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# Greenhouse cucumber research could help KY growers diversify

By Carol Lea Spence, UK Agricultural Communications Services

Rotating greenhouse crops or making use of greenhouses while crops are growing in the field can give farmers more options and more income. The University of Kentucky Controlled Environment Horticulture Research Unit, the Owen Lab, is in the midst of a two-year study to evaluate cucumber varieties for greenhouse production.



Photo by Garrett Owen

“When you look at all the research that’s been conducted in the U.S., hydroponic cucumbers have gained little attention, though there are some researchers looking at cucumbers for high tunnel production,” said Garrett Owen, UK assistant professor in the [Department of Horticulture](#) and unit director. “Greenhouse food crop research has been more focused on tomato production, leafy greens and herbs. Our mission is to generate Kentucky-specific data for growers who are interested in growing cucumbers or want to diversify their crops.”

[College of Agriculture, Food and Environment](#) doctoral student Paul Cockson is conducting this research on English and snack or mini cucumbers for his dissertation. He is screening cucumber varieties and cultivars for production in Kentucky’s temperate zone —

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## Coming up

**Aug. 2, 4, 6, 9, 11 and 13** - Purdue Small Farm Webinar Series. Noon to 1:30 p.m. EDT. For more information, [click here](#). To register, go to <https://www.purdue.edu/hla/sites/studentfarm/events/>.

**August 5** - From Plans to Realities on a Successful Organic Market Farm: Virtual Field Day. Sustainable Harvest Farm, London, KY. Offered via Zoom. Free, but registration is required. Organic Association of Kentucky field day. For details and to register, go to <https://www.oak-ky.org/farmer-field-days-2021>.

**August 25** - PSA-FSMA Grower Training Course - Remote. Deadline to register is August 1. Free for KY growers, \$100 for non-KY residents. For details, [click here](#).

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A greenhouse on UK's Horticulture Research Farm plays host to a two-year study on cucumber varieties for greenhouse production.

Photo by Garrett Owen



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assessing yield data, growth metrics and grading the fruit according to Canadian/U.S. grade standards.

Cucumber production cycles are three to four months, so greenhouse growers can get from three to four turns per year. The cucumbers in Cockson's spring study took about 14 weeks from seed sow to final harvest.

"We're looking at season extension, so we're going to be doing a spring and a fall crop, looking at truncated production when producers are out in the field (with other crops), to see if they could use some of their existing infrastructure for a quick-turn crop like cucumbers," he said.

Owen said they chose cucumbers, because many Kentucky greenhouse growers have predominantly grown tomatoes. Cucumbers can adapt to the current systems they already have installed in greenhouses.

Greenhouse vegetable producers must manage the environment and cultural practices to prevent and mitigate any disease or infestations.

"Our No. 1 disease that we've experienced so far is powdery mildew, but with good cultural practices and management of the environment, we've only had to treat or spray for powdery mildew in a few instances," Owen said.

By starting clean and staying clean, the researchers have avoided disease and pest issues, but if they

do encounter problems, they will use conventional control methods as well as consider biological options for disease and pest control.

The team have seen some interesting trends for fruit quality among the different types they're assessing.

"We're seeing some of the fruit elongate or lengthen or expand differently, and that's something odd," Cockson said. "Normally you're going to assume that on the vine, the cucumber is going to lengthen and fill out at a consistent rate to produce a very consistent product. What we're seeing is that some of these cultivars are producing lesser-grade fruits, and so we'll be comparing instances of fruit morphological changes."

They've also seen differences in the time it takes a vine to grow.

"Some are growing slower, so that will help inform growers. If a grower is looking for an aggressively growing cultivar, and they want to get in and out quickly, we can recommend one type versus another," Cockson said.

Under the conditions in the UK greenhouse, he said the study cucumbers are performing extremely well.

"In my opinion, this is the perfect fit for Kentuckians, someone with that truncated production or season extension, because these cultivars are performing so well and growing so rapidly and producing so much," he said.



## Scott joins UK Horticulture team as new Floriculture/Greenhouse Extension Associate

Delia Scott is the new Extension Associate for Floriculture, Greenhouse and Controlled Environments in the UK Department of Horticulture. A Kentucky native, she most recently worked in the Department of Entomology at UK, studying alternative pest control strategies. Her background includes sustainable and organic horticultural production, community programming, educational program development, and local food systems. Delia will design, develop and deliver extension programs, as well as consult with growers on floral and greenhouse vegetable crop production, perform research and demonstrations, and address greenhouse-related issues. Delia holds a B.S. in Horticulture and an M.S. in Crop Science, both from UK. She can be reached at [delia.scott@uky.edu](mailto:delia.scott@uky.edu) or by phone at 859-257-8605. This position is funded by the Kentucky Horticulture Council through a grant from the Kentucky Agricultural Development Fund.



Delia Scott

## CCD resources update

*Tennessee cut flowers crop profile, biofumigation fact sheet among new publications available online*

A new crop profile developed by the UK Center for Crop Diversification, Cut Flower Production in Tennessee (CCD-CPA-CP-3), is now available on the University of Tennessee's Center for Profitable Agriculture website at [https://cpa.tennessee.edu/wp-content/uploads/sites/106/2021/07/TNcutflowers\\_Final.pdf](https://cpa.tennessee.edu/wp-content/uploads/sites/106/2021/07/TNcutflowers_Final.pdf). A new fact sheet, The Basics of Biofumigation (CCD-FS-20), from the UK Department of Horticulture's Rachel Rudolph and former UK plant pathologist Emily Pfeufer, is now available at <https://www.uky.edu/ccd/sites/www.uky.edu/ccd/files/biofumigation.pdf>. Additional new resources on cut flowers, including videos from the UK Cooperative Extension Virtual Cut Flower Short Course, are available on the CCD website at <https://www.uky.edu/ccd/production/crop-resources/nursery-ornamental/cut-flowers>.

The CCD's crop profile on Organic Sweet Corn (CCD-CP-110) has been updated and is [available here](https://www.uky.edu/ccd/). For these and other resources, please visit the CCD website at [www.uky.edu/ccd/](https://www.uky.edu/ccd/).



# Tools available to help growers analyze flood risk

By Joshua Knight, Sr. Extension Associate, Horticulture

Recent news from around the world has shown historic flooding events. Exceptional rainfall events have devastated communities across Western Europe in Germany, Holland and Belgium with entire towns flooded out, hundreds killed, and critical infrastructure swept away. In Central China, “once in a thousand year” heavy rains came and were described as “sparking the worst flash flood in centuries.” As many communities across the Commonwealth already know, we don’t have to go far abroad to find our own stories of severe flooding this year.

While the western part of the United States has spent this summer battling extreme droughts and heat waves, much of the country appears to be receiving that missing rain. Unfortunately, it doesn’t always show up as a gentle, all day misting to provide the crops with exactly what they need to thrive. Often, it is coming on top of storms and pushing patterns into extreme precipitation events (Figure 1). These events are projected to increase in a warming climate, leading to more severe floods and greater risk of infrastructure failure.

In 2018, 13 federal agencies collaborated to produce the **National Climate Assessment**. This several hundred-page document details risks associated with a warming climate and recommendations. A “Key Message” related to water in the assessment reads as follows:

*Infrastructure design, operation, financing principles, and regulatory standards typically do not account for a changing climate. Current risk management does not typically consider the impact of compound extremes (co-occurrence of multiple events) and the risk of cascading infrastructure failure.*

An example of this occurred in Michigan last year, where a “500-year flood” from 7 inches of rain in a short period overtook the Edenville Dam, causing a chain reaction that led to the failure of the Sanford Dam, where lakes were left dry as homes were underwater.

In addition to infrastructure failure, excessive runoff, leaching and flooding drives significant soil erosion and the degradation of water quality in the lakes and streams grower communities rely

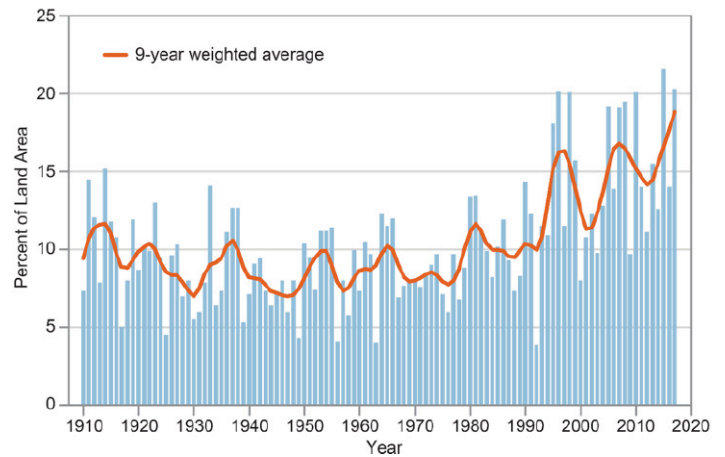


Figure 1. The figure shows the percent of land area in the contiguous 48 states experiencing extreme one-day precipitation events between 1910 and 2017. These extreme events pose erosion and water quality risks that have increased in recent decades. The bars represent individual years, and the orange line is a nine-year weighted average. Source: adapted from EPA 2016.171

on for irrigation and drinking water. The Climate Assessment also gives examples of practices land managers can use to improve the flood resilience of their managed landscapes (Figure 2).

## What Is Your Risk?

There are several tools for looking up and evaluating flood risk on your property or in your area. The **Federal Emergency Management Agency (FEMA) maintains the Flood Map Service Center (MSC)** at <https://msc.fema.gov/portal/home>. It should be noted that many parts of the national

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Figure 2. Increasing heavy rains are leading to more soil erosion and nutrient loss on Midwestern cropland. Integrating strips of native prairie vegetation into row crops has been shown to reduce soil and nutrient loss while improving biodiversity. The inset shows a close-up example of a prairie vegetation strip. From Figure 21.2, Ch. 21: Midwest (Photo credits: [main photo] Lynn Betts; [inset] Farnaz Kordbacheh)



# Drier than average start to August, but wetter overall

By Joshua Knight, Senior Extension Associate, Horticulture

The NOAA's Climate Prediction Center is forecasting an elevated chance of drier than average conditions for Kentucky, as well as the region surrounding the Great Lakes, for the first week of August. This is also expected to come alongside cooler than average temperatures for the Commonwealth and the Northeastern states.

The picture shifts in the second week and overall for the month of August, with an above average chance of precipitation for Kentucky and surrounding states. The three-month forecast for August, September and October has an increased chance for above average precipitation rates for Kentucky and the Eastern states in general, while drier than average conditions are expected to hold for the South-western states, exacerbating the exceptional drought conditions there. Temperature-wise, aside from the cooler than average first week, the rest of the August forecast shows an equal chance of cooler or warmer than average temperatures.

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map have not been updated or re-evaluated in several years. However, this data shows places with recognized "floodways" and other areas noted by federal regulation.

Another option is the **First Street Foundation's National Flood Risk Assessment** (the first of its kind) developed in 2020. Located at <https://flood-factor.com>, this tool provides summary information, historic flooding information, and an interactive "Flood Risk Explorer" where one can look up specific locations (Figure 3), adjust how "extreme" events would need to be based on likelihood, and see depth information (Figure 4).

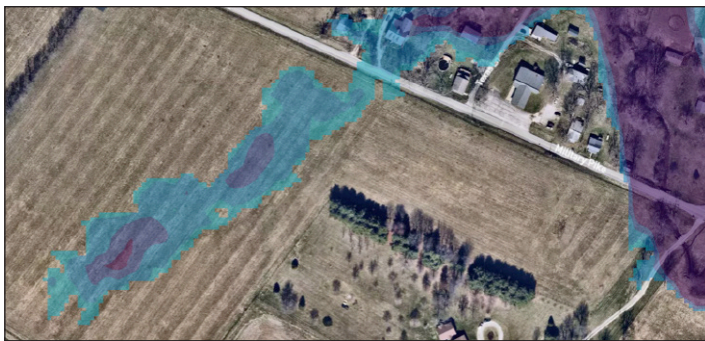


Figure 3. National Flood Risk Assessment Map - Flood Risk Explorer, areas impacted overlaid in blue. Darker colors mean deeper water.

In most cases, growers and land managers already know intimately where their flood prone areas are, but these tools can be a valuable way to double-check one's understanding of the land, neighbors' land, and if any critical infrastructure is threatened like highways and county roads, which may be cut off during an extreme event.

See the list below for links to previously mentioned

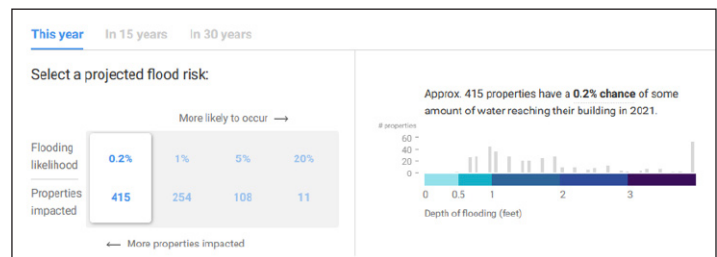


Figure 4. National Flood Risk Assessment Map - Key and Controls for Flood Risk Explorer. TOP, adjust based on climate change predictions, LEFT, make adjustments for extreme event (0.2% = 500-year flood), RIGHT, shows depth of event.

tools and other relevant resources.

## Resources

- National Climate Assessment - [https://nca2018.globalchange.gov/downloads/NCA4\\_2018\\_Full-Report.pdf](https://nca2018.globalchange.gov/downloads/NCA4_2018_Full-Report.pdf),
- FEMA Flood Map Service Center (MSC) - <https://msc.fema.gov/portal/home>
- First Street Foundation - Flood Model Map - <https://www.floodfactor.com/>

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