamba, and fomesafen can no longer be applied to soybean, other than very late planted soybean.

Insects/Other

I found the first western bean cutworm moth in a trap on Sunday. I caught one moth in one of four traps. The moth was found in my northwest corner of the county field. There were no western bean cutworm moths in any of the four traps the week before.

With the cancellation of dicamba products applied to dicamba soybean, I did not update the label information below. Not sure of label changes for Tavium (<http://www.syngenta-us.com/herbicides/tavium-tank-mixes>) this week. With the end of Engenia, FeXapan, and XtendiMAX, I deleted the tank-mix information, but since Tavium is still legal, I kept that. There are 47 herbicides, 101 DRA's, 316 adjuvants, 96 nutritionals, 16, insecticides, 7 fungicides, 8 other products, and 41 nozzles approved for use with Tavium.

Enlist One and Enlist Duo for Enlist soybeans and corn also have approved tank-mix partners and nozzles like the dicamba products. **There were no changes to the labels this week!** The list of approved tank-mixtures for both of these products has been updated. Please follow these labels online at <https://www.enlist.com/en/herbicides.html> . There are 48 nozzles, 153 herbicides (10 new ones), 20 glyphosate formulations (1 new one), 10 glufosinate formulations (1 new one), 11 Dry AMS products, 85 insecticides, 30 fungicides, 21 plant growth regulators, 645 other products, and 315 fertilizers / nutrients labeled with Enlist One. There are 23 nozzles, 89 herbicides (15 new ones), 51 insecticides (3 new ones), 17 fungicides, 22 plant growth regulators, 8 Dry AMS products, 512 Other products, and 168 fertilizers / nutrients labeled with Enlist Duo.

Other information about the Enlist products include the following:

1. Enlist Duo rate is 4.75 pts/A which only has 1.0 lbs ae/A of glyphosate which is really not enough. You would think you could just add more glyphosate, but you CAN NOT add more glyphosate with Enlist Duo.
2. Enlist One can be mixed with ANY rate of glyphosate, glufosinate and 192 other herbicides.
3. Never use Enlist One alone on Enlist crops and always apply Enlist One at 2 pts/A
4. You CAN NOT add glufosinate with Enlist Duo!
5. When adding a postemergence grass soybean herbicide like quizalofop, clethodim, sethoxydim, or fluazifop to Enlist One add 33% higher rate of these products to reduce the antagonism with grasses OR apply the postemergence grass herbicides 7 days after the Enlist One.

Upcoming Meetings

1. **Ag Breakfast / Auglaize County Farm Talk.** This Tuesday from 8:30 to 9:30 AM we will have a virtual Ag Breakfast meeting. The topic is Climate Change and It's Impact On Agriculture. The link to get onto the meeting is as follows: <https://osu.zoom.us/j/2119847503> If you just want to call in the phone number and meeting code are as follows: 646-876-9923 2119847503#
2. **The OSU Farm Office is Open.** The OSU Extension Farm Office Team will open our offices online and offer biweekly live office hours on Thursdays from **9:00-10:30 am EST**. In two weeks there will be a meeting!! Each office session is limited to 500 people and if you miss our office hours, we'll post recordings on farmoffice.osu.edu the following day. **Register at <https://go.osu.edu/farmofficelive>.**
3. **All OSU Extension face to face meetings have been cancelled or postponed through July 22th. Meetings after this date will go on as planned at least until further notice.**
4. The Farm Science Review has been cancelled for 2020 due to COVID-19, however it will proceed virtually, but the process has not been determined yet!

Answer to joke: They suspected it of fowl play!!

Be on the Lookout for Spider Mites



While scouting on Sunday, I found the first two-spotted spider mites in soybean. I only found two, two-spotted spider mites on one leaf on one plant in one field along a 30 foot grass strip! This is early, but individuals need to start scouting now to watch populations develop, especially those people in the driest parts of the county.

The scientific name for the two-spotted spider mite is *Tetranychus urticae*. They are not an insect, but closely related to spiders. The two-spotted spider mite has eight legs, two spots on its abdomen and red eyes. The two-spotted spider mite is very small and hard to see. The best way to see if you have the two-spotted spider mite is to take a black piece of paper and tap the plant to dislodge them. If you see small creatures crawling around on the paper, then it is most likely the two-spotted spider mite. The two-spotted spider mite lives on the underside of the soybean leaf.

The life cycle of a two-spotted spider mite is egg, larva, nymph, and adult. The adults over winter in crop and weedy areas such as grassy waterways, roadsides, set-aside acres, and/or pastures. As the temperatures rise in the spring, the two-spotted spider mite begins feeding on common hosts such as clovers, chickweed, and various grasses. The average generation interval during normal temperatures and humidity is 19 days, however under high temperatures and low humidity the generation interval can be reduced to five to seven days!! Eggs are only visible with a hand lens and are spherical, shiny, and straw-colored. Eggs hatch in three to 19 days.

The two-spotted spider mite usually just feeds on soybean, but can attack corn and red clover as well. Therefore, scout these crops as well.

Under normal precipitation and temperatures pathogenic fungi (primarily *Neozygites* sp.) and predators keep the two-spotted spider mite populations at non-economic levels. However, under hot and dry conditions, populations can build to economic levels in a short amount of time. The resurgence of moisture can reduce the population fairly quickly.

If you do not look for the spider mite itself, look for light-colored stippling damage on the lower leaves of the plants. If you do not observe it at this time, then light or sometimes yellow-colored leaves will occur in the mid and upper canopy of the plant. When populations get out of control the leaves turn a bronze color, webbing may be present on the underside of the leaves, and leaves will drop off the plant.

When the stippling extends into the middle canopy and is common in an area, treatment is recommended. The Ohio State University Extension does not recommend edge treatments for the two-spotted spider mite. Make decisions for the whole field.

Most pyrethroid insecticides with the exception of bifenthrin are not effective against two-spotted spider mites and may cause population explosions. Lorsban and generics have been popular choices historically against the two-spotted spider mite but may be less available now. For bifenthrin and Lorsban, check the field five days after application for resurgence because these products do not kill mite eggs.

There are specific miticide products that are particularly effective because they also kill mite eggs, eliminating the next generation. Two such products are abamectin (Agri-Mek SC), labeled for soybeans and etoxazole (Zeal), labeled for use on corn and soybeans.

In dry areas, get out and start looking for the two-spotted spider mite.

C.O.R.N. Newsletter

<https://agcrops.osu.edu/newsletter/corn-newsletter>

Western Bean Cutworm Numbers Starting to Increase



Western bean cutworm moth

We are in the third week of monitoring for Western bean cutworm (WBC) in Ohio. Numbers of WBC moths doubled from the previous week; however, overall numbers across the state remain low. Trap counts for the week of July 6 – 12 resulted in a total of 117 WBC adults (1.3 average moths per trap) (Figure 1). A total of 27 counties monitored 91 traps across Ohio. Sandusky County reported capturing more than 1 moth / day over the 7-day monitoring period; therefore, scouting for egg masses should begin in this county. Fulton County is approaching scouting threshold. All other counties monitored remain below threshold.

WBC Map Legend

-  No Data
-  >200
-  101-200
-  51-100
-  21-50
-  6-20
-  1-5
-  0



Figure 2. Western bean cutworm egg mass

Scout pre-tassel corn approaching tassel fields. Choose at least 20 consecutive plants in 5 random locations (scout different areas of the field that may be in different growth stages). Inspect the uppermost 3–4 leaves. Consider treatment if >8% of inspected plants have eggs or larvae (field corn) or in sweet corn, if >4% of inspected plants have eggs or larvae (processing market), or >1% of plants (fresh-market).

Treatment

If the number of egg masses/larvae observed exceed threshold, many insecticides are available to adequately control WBC, especially those containing a pyrethroid. However, as with any ear-burrowing caterpillar pest, timing is critical. Insecticide applications must occur after egg hatch, or after tassel emergence, but before caterpillars enter the ear. If eggs have hatched, applications should be made after 95% of the field has tassel. If eggs have not hatched, monitor for the color change. Hatch will occur within

24–48 hours once eggs turn purple. To search for larval injury after it has occurred, search the corn for ears having feeding holes on the outside of the husks.

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2020 Clean Sweep: Agricultural Pesticide Disposal



The Ohio Department of Agriculture will be sponsoring three collection events for farmers wishing to dispose of unwanted pesticides. This year, the collections are happening in Fayette, Hancock and Lake counties.

[August 18: Fayette County](#) 9 am - 3 pm

Fayette County Airport

2770 Old Rt 38 NE.

Washington Courthouse, Ohio 43160

[August 19: Hancock County](#) 9 am - 3 pm

Hancock County Fairgrounds

1017 E. Sandusky Street
Findlay, Ohio 45840

August 25: Lake County 9 am - 3 pm

Perry Coal and Feed

4204 Main Street

Perry, Ohio 44081

The pesticide collection and disposal services are free of charge, but only farm chemicals will be accepted. Paint, antifreeze, solvents, and household or non-farm pesticides will not be accepted.

In keeping with Governor Mike DeWine's State of Emergency due to the COVID-19 Pandemic, all ODA employees will be wearing face masks/coverings, following social distancing guidelines, and washing/sanitizing their hands and equipment often. It is highly recommended that anyone attending this event follow these guidelines as well. You can find the most up-to-date [safety guidelines here](#). The pesticide collections are sponsored by ODA in conjunction with the U.S. Environmental Protection Agency. To pre-register, or for more information, contact the Ohio Department of Agriculture at 614-728-6987.

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Corn Pollination



As temperatures remain hot for much of the state, corn continues to put on leaf collars and is approaching the start of flowering. Corn is a plant that has separate male (anthers on the tassel) and female (silks in the ear) flowers, and it is critical that the timing of flower emergence and activity overlap (sometimes referred to as the ‘nicking’ period) to ensure good pollination and kernel set. Another term used for flowering synchrony is the ‘anthesis-silking interval,’ which is the time from pollen shedding to silk emergence.

The start of pollen shed from the anthers on the tassel is called ‘anthesis’ and can occur before the plant reaches the VT growth stage. The VT growth stage is defined as “plants with all branches of the tassel fully visible, extended outward, and not held in by the upper leaves.” Many modern hybrids begin shedding pollen while the tassel is still emerging from the surrounding leaves.

Silk emergence signals the start of the R1 growth stage, which is defined as “one or more silks extending outside the husk leaves of the ear.” In many modern hybrids, we will actually see silks emerging prior to the tassel being fully emerged. This leads to a negative anthesis silking interval (silk emerges before pollen shedding), which is one way breeders have improved yields in modern hybrids. Shortening the time from anthesis to silking increases the likelihood of pollination and has helped increase yield over time. High temperatures and low moisture levels may lengthen the anthesis-silking interval compared to normal conditions, but both anthesis and silking last for approximately six days and occur throughout the day, so poor nick is not usually a common occurrence. Planting multiple hybrids in a field that vary slightly in their relative maturity or days to flowering can also help reduce the likelihood that the nicking period is missed.

Both high temperatures and moisture can also affect pollination success. It is recognized that temperatures above 90 degrees F can cause pollen to be non-viable, but much of the pollen shed in corn occurs in the morning hours before temperatures climb to these levels. Additionally, new pollen is made each day during this phase. The longevity of the pollen shed at lower temperatures can also be affected by the relative humidity. Pollen sheds from the plant with a moisture content of 50-65%, and can lose viability once the moisture content drops to 30%. In low relative humidity and high temperature conditions, this can happen more quickly. Moisture stress can slow the rate of silk elongation as this is driven by turgor pressure. Low relative humidity in combination with high temperatures can cause silks to desiccate and can reduce pollination success, but this may not be a major issue given the silks are close to the stalk and in the middle of the canopy where relative humidity tends to be greater than outside the canopy.

Sources

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Fonseca, A.E. and Westgate, M.E. 2005. Relationship between desiccation and viability of maize pollen. *Field Crops Res.* 94:114-125.

Pilar Herrero, M. and Johnson, R.R. 1980. High temperature stress and pollen viability of maize. *Crop Sci.* 20:796-800.

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Watch for Spider Mites in Dry Areas



Spider mite stippling damage in soybean. Image: bugwood.org

Hot, dry weather encourages certain pests in field crops, in particular spider mites in soybean and occasionally corn. Spider mites are a sporadic problem that most often occurs in August, but infestations in July are possible with sustained periods of hot, dry weather like some parts of Ohio are experiencing. Crop scouts in areas that have not received rain recently should be on the lookout for this problem; spider mites are easy to miss in early stages and can build quickly.

Look for light-colored stippling damage which is easier to spot than the mites themselves. In areas with heavy stippling you can confirm the presence of mites by tapping vegetation over a black piece of construction paper. [Many sources will say to use white paper; but insider tip: they are actually easier to see against a dark background]. The mites will look like specks of dust that move.

Stippling is common in the lower canopy even in non-outbreak situations. When the stippling extends up into the middle canopy and is common, treatment is recommended. We do not recommend edge treatments for this particular pest. Make the decision for the whole field. Most pyrethroid products with the exception of bifenthrin are not effective against spider mites and may even flare them. Lorsban and generics have been popular choices against mites but may be less available now. Check the field five days after application for resurgence because these products do not kill mite eggs.

There are specific miticide products that are particularly effective because they also kill mite eggs, eliminating the next generation. Two such products are abamectin (Agri-Mek SC), labeled for use on soybeans, and etoxazole (Zeal), labeled for use on corn and soybeans.

A resurgence of moisture will go a long way to reducing spider mite populations. Mites are particularly susceptible to fungal insect/mite killing pathogens which are favored by moist conditions (one of the reasons dry weather encourages mite outbreaks).

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Online Pesticide and Fertilizer Recertification Available for 2020 Expirations



Image: United Soybean Board

The Ohio Department of Agriculture (ODA), has partnered with the OSU Extension Pesticide Safety Education Program (PSEP) to offer online recertification for applicators whose licenses expire this year and have been unable to recertify as a result of the COVID-19 pandemic. Registration for the private pesticide and agricultural fertilizer programs are currently available at pested.osu.edu/onlinerecert. Online commercial pesticide recertification will be available from the same site beginning August 10.

The online recertification course allows participants to complete category-specific videos at their own pace, returning as often as desired to complete the required set of videos. These videos include category specific, up-to-date information provided by Ohio State University Educators and the ODA. Time spent in the program is tracked and participants must attest that they completed the recertification requirements.

The registration fees are payable online by credit card only: \$35 for private applicators, \$10 for fertilizer applicators, and \$15/credit hour for commercial applicators.

Ohio applicators have 90 days after Ohio's emergency declaration is over or December 1, whichever comes first, to complete their 2020 requirements. Recertification status can be checked online [here](#). Applicators must also complete an application and pay an additional fee to ODA to renew their license. ODA has not decided whether online recertification may be available beyond the current license year.

For additional information regarding online recertification or assistance with the online registration and payment process, please contact the OSU Pesticide Safety Education Program at 614-292-4070.

Private pesticide and fertilizer applicators who do not wish to recertify online for 2020 should contact their local county OSU Extension office to see if and when they may make an appointment to do the recertification at the office.

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Other Articles

Specialty Crops Available for CFAP Funding

July 14₂₀₂₀

by: Chris Zoller, Extension Educator, ANR Tuscarawas County

The United States Department of Agriculture (USDA) announced earlier this year the Coronavirus Food Assistance Program (CFAP). Developed earlier this year, CFAP is intended to assist farmers who suffered economic losses as a result of the COVID-19 pandemic. Initial payments were made available to growers of certain non-specialty and specialty crops, dairy, livestock, and wool producers. On July 9, 2020 USDA announced additional specialty crops eligible for economic assistance. The list of specialty crops includes:

- alfalfa sprouts, anise, arugula, basil, bean sprouts, beets, blackberries, Brussels sprouts, celeriac (celery root), chives, cilantro, coconuts, collard greens, dandelion greens, greens (others not listed separately), guava, kale greens, lettuce – including Boston, green leaf, Lolla Rossa, oak leaf green, oak leaf red and red leaf – marjoram, mint, mustard, okra, oregano, parsnips, passion fruit, peas (green), pineapple, pistachios, radicchio, rosemary, sage, savory, sorrel, fresh sugarcane, Swiss chard, thyme and turnip top greens.

The USDA also expanded CARES Act funding for sales losses for seven currently eligible commodities – apples, blueberries, garlic, potatoes, raspberries, tangerines and taro – because USDA found these commodities had a five percent or greater price decline between mid-January and mid-April as a result of the COVID-19 pandemic. Originally, these commodities were only eligible for marketing adjustments.

How to Apply for CFAP

Producers have several options available to apply for CFAP funding:

- The online portal, accessible at farmers.gov/cfap, allows producers with secure USDA login credentials—known as eAuthentication—to certify eligible commodities online, digitally sign applications and submit directly to the local USDA Service Center.
- Complete the application form using the Farm Service Agency CFAP Application Generator and Payment Calculator found at farmers.gov/cfap. This Excel workbook allows customers to input operation specific to populate the printable application form. The application form needs to be signed and submitted to a USDA Service Center.
- Download the AD-3114 application form from farmers.gov/cfap and manually complete the form to submit to a USDA Service Center by mail, electronically or by hand delivery to an office drop box. In some limited cases, the office may be open for in-person business by appointment.

Where to Apply for CFAP Funding

Eligible growers need to contact their local Farm Service Agency (FSA) office. Visit farmers.gov/coronavirus/service-center-status to check the status of your local FSA office. New customers seeking one-on-one support with the CFAP application process can call 877-508-8364 to speak directly with a USDA employee ready to offer general assistance. This is a recommended first step before a producer engages the team at the FSA county office at their local USDA Service Center. If you

have been enrolled in previous FSA programs, you may contact your local FSA office to discuss CFAP program eligibility and begin the enrollment process.

Additional Information

If you are interested in learning more about CFAP for specialty crops, please visit <https://www.farmers.gov/cfap/specialty>.

Tax Value of Farmland Expected to Drop

July 10₂₀₂₀

There's a bit of good news for Ohio farmers to counter the bad news caused by COVID-19, as well as by last year's historic rain. In counties scheduled for property value updates in 2020—about half of Ohio's 88 counties—the average value of farmland enrolled in the Current Agricultural Use Value (CAUV) program should be about 40% lower than 2017–2019, or about \$665 per acre.

That's according to projections by researchers at The Ohio State University [College of Food, Agricultural, and Environmental Sciences](#) (CFAES).

The same projections say that in counties due for property value updates in 2021—another quarter of Ohio's counties—average CAUV values should be about 25% less than 2018–2020, or about \$760 per acre.

The declines should mean lower property taxes, on average, for most of the farmers in those counties.

The projections were published in a May report by postdoctoral researcher [Robert Dinterman](#) and [Ani Katchova](#), associate professor and farm income enhancement chair, both of CFAES' [Department of Agricultural, Environmental, and Development Economics](#).

“Less money paid in property tax will help reduce farmers' costs and allow them to keep a greater share of the revenues they bring in,” Dinterman said.

But he noted that CAUV values are “not exactly equal to the property tax someone will pay.” A farm's total property tax bill, he said, also depends on how many taxing jurisdictions the land is subject to and the tax rate, or millage rate, within those jurisdictions.

There could “certainly be a few cases where an agricultural landowner sees a large reduction in their CAUV value but has a corresponding increase in their millage rate and ends up paying the same in property taxes,” Dinterman said.

Ohio counties update their property values, including their CAUV values, every three years on a rotating basis, with about a third of the counties seeing updates every year. The new values then apply for the next three years.

The state’s CAUV program allows farmland to be taxed based on its agricultural value instead of its full market value. Enrollment in the program, which is voluntary, “normally results in a substantially lower tax bill for working farmers,” an Ohio Department of Taxation website says.

A county’s CAUV values are based, roughly, on a formula using net farm income data from over the past five to seven years. More specifically, the data comes from a hypothetical farm producing soybeans, corn, and wheat during that period.

“In a nutshell, CAUV values are high when the previous five to seven years of farm income were high. CAUV values are low when the previous five to seven years of farm income were low,” Dinterman said.

Farmers had a boom in net income from about 2010-2014, which was partly a major cause of rising CAUV values in the past, he said.

“So now that we have been in a prolonged period of what people might consider low farm incomes, those values start to enter the CAUV formula and in turn lower their values,” Dinterman said.

“Clearly a farmer does not want to have low income, but a bit of good news that comes with that is that at least their tax bills will be a bit lower,” he said.

Dinterman and Katchova’s report also states that based on early projections, the quarter of Ohio counties scheduled for CAUV updates in 2022 will see only a small decrease in their values, about 1%, to \$880 per acre.

That ties in with the researchers’ expectation that the CAUV declines won’t continue.

“We should give a bit of a warning to farmers that the recent trend we’ve seen in reduced CAUV values has plateaued,” Dinterman said.

The reason: a major legislative change to the CAUV formula—related to how capitalization rates are calculated—was started in 2017. The change was phased in, and 2020 marks the end of the phase-in.

“That phase-in over 2017–2020 helped ease into the lowest CAUV values we’ve seen since about 2012,” Dinterman said. “We’re likely to stay within a range of about \$650–\$900 for average CAUV values in the foreseeable future.”

Read the report at go.osu.edu/may2020cauv.
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Space to grow, or grow in space -- how vertical farms could be ready to take-off

Date: July 14, 2020

Source: John Innes Centre

Source: <https://www.sciencedaily.com/releases/2020/07/200714082842.htm>

Vertical farms with their soil-free, computer-controlled environments may sound like sci-fi. But there is a growing environmental and economic case for them, according to new research laying out radical ways of putting food on our plates.

The interdisciplinary study combining biology and engineering sets down steps towards accelerating the growth of this branch of precision agriculture, including the use of aeroponics which uses nutrient-enriched aerosols in place of soil.

Carried out by the John Innes Centre, the University of Bristol and the aeroponic technology provider LettUs Grow, the study identifies future research areas needed to accelerate the sustainable growth of vertical farming using aeroponic systems.

Dr Antony Dodd, a group leader at the John Innes Centre and senior author of the study, says: "By bringing fundamental biological insights into the context of the physics of growing plants in an aerosol, we can help the vertical farming business become more productive more quickly, while producing healthier food with less environmental impact."

Jack Farmer, Chief Scientific Officer at LettUs Grow and one of the authors of the study, adds: "Climate change is only going to increase the demand for this technology. Projected changes in regional weather patterns and water availability are likely to impact agricultural productivity soon. Vertical farming offers the ability to grow high value nutritious crops in a climate resilient manner all year round, proving a reliable income stream for growers."

Vertical farming is a type of indoor agriculture where crops are cultivated in stacked systems with water, lighting and nutrient sources carefully controlled.

It is part of a rapidly growing sector supported by artificial intelligence in which machines are taught to manage day to day horticultural tasks. The industry is set to grow annually by 21% by 2025 according to one commercial forecast (Grand View Research, 2019).

Green benefits include better use of space because vertical farms can be sited in urban locations, fewer food miles, isolation from pathogens, reduction in soil degradation and nutrient and water recapturing and recycling.

Vertical farms also allow product consistency, price stabilization, and cultivation at latitudes incompatible with certain crops such as the desert or arctic.

"Vertical systems allow us to extend the latitude range on which crops can be grown on the planet, from the deserts of Dubai to the 4-hour winter days of Iceland. In fact, if you were growing crops on Mars you would need to use this kind of technology because there is no soil," says Dr Dodd.

The study, which appears in the journal *New Phytologist*, lays out seven steps -- strategic areas of future research needed to underpin increased productivity and sustainability of aeroponic vertical farms.

These seek to understand:

Why aeroponic cultivation can be more productive than hydroponic or soil cultivation.

The relationship between aeroponic cultivation and 24-hour circadian rhythms of plants.

Root development of a range of crops in aeroponic conditions.

The relationship between aerosol droplet size and deposition and plant performance.

How we can establish frameworks for comparing vertical farming technologies for a range of crops.

How aeroponic methods affect microbial interactions with plant roots.

The nature of recycling of root exudates (fluids secreted by the roots of plants) within the nutrient solutions of closed aeroponic systems.

The report argues that a driver of technological innovation in vertical farms is minimizing operation costs whilst maximizing productivity -- and that investment in fundamental biological research has a significant role.

Dr Dodd's research area covers circadian rhythms -- biological clocks which align plant physiology and molecular processes to the day to day cycle of light and dark. He recently completed a year-long Royal Society Industry Fellowship with LettUs Grow.

This involved combining Dr Dodd's expertise in circadian rhythms and plant physiology with the work of LettUs Grow's team of biologists and engineers to design optimal aeroponic cultivation regimens. This is a key area of investigation as these molecular internal timers will perform differently in vertical farms.

Aeroponic platforms are often used to grow high value crops such as salads, pak choi, herbs, small brassica crops, pea shoots and bean shoots. LettUs Grow are also working on growth regimens for fruiting and rooting crops such as strawberries and carrots, as well as aeroponic propagation of trees for both fruit and forestry.

John Innes Centre researchers have bred a line of broccoli adapted to grow indoors for a major supermarket and one of the aims of research will be to test how we can genetically tune more crops to grow in the controlled space of vertical farms.

Bethany Eldridge, a researcher at the University of Bristol studying root-environment interactions and first author of the study adds: "Given that 80% of agricultural land worldwide is reported to have moderate or severe erosion, the ability to grow crops in a soilless system with minimal fertilizers and pesticides is advantageous because it provides an opportunity to grow crops in areas facing soil erosion or other environmental issues such as algal blooms in local water bodies that may have been driven by traditional, soil-based, agriculture."

Lilly Manzoni, Head of Research and Development at LettUs Grow and one the authors of the study says, "This paper is unique because it is broader than a typical plant research paper, it combines the expertise of engineers, aerosol scientists, plant biologists and horticulturalists. The wonderful thing about controlled environment agriculture and aeroponics is that it is truly interdisciplinary."

The study *Getting to the Roots of Aeroponic Indoor Farming* appears in the *New Phytologist* journal.

John Innes Centre. "Space to grow, or grow in space -- how vertical farms could be ready to take-off." ScienceDaily. ScienceDaily, 14 July 2020. <www.sciencedaily.com/releases/2020/07/200714082842.htm>.

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