

Kentucky Fruit Facts

March 2021

<http://www.uky.edu/hort/documents-list-fruit-facts>

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Note: We have ceased publishing Fruit Facts as a hard copy or mailed newsletter. If you would like to continue receiving Fruit Facts, please sign up for email delivery as described at the end of this newsletter or contact your County Extension Office to have them print a copy for you.

Fruit Crop News

Daniel Becker, U.K. Extension Associate

February, a very difficult month weather-wise is finally behind us. Ice deposited from freezing rain on the 9th made travel in outlying areas treacherous throughout western Kentucky. In Princeton where I am based, temperatures were below freezing for 10 days straight with 0.7°F as the low overnight on the 16th. Snow depth in un-drifted areas amounted to six inches when measured at the UK Research and Education Center (UKREC) on the 19th.

More recently, much of the state experienced heavy rainfall with some areas receiving more than two inches. The Caldwell county Mesonet weather

station where the UKREC is located recorded that 1.75 inches of rain fell on the 28th which lead to localized flooding in low lying areas. In the eastern part of the state heavy rainfall caused widespread flooding. Many of the fields and some buildings at the Robinson Center for Appalachian Resource Sustainability along the North Fork Kentucky River were inundated.

With the prospect of warmer and hopefully drier weather ahead let's look towards a more promising future, one of progress and good working conditions. Anyone who hasn't had a chance to get outside much, I'm sure is itching to do so as warmer weather and hopefully drier soil conditions become the norm.

Pruning of apples, blueberries, and other hardy fruits should be proceeding rapidly. Continue to delay pruning of less hardy young apple trees, peaches, and blackberries. If at all possible, try to wait until just before budbreak or even during bloom if you have a small number of plants.

Keep an eye out for fireblight and bacterial cankers on apples and peaches, and black knot on plums. Prune these out well past the infection, preferably six inches or more. It is a good idea to disinfect your pruners afterward to reduce the chance of spread. A 10% bleach-water mixture is an option, though, it may cause pitting of some metals. If unsure, apply to only a small area of the blade and observe if there is a reaction. Publications of these and other diseases are available on the UK Plant Pathology Extension Publications webpage, <http://plantpathology.ca.uky.edu/extension/publications>.

The minimum low temperatures in February (Figure 1) certainly felt chilly, but I do not think it was cold enough to cause injury to fruit crops in good condition. Stressed or weak plants are less hardy and

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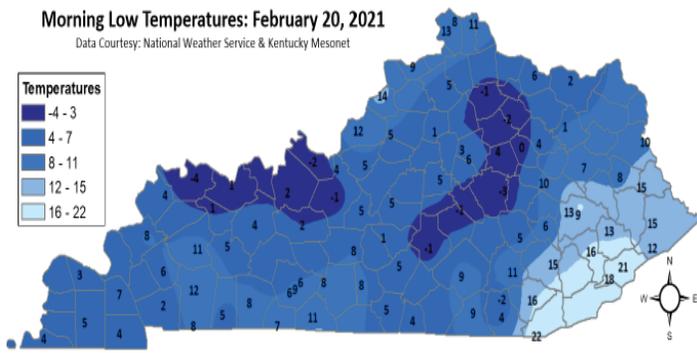
LEXINGTON, KY 40546



Disabilities
accommodated
with prior notification.

might have experienced some bud damage. Western counties along the Ohio River and some central counties where it dropped below 0°F on February 20 could be an exception. Some damage to thornless blackberries and less hardy European or French hybrid grapes is possible in this area. I expect that deep snow cover protected the crowns and graft unions.

Figure 1. Lowest temperatures (°F) experienced across the state



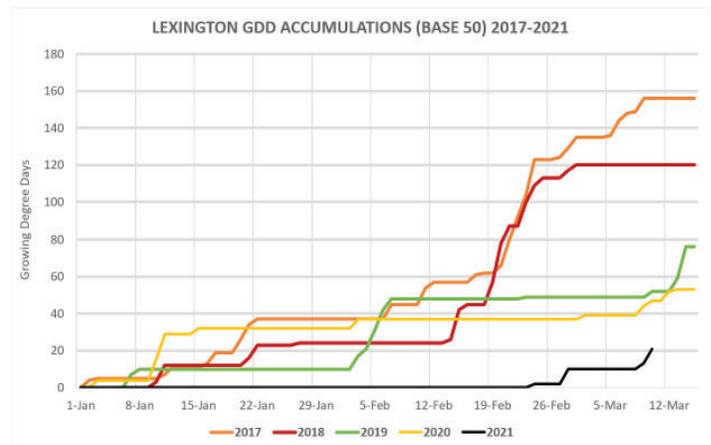
A general rule is that thornless blackberries will lose 10% of their crop potential for each degree below zero. Canes typically do not survive below -10°F. However, it is not a hard and fast rule as a good crop was produced in 2015 at the UKREC despite temperatures falling to -13°F. Injured portions of canes can have live buds that will leaf out in the spring, but then the foliage will collapse and dry up in hot weather. The damaged tissues are unable to transport enough water to support new growth. Where injury is noticeable prune canes back to live tissue. If injury does not extend too far down, canes may still produce a small crop.

I performed a bud injury assessment on shoots gathered from five ‘Redhaven’ peaches on Lovell rootstock. Two thin short shoots (under 12”) and two larger, longer shoots (over 24”) were collected from each tree on March 4. Shoots were placed in a bucket with water covering the cut ends and stored at room temperature for 24 hours. After the hold period, the shoots had all of their flower buds removed and each bud was cut through laterally to observe the interior. Any browning or discoloration observed indicated that injury had occurred, and that the bud was dead. Of 552 total buds evaluated, 444 were alive and 108 were dead, an 80% survival rate ([444 alive / 552 total] x 100), still well more than enough for a potential full crop. Peaches only need about 6-10% of their buds in order to set a full crop, the rest are normally removed during pruning and fruit thinning.

As of March 12, blueberries were in bud swell and sweet cherries were in swollen bud. Both peaches and apples had not yet entered the swollen bud or the silver tip stages, but I expect this to change rapidly if it stays warm. Average weekly air temperatures have just begun to exceed 50°F and soil temperatures in the top 2 inches of soil are above 40°F. Winter covers should already be off plasticulture strawberries to avoid pushing growth too early. Strawberry flower buds emerge soon after new leaves. If growth begins too early, it sets plants up for either spring frost losses or growers expending extra effort managing covers for protection. Now is also a good time to think about removing straw from matted row plantings. Delaying raking straw into the aisle between beds can lead to increased crown rot and reduced yield potential.

Figure 2 shows the accumulation of growing degree days (GGD base 50°F) for 2021 in comparison with several previous seasons. So far this year, 48 GGD’s have been accumulated in Princeton, 29 in Lexington, and 43 in Jackson at the eastern end of the state. This should mean that we are just slightly ahead of the more normal seasons of 2014 and 2015 and behind where we were in 2019 and 2020. Good news as far as I am concerned.

Figure 2. Growing degree day accumulations (base 50°F) for 2021 and past years.



Looking ahead, the NOAA Climate Prediction Center is predicting a 40% probability that warmer and wetter than average conditions will occur over the next month (Figures 3 and 4). Over the next three months, this warm pattern is expected to continue. Models are less confident about rainfall during the three-month period, with only a 30% probability of above normal precipitation predicted, and only for the western and central portions of the state.

Mar. 16, 18 and 20, MarketReady Producer Core Trainings. The MarketReady Training has changed from a full-day, in-person training to a virtual, 90-minute training. The Core Producer training is offered at no cost for producers interested in selling to restaurants, schools, and grocers/wholesalers/retailers. See the full training description and scheduled times for each day at <https://www.uky.edu/marketready/>. The information presented is the same for each meeting, be sure to register for only one time slot as space is limited to 30 people. Register at <https://www.uky.edu/marketready/upcoming-events>.

Mar. 18, Virtual Fruit Grower Orchard Meeting. The session will start at 10:00 AM and end at 12:00 PM. See the program schedule and details on how to attend immediately following the upcoming meetings section.

Mar. 23, Fruit pruning demonstration. Laurel Co. Schedule TBD. Contact Bonnie Sigmon, Laurel County Horticulture agent for details. (606) 864-4167, bonnie.sigmon@uky.edu.

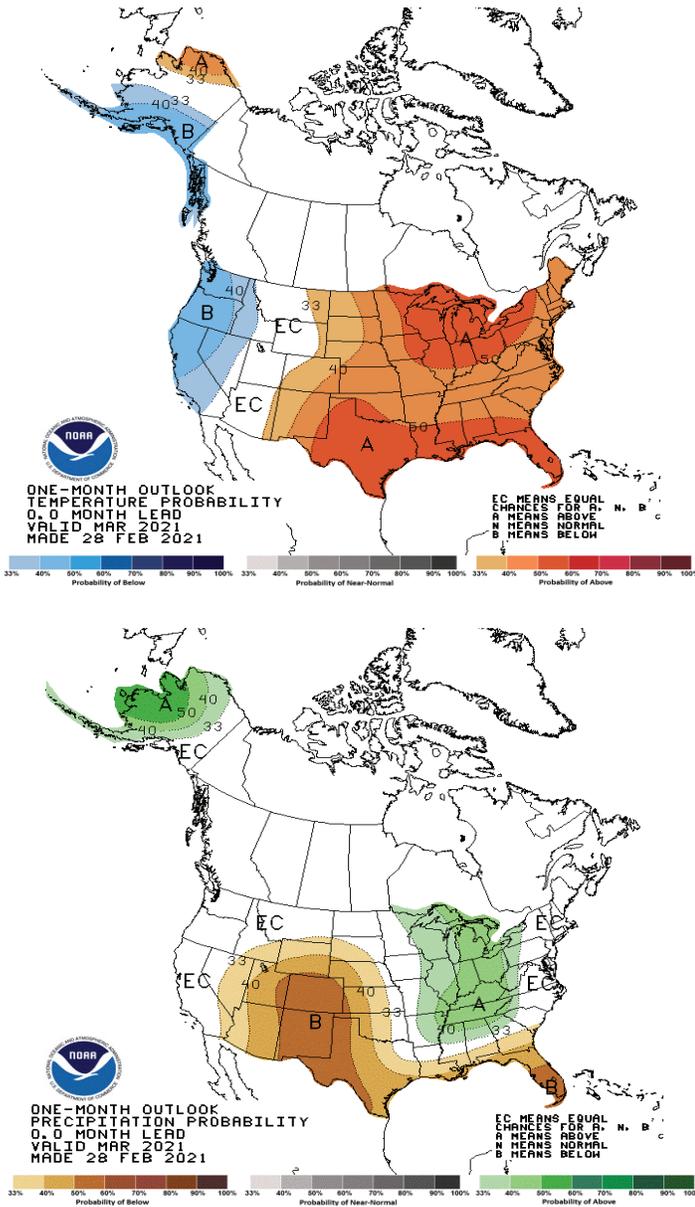
Mar. 23, 30, and Apr. 6, OSU Fruit Production Online Series. 9:30 AM – 11:30 AM each day. This series hosted by The Ohio State University South Centers will cover blueberries on March 23, blackberries on March 30, and raspberries on April 6. Register no later than the Monday prior to each event at <http://go.osu.edu/fruitseries>.

Mar. 25, Apr. 1, 8, 15, and 27, MarketReady Advanced Topic Webinars. These 90-minute trainings are for MarketReady participants who want to take a deeper dive into some of the business functions covered in our core training. Different information is presented at each training. Like the core training, slots are limited to 30 participants. See the training descriptions, scheduled times, and register at <https://www.uky.edu/marketready/upcoming-events>.

Mar. 30, Home Blackberry Production. 6:00 p.m. CST. Lyon County Extension Office, 231 Main St., Eddyville, KY 42038. Contact: 270-388-2341.

Mar. 31, Common Blueberry Planting Problems. This is part of the Horticulture Webinar Wednesday's series with presentations on topics each Wednesday from Feb. to May. A registration link and links to past presentations from seasons one and two are available at <https://kentuckyhortnews.com/horticulture-webinar-wednesdays/>.

May 4, Fruit Grower Orchard Meeting. Schedule TBD. Evans Orchard and Cider Mill, Kevan



Figures 3 and 4. NOAA Climate Prediction Center one-month temperature and precipitation probability outlook.

Upcoming Meetings

All times EDT unless noted.

Mar. 9, 16, and 23, Purdue Extension Fruit Management Webinar Series. 1:00 PM – 3:05 PM each day. A full schedule for each day and the online registration form is available at: <https://www.indianahortconference.org/registration/>. Sessions are recorded and a link will be sent out once they are posted. Registrants have the option to watch any missed sessions.

Evans, 198 Stone Rd., Georgetown, KY 40324,
Phone: 502-863-2255.

Jan. 2-4, 2022 Kentucky Fruit and Vegetable Conference. Schedule TBD. Sloan Convention Center, 1021 Wilkinson Trace, Bowling Green, KY 42103. Contact Kentucky Horticulture Council at 859-490-0889; Email: info@kyhortcouncil.org.

Virtual Fruit Grower Orchard Meeting Thursday, March 18

We are still concerned about COVID, so we have decided to make our firstorchardmeetingvirtual. Hopefully many growers will have received the vaccine by the time of our second meeting, and we can get together.

Directions:

Nicole Gauthier is inviting you to a scheduled Zoom meeting.

Join from PC, Mac, Linux, or mobile device: <https://uky.zoom.us/j/83940481276>

Or iPhone one-tap (US Toll):
16468769923,83940481276# or
13017158592,83940481276#

Or Telephone:

Dial:

+1 646 876 9923 (US Toll)

+1 301 715 8592 (US Toll)

+1 312 626 6799 (US Toll)

+1 669 900 6833 (US Toll)

+1 253 215 8782 (US Toll)

+1 346 248 7799 (US Toll)

Meeting ID: 839 4048 1276

International numbers available: <https://uky.zoom.us/j/83940481276>

Or Skype for Business (Lync):

[SIP:83940481276@lync.zoom.us](https://lync.zoom.us/j/83940481276)

Program:

All times EST

9:45 a.m.	Zoom link will be active
10:00	Fire Blight!!! - Nicole Gauthier
10:30	Mating Disruption of CM and OFM - Ric Bessin
11:00	Preparation for Fruit Thinning - John Strang

11:30	Grower Round Table Discussion - Jonathan Price, moderator
Noon	Conclude



Fruit Production with Help from Historical Climate Data

Matt Dixon, U.K. Ag Meteorologist

As is the case with all other agriculture sectors, fruit management and production is heavily dependent on weather conditions throughout the year. The weather will obviously dictate the need for frost protection, spray applications, irrigation, and much more. Over the past decade, there has been a shift in our climate across the Lower Ohio Valley. Kentucky has seen a trend toward warmer and wetter conditions on an annual and seasonal basis. We have seen the impacts of these changes in a number of ways as it pertains to fruit. One that comes immediately to mind is warmer late winter/early spring temperatures leading to more advanced floral developmental stages earlier in the spring. As was the case last year, this led to damage to portions of the fruit crop in April and May with a couple late season freezes (more about this later).

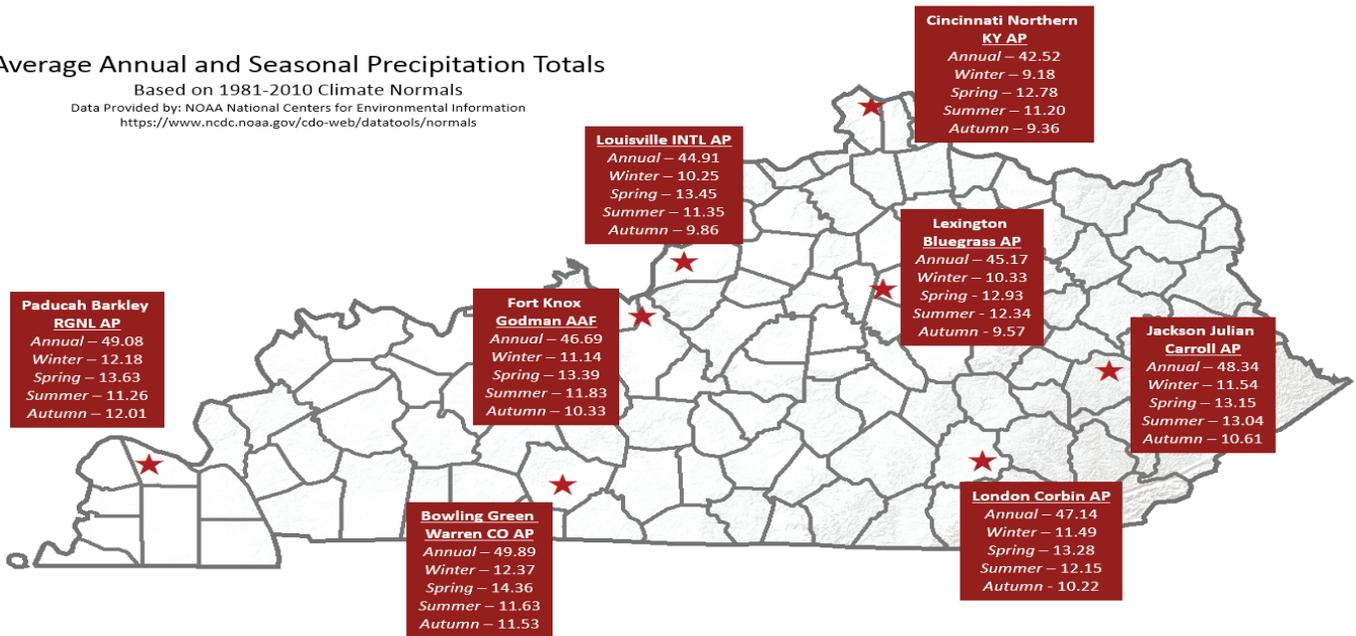
In the end, the weather and climate here in the Lower Ohio valley plays a large factor into the success or failure of an agricultural operation. This article will focus on changing climate trends (precipitation and temperature) with the hope of prompting some thoughts on future fruit production years and management practices moving forward.

Normals

In starting out, I'll be referencing the word "normal" quite a bit through the article. What is a "normal"? It is essentially the 30-year average of a particular weather variable. Just as an example, the map below shows normal annual and seasonal precipitation across the state. These "normals" tell us that Northern Kentucky averages about 42.5 inches per year, while Southern KY is closer to 50 inches. Essentially, these normals gives us a comparison to current weather conditions. In another example, the high temperature in Lexington on March 10th, 2021 was 70 degrees. Our normal maximum temperature for March 10th is roughly 53 degrees, meaning we were 17 degrees above "normal".

Average Annual and Seasonal Precipitation Totals

Based on 1981-2010 Climate Normals
 Data Provided by: NOAA National Centers for Environmental Information
<https://www.ncdc.noaa.gov/cdo-web/datatools/normal>



As you see on the map, these normals are based on the years 1981 through 2010. Normals are updated every 10 years to account for any changes in the climate over the past decade. Our next set of normals will be based on the years of 1991 through 2020 and are set to be released in May of this year. The current normals for a location near you can be accessed through the National Centers for Environmental Information at: <https://www.ncdc.noaa.gov/cdo-web/datatools/normal>.

Kentucky has averaged 8.45 inches, which is 1.25 inches above normal.

Kentucky Top Ten Wettest Years on Record (1895 - 2020)

Rank	Year	Total	Normal	Dep.
1	2011	64.35	47.9	16.45
2	2018	63.74	47.9	15.84
3	1950	62.63	47.9	14.73
4	1979	62.58	47.9	14.68
5	2019	61.32	47.9	13.42
6	1935	58.38	47.9	10.48
7	2015	58.31	47.9	10.41
8	2020	57.87	47.9	9.97
9	1989	57.74	47.9	9.84
10	1972	56.08	47.9	9.18

Table 1 - Data Courtesy: Midwestern Regional Climate Center, cli-MATE tools environment, <https://mrcc.illinois.edu/CLIMATE/>

Precipitation

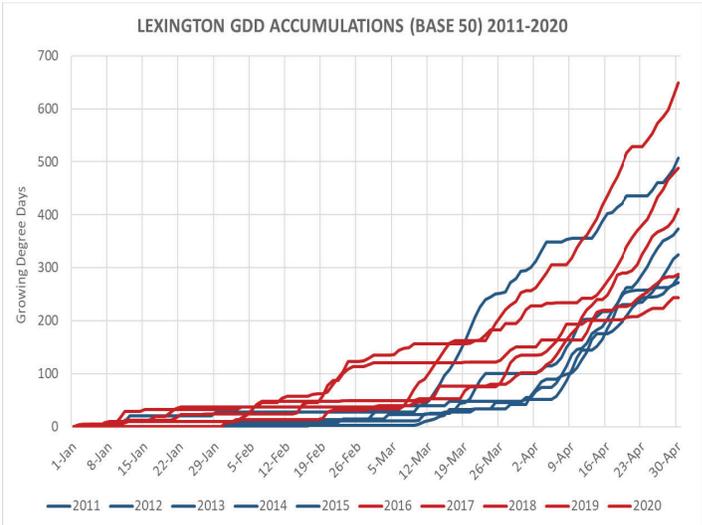
Kentucky has seen some very wet years recently. Based on the 1981 to 2010 climate normals, the state averages 47.90 inches per year. Kentucky has exceeded that normal each of the past six years. In 2020, alone, the state averaged 58.07 inches. This is good for the 8th wettest year on record for the Bluegrass State. Years placing in the ‘top-10’ has been no stranger to Kentucky as of late. In the chart below, the 10 wettest years in Kentucky history are listed with data going back to 1895. As you can see, this chart now contains 5 years in the past decade. The past three years are all included in 2018, 19, and 20. Data has to be traced back to 2014 to find the last time that Kentucky saw below normal annual precipitation. Bottom line, Kentucky has been shifting to a wetter climate over the past several years. This same trend has held true over the first couple months of 2021 as

Temperature

Not only has Kentucky seen some very wet years recently, our climate has also been trending warmer. In fact, the state temperature average has also run above normal each of the past six years. In the chart, I included the top 10 warmest years in Kentucky history with data once again going back to 1895. Four of our top-10 warmest winters have

occurred in the past decade. 2020 ranked #17 on record with a state average of 57.1 degrees.

The warmer conditions have been seen on not only the annual scale, but also at the seasonal scale. As stated above, this had led to fruit hitting more advanced developmental stages earlier in the year. One way to track development is through the use of growing degree days. If not familiar with GDDs, they are used to relate temperature to crop development. In calculating growing degrees days, you simply calculate the average temperature for the day and subtract a base temperature, which is the minimum temperature required for growth. This number will vary by crop, but in past editions of Fruit Facts, a base of 50 has been used. In the table below, Growing Degree Days (GDDs) were accumulated between January 1st and April 30th over the years of 2011- 2020. Instead of showing the years in separate colors, I simply color-coded the first 5 years of the decade in blue and the latter half in red. Ensuing growth and development is expected anytime the line increases and no growth when the line levels off. Something that sticks out on the graph is the higher GDD accumulations over the past 5 years (red) compared to the first 5 (blue). This is especially true when looking at GDD accumulations around the start of spring (March 20). Accumulations are running closer to the blue lines in 2021, mainly due to a cooler February that we have not seen in quite a few years. Prior to 2021, the state temperature average for each of the past five February's ran above normal.



Kentucky Top Ten Warmest Years on Record (1895 - 2020)

Rank	Year	Avg.	Normal	Dep.
1	1921	58.7	55.9	2.8
2	2012	58.4	55.9	2.5
3	1998	58.2	55.9	2.3
4	2016	57.9	55.9	2.0
5	2017	57.8	55.9	1.9
5	1931	57.8	55.9	1.9
7	2007	57.7	55.9	1.8
8	1938	57.5	55.9	1.6
8	2019	57.5	55.9	1.6
10	1933	57.4	55.9	1.5
10	1991	57.4	55.9	1.5

Table 2 - Data Courtesy: Midwestern Regional Climate Center cli-MATE tools environment, <https://mrcc.illinois.edu/CLIMATE/>

Frost/Freeze Occurrence

As stated above, warmer winters and advanced growth earlier in the spring presents some concern in regard to late spring freezes. Problems were seen in 2020 with a freeze in the middle of April and another in early May. There may be some questions as to whether later freezes (post-April) are in play moving forward. While they will be possible, frost/freeze occurrence data is actually trending in the opposite direction. In the chart below, I included the average last freeze date for various locations across the state according to three sets of normals: the 1971-2000 climate normals, 1981 to 2010, and while not official yet, the expected 1991 to 2020 normals. As you can see, the average last freeze for most of these locations is trending much earlier in the spring. Just looking at Lexington for instance, the average last freeze is about a week earlier when comparing the 71-2000 normals to the 1991-2020 normals. The same can be said for London, Bowling Green, and Louisville.

Station	Spring Freeze 50%		
	1971-2000	1981-2010	1991-2020*
LEXINGTON BLUEGRASS AP, KY	15-Apr	14-Apr	9-Apr
LOUISVILLE INTL AP, KY	8-Apr	3-Apr	30-Mar
CINCINNATI NORTHERN KENTUCKY INTL AP, KY	20-Apr	16-Apr	21-Apr
PADUCAH BARKLEY REGIONAL AP, KY	7-Apr	8-Apr	6-Apr
LONDON CORBIN AP, KY	19-Apr	16-Apr	12-Apr
BOWLING GREEN WARREN CO AP, KY	11-Apr	9-Apr	4-Apr

* Data Courtesy: Midwestern Regional Climate Center, cli-MATE tools environment, <https://mrcc.illinois.edu/CLIMATE/>

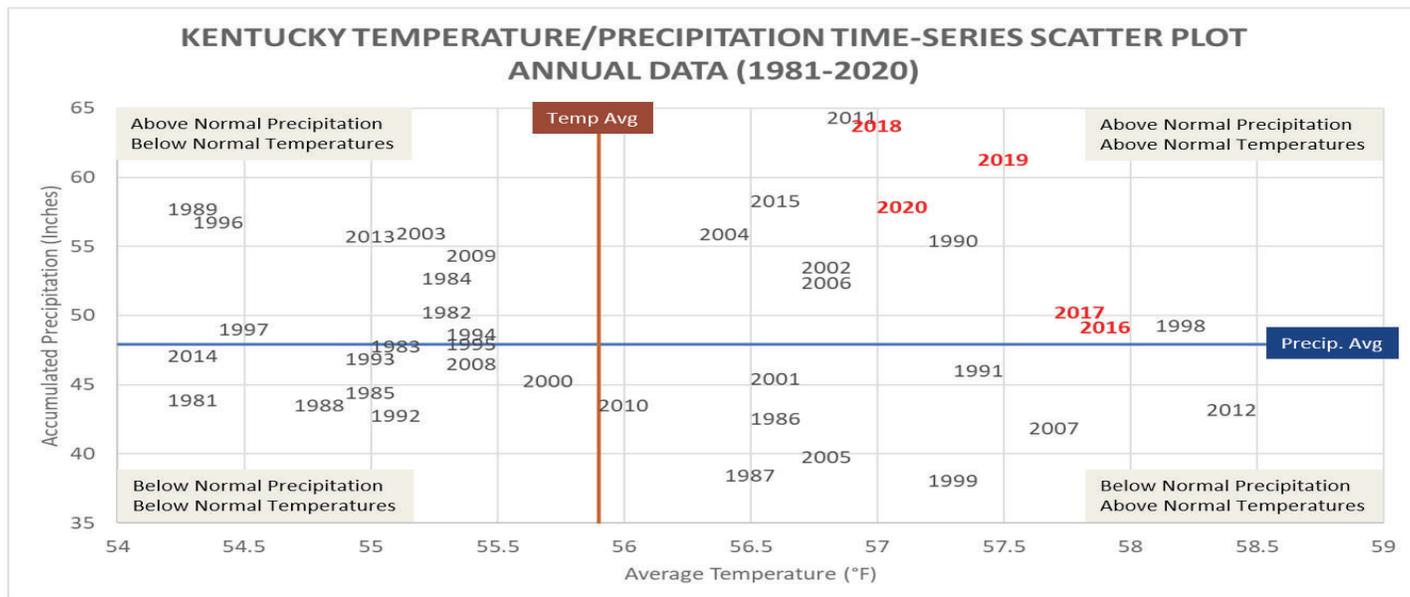
As it pertains to the May freeze last year, this event was quite rare when looking at historical climate data. Central Kentucky and points east dipped into the upper 20s to low 30s on the morning of May 9th. In the chart below, the last date of spring freeze is listed for 5 locations across the state over the past 20 years. Highlighted in red is any dates that have fell in May. Prior to 2021, Lexington had not seen temperatures of 32 or less since 2005. It has never happened in Bowling Green or Paducah over that time period and prior to 2021, had not happened in Jackson either. Bottom line, outside of some of the higher latitudinal locations in Kentucky, hitting temperatures below 32 degrees in May is a rarity.

Last Date of Spring Freeze (<= 32° F) (2000 - 2020)					
Year	Lexington Bluegrass AP	Bowling Green Warren Co AP	Paducah Barkley Rgnl AP	Jackson Julian Carroll AP	Cincinnati / Northern KY AP
2000	9-Apr	9-Apr	9-Apr	9-Apr	9-Apr
2001	18-Apr	19-Apr	18-Apr	18-Apr	25-Apr
2002	19-May	7-Apr	6-Apr	7-Apr	19-May
2003	23-Apr	31-Mar	31-Mar	31-Mar	23-Apr
2004	5-Apr	5-Apr	5-Apr	3-May	4-May
2005	3-May	20-Mar	20-Mar	24-Apr	3-May
2006	9-Apr	29-Mar	9-Apr	9-Apr	9-Apr
2007	10-Apr	13-Apr	9-Apr	10-Apr	14-Apr
2008	29-Apr	16-Apr	15-Apr	25-Mar	15-Apr
2009	8-Apr	8-Apr	30-Mar	8-Apr	9-Apr
2010	18-Apr	27-Mar	7-Mar	27-Mar	28-Apr
2011	1-Apr	1-Apr	31-Mar	1-Apr	1-Apr
2012	13-Apr	12-Apr	12-Apr	12-Apr	12-Apr
2013	5-Apr	25-Apr	25-Apr	3-Apr	25-Apr
2014	16-Apr	16-Apr	16-Apr	16-Apr	16-Apr
2015	24-Apr	5-Apr	29-Mar	29-Mar	24-Apr
2016	10-Apr	3-Apr	3-Apr	10-Apr	16-May
2017	23-Mar	19-Mar	19-Mar	23-Mar	8-May
2018	17-Apr	17-Apr	17-Apr	17-Apr	29-Apr
2019	1-Apr	1-Apr	15-Apr	1-Apr	1-Apr
2020	9-May	15-Apr	15-Apr	9-May	9-May

Table 3 - Data Courtesy: Midwestern Regional Climate Center, cli-MATE tools environment, <https://mrcc.illinois.edu/CLIMATE/>

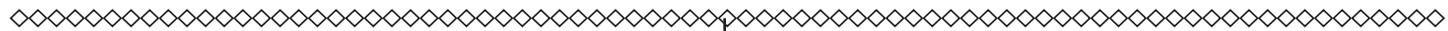
Conclusion

Weather prediction will always be limited in some capacity. Luckily, we have access to a wide range of historical data to monitor our climate and identify any particular trends. We will always see our ups and downs in the Ohio Valley, whether it be warmer/cooler or drier/wetter periods. Saying that, we can see from climate data that warmer and wetter conditions are winning out in recent years across the Lower Ohio Valley.



Data Courtesy: Midwestern Regional Climate Center, cli-MATE Tools Environment, <https://mrcc.illinois.edu/CLIMATE/>

In monitoring the climate across Kentucky, one resource available to producers across the state is a monthly webinar hosted by the Kentucky Climate Center, titled the “Kentucky Monthly Climate Perspective on Drought and Hydrologic Conditions”. This is a free resource that is presented on the first Thursday of every month at 2PM EST/ 1PM CST. Each webinar will provide a look at current climate conditions across Kentucky, future long-range outlooks, and any climate related impacts on agriculture and/or water supplies. Registration for the webinar is available at <https://wku.zoom.us/meeting/register/tJwtdOqrrzwrE9YODNNbFQUxjnPBD3XzPgH->. Recordings will also be available after the webinar on the Kentucky Climate Center YouTube at <https://www.youtube.com/channel/UCDg3h8leOZa0wHap90rX5Rw?app=desktop>.



FRUIT & VEGETABLE HUMOR

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