Indiana's 2024 Growing Season Climate Summary: April - October

The 2024 growing season in Indiana began with unseasonably warm temperatures, causing vegetation to break dormancy approximately two weeks earlier than normal – in late February for the southern region and mid-March for the central and northern areas. April brought wet conditions, making early planting challenging. Early-planted crops benefited from initial soil moisture, while later-planted crops struggled due to limited rainfall in June. In early July, remnants of Hurricane Beryl provided much-needed rainfall, improving crop conditions. Although drought conditions initially improved, parts of Indiana began drying out in August and September. The remnants of Hurricane Helene brought short-lived relief to southern Indiana, but drought rapidly intensified across the entire state. Over two-thirds of Indiana's 92 counties implemented burn bans due to elevated fire concerns during harvest season. Numerous roadside fires and combine-sparked fires occurred. One such fire tragically resulted in the death of a farmer in Clinton County. Despite these challenges, harvest was fast and mostly complete by the end of October. The 2024 growing season concluded with temperatures ranging from 1°F to over 2°F above normal (Figure 1). Precipitation patterns were predominantly drier than normal, with only isolated areas in the northern and eastern regions experiencing slightly above-normal precipitation. There was a lot of variability throughout the growing season, as indicated by the monthly and seasonal average temperatures and precipitation totals (Figure 2). Modified Growing Degree Days (MGDDs) tracked above average throughout the growing season (Figure 3).

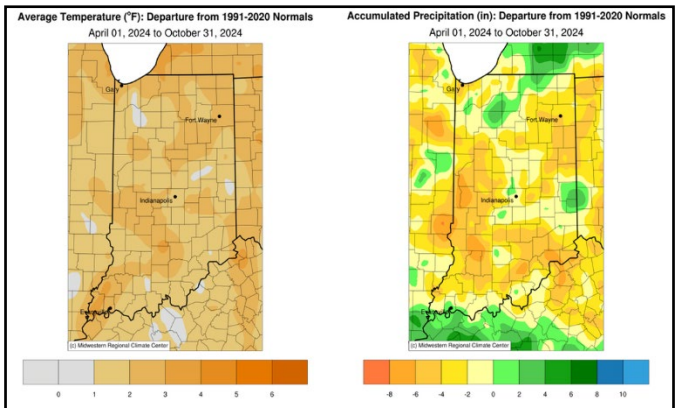

Figure 1: (Left) Average temperature departures for the 2024 growing season. (Right) April-October 2024 precipitation accumulation represented as the departure from the 1991-2020 normal. Obtained from the Midwestern Regional Climate Center.

Division	Avg Temperature (Departure from 1991-2020)							
	Apr	May	Jun	Jul	Aug	Sep	Oct	Apr-Oct
1	51.8 (2.2)	64.6 (3.9)	72.1 (2.0)	71.4 (-1.8)	71.4 (0.1)	67.2 (2.4)	56.8 (3.7)	65.0 (1.8)
2	51.8 (2.3)	64.7 (4.2)	72.2 (2.3)	71.6 (-1.3)	71.6 (0.5)	67.1 (2.6)	56.1 (3.2)	65.0 (2.0)
3	52.2 (2.8)	64.6 (4.3)	71.9 (2.3)	71.6 (-1.2)	71.5 (0.6)	67.4 (3.1)	56.1 (3.4)	65.0 (2.2)
4	54.4 (2.2)	66.8 (4.0)	72.9 (1.4)	72.8 (-1.4)	73.1 (0.5)	68.2 (2.1)	57.8 (3.3)	66.6 (1.7)
5	54.9 (2.9)	67.0 (4.7)	72.6 (1.6)	72.9 (-1.0)	73.0 (0.7)	68.0 (2.2)	57.6 (3.3)	66.6 (2.1)
6	54.1 (2.8)	66.0 (4.4)	71.7 (1.3)	71.9 (-1.4)	72.1 (0.5)	67.2 (2.1)	56.5 (2.7)	65.6 (1.8)
7	58.4 (3.0)	69.0 (3.8)	74.8 (1.1)	76.0 (-0.7)	75.4 (0.2)	70.7 (2.2)	60.1 (3.1)	69.2 (1.8)
8	57.1 (2.6)	67.9 (3.8)	72.9 (0.6)	74.8 (-0.7)	74.3 (0.2)	69.5 (2.1)	58.7 (2.7)	67.9 (1.6)
9	57.5 (3.2)	67.9 (4.1)	73.3 (1.4)	75.1 (-0.7)	74.6 (0.6)	70.0 (2.7)	58.6 (2.8)	68.1 (2.1)
State	54.8 (2.7)	66.6 (4.1)	72.8 (1.6)	73.2 (-1.1)	73.1 (0.5)	68.4 (2.4)	57.7 (3.2)	66.7 (1.9)

Division	Total Precipitation (Departure from 1991-2020)							
	Apr	May	Jun	Jul	Aug	Sep	Oct	Apr-Oct
1	6.72 (2.98)	3.77 (-0.55)	3.71 (-1.04)	6.05 (1.70)	3.42 (-0.65)	1.81 (-1.45)	0.94 (-2.42)	26.42 (-1.43)
2	6.68 (2.92)	4.44 (0.13)	3.99 (-0.58)	5.54 (1.30)	2.39 (-1.61)	2.02 (-1.21)	0.45 (-2.78)	25.51 (-1.83)
3	6.44 (2.69)	4.19 (-0.22)	3.20 (-1.04)	3.92 (-0.09)	2.26 (-1.58)	1.88 (-1.21)	0.49 (-2.50)	22.38 (-3.95)
4	6.96 (2.49)	4.11 (-0.51)	2.50 (-2.56)	5.36 (0.94)	2.58 (-0.76)	2.20 (-0.97)	0.18 (-3.26)	23.89 (-4.63)
5	7.22 (2.84)	5.19 (0.43)	3.07 (-1.97)	4.95 (0.62)	2.97 (-0.54)	2.64 (-0.60)	0.22 (-3.06)	26.26 (-2.28)
6	7.58 (3.38)	3.33 (-1.27)	3.03 (-1.83)	4.36 (0.14)	2.69 (-0.85)	3.28 (0.16)	0.22 (-2.86)	24.49 (-3.13)
7	6.46 (1.38)	5.74 (0.42)	1.92 (-2.86)	5.24 (0.90)	1.78 (-1.41)	4.93 (1.37)	0.19 (-3.36)	26.26 (-3.56)
8	6.27 (1.13)	6.20 (0.85)	1.85 (-2.98)	5.55 (1.25)	2.72 (-0.72)	5.16 (1.61)	0.12 (-3.39)	27.87 (-2.25)
9	5.35 (0.47)	5.18 (-0.04)	1.90 (-3.01)	5.23 (0.86)	3.19 (-0.41)	5.34 (2.04)	0.24 (-3.17)	26.43 (-3.26)
State	6.67 (2.28)	4.77 (-0.01)	2.81 (-1.99)	5.17 (0.88)	2.65 (-0.95)	3.19 (-0.10)	0.34 (-2.99)	25.60 (-2.88)

IN Climate Divisions

Figure 2: (Top) average monthly and growing season (April-October) temperatures in degrees Fahrenheit, categorized by Indiana Climate Division. It also includes the monthly temperature departures (in parentheses) from the 1991-2020 climatological average. (Bottom) monthly and growing season precipitation totals in inches, similarly broken down by Indiana Climate Division. This section also provides the monthly precipitation departures from the 1991-2020 climatological average.

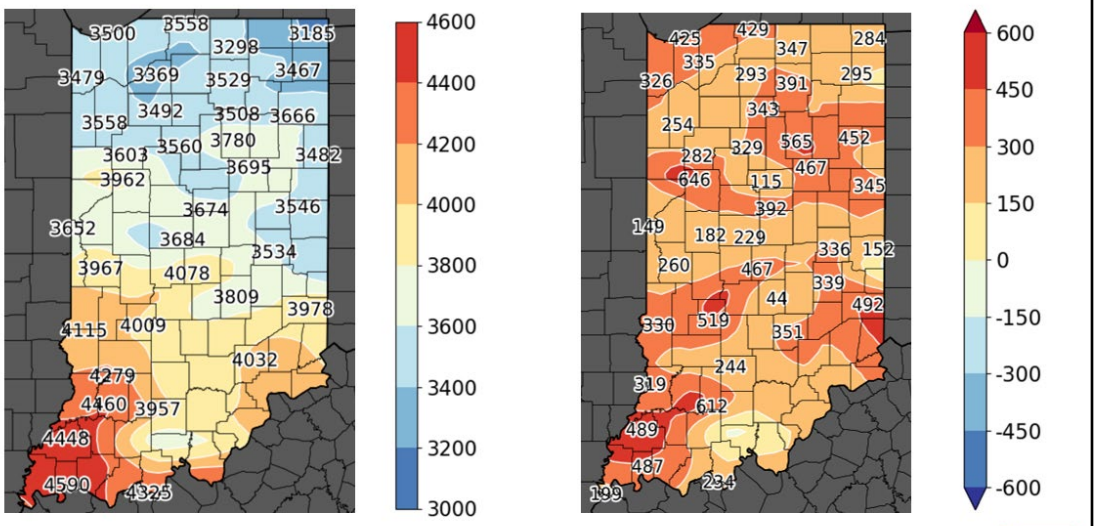

Figure 3: (Left) accumulated MGDDs (base 50F, ceiling 86F) from April to October 2024. (Right) accumulated MGDDs represented as the departure from the 1951-2023 long term average.

Monthly Summaries

April

April began with a cool spell, featuring several mornings with frost advisories and freeze warnings, which is not uncommon. The unusually warm winter caused early bud break, sparking freeze concerns for perennial crops. However, temperatures quickly rebounded. The Indianapolis International Airport recorded 80°F four times throughout the month, exceeding the 1931-2024 average of 1.8 days. Indiana averaged temperatures that were 2.7°F above normal for the month, which drove above-normal MGDDs. The main challenge was that fields were too wet to plant for most farmers. Precipitation was persistent and above normal (Figure 4). The Indianapolis International Airport measured at least a trace of precipitation on 19 days, keeping planting windows non-existent or very short. The only benefit was that Indiana could break free of the lingering winter dryness by the month's end. April ended up the 4th wettest on record since 1895. Only 8 percent of the corn and soybean crops were planted, which was a few points behind the 5-year averages.

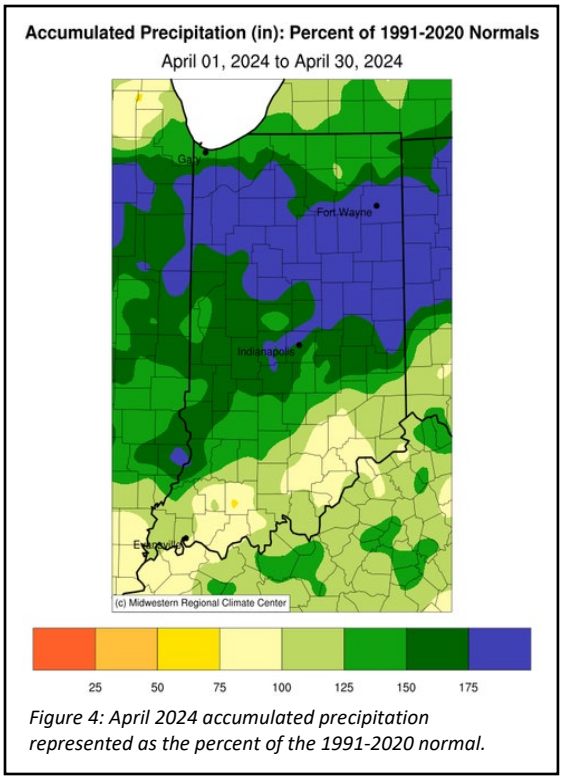

Figure 4: April 2024 accumulated precipitation represented as the percent of the 1991-2020 normal.

Figure 5: Isolated heavy rains resulted in ponded fields, causing concern for soybean establishment on May 21, 2024. Photo credit: Dr. Shaun Casteel, Department of Agronomy, Purdue University

May

On paper, the month of May concluded with near-normal precipitation, but the lingering effects of April's above-normal rainfall and May's variable rainfall left many producers concerned about saturated fields. Fortunately, a drier start to May allowed farmers to plant. By mid-month, corn and soybean planting progress had reached 30 percent, which was still behind the 5-year averages. Heavy rains returned to portions of Indiana in the third week of May, raising concerns about further delayed progress, "wet feet" in crops, and weed management issues (Figure 5). Less impacted areas were able to continue planting moving into the last week of May. Winter wheat quality and growth improved throughout the month as a result of the well above-normal temperatures. Lawns also thrived in the favorable conditions as lawns may have been mowed more than once a week. By the end of the month, 70 percent of corn and soybeans were planted statewide, surpassing the 5-year averages.

June

Throughout June, dryness returned to Indiana, prompting the US Drought Monitor authors to designate moderate drought (D1) in parts of west-central and southeastern regions. Most of the state experienced precipitation levels 1-4 inches below normal for the month, with the statewide average nearly 2 inches below normal (Figure 6). By the month's end, over 80 percent of Indiana was in either abnormally dry (D0) or moderate drought (D1) conditions. This dryness led to browning lawns, dropping creek and lake levels, and crops showing signs of stress. While most corn and soybeans were planted by mid-June, later-planted crops struggled to emerge due to the persistent dryness. By the end of June, earlier planted corn began to tassel, and the Purdue Plant & Diagnostic Lab confirmed cases of gray leaf spot, tar spot, and common rust in the lower canopies of corn. First cuttings of hay occurred ahead of schedule with above-normal yields.

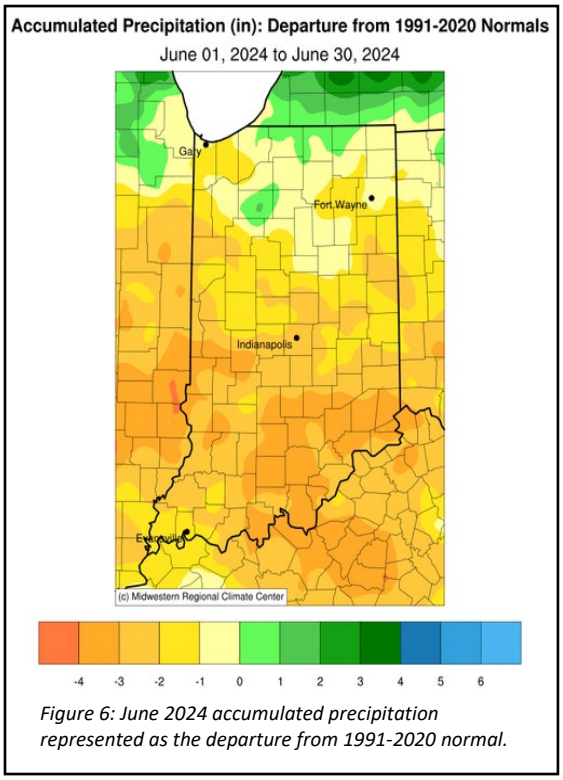

Figure 6: June 2024 accumulated precipitation represented as the departure from 1991-2020 normal.

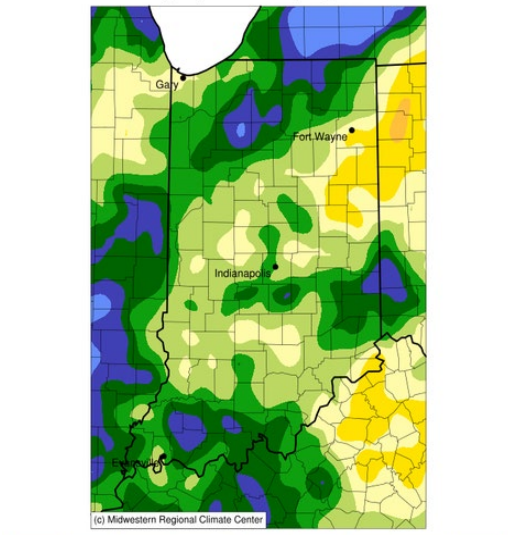

Figure 7: July 2024 accumulated precipitation represented as the percent of the 1991-2020 normal.

July

The remnants of Hurricane Beryl arrived at a crucial time as crops were entering reproductive phases. The system caused sporadic power outages and blown-over corn, particularly in the later planted fields. Rensselaer, IN, recorded 6.05 inches of rain on the morning of July 10 resulting from Beryl. Less than a week later, a derecho—a widespread, long-lived windstorm associated with thunderstorms—swept through the area, bringing 75 mph wind gusts, downed trees and power lines, and crop damage. Despite these challenges, July's precipitation ended slightly above normal across the state, which provided a brief reprieve from lingering drought conditions (Figure 7). The prolonged wetness on crops created favorable conditions for disease development, leading to reports of tar spot, gray leaf spot, northern corn leaf blight, and common rust. Temperatures were below normal across the state, which slowed the accumulation of MGDDs but did not impact the overall growth of crops.

August

August temperatures in Indiana were generally normal, though there were several notable temperature swings throughout the month. At the Indianapolis International Airport, high temperatures exceeded 90°F on seven days, compared to the historical average of three days. The station also recorded a slightly higher-than-average number of days with highs below 80°F. Statewide average precipitation was slightly below normal; most areas experienced below-normal precipitation, though isolated locations recorded above-normal amounts (Figure 8). By the end of August, just over 18 percent of the state was in moderate drought, and 90 percent of the state fell into abnormally dry or drought conditions. Rapid drying of crops, declining streamflows, and dormant lawns and pastures were common sights across Indiana. The wet weather from July contributed to the confirmation of southern rust in the state, and many additional counties also reported the development of tar spot.

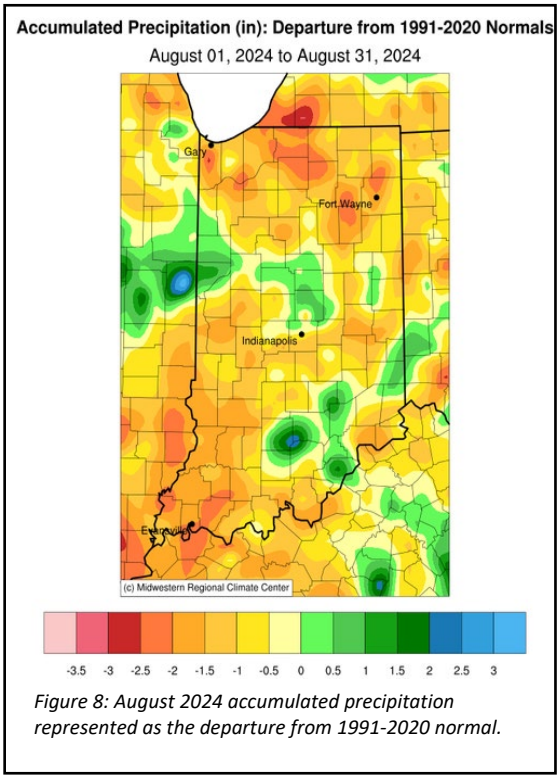

Figure 8: August 2024 accumulated precipitation represented as the departure from 1991-2020 normal.

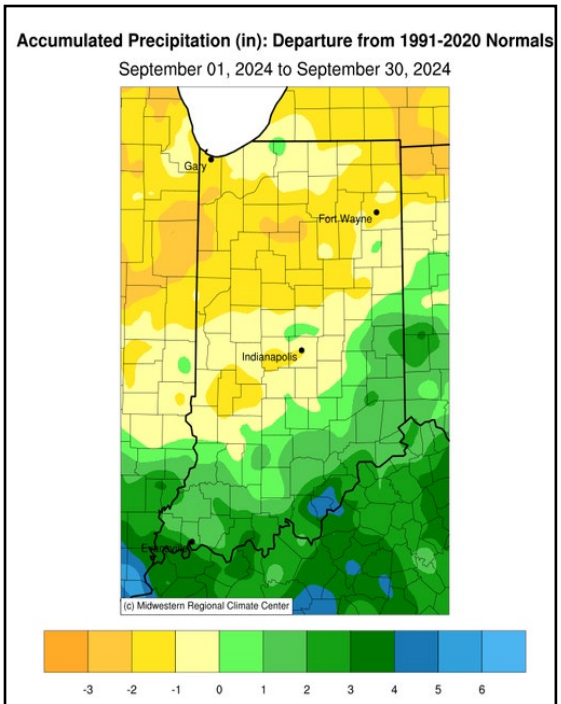

Figure 9: September 2024 accumulated precipitation represented as the departure from 1991-2020 normal.

September

Temperatures in Indiana averaged nearly 2.5°F above normal statewide, although there were periods when nighttime lows dipped well below normal. Drought conditions expanded across the state early in the month but improved in southern Indiana thanks to the remnants of Hurricane Helene in late September. Rain accumulations of nearly 5 inches were observed in extreme southern Indiana (Figure 9). The rain's impact was visible in greener lawns and pastures. However, soils, which were very dry before these rain events, absorbed much of the rain. Consequently, hydrological responses such as rising pond, stream, and aquifer levels lagged. Helene also brought wind gusts up to 70 mph and caused power outages in the state's southern tier. Despite the late-month rainfall, rapid drying of crops was observed, allowing many producers to begin harvesting earlier than usual. By the end of September, 20 percent of the corn crop was harvested for grain, and 23 percent of soybeans were harvested.

October

October 2024 marked an exceptionally dry period for Indiana, ranking as the second driest October since 1895. The state received a mere 0.34 inches of precipitation, a staggering 2.99 inches below normal. 18 of Indiana's longest-recording weather stations further emphasized this extreme dryness, with over 70 years of data documenting their driest October on record. The situation was exacerbated by long-term precipitation deficits across the state. Drought conditions expanded dramatically, particularly over the state's northern half, with severe drought taking hold of a large portion of northern Indiana by the end of the month (Figure 10). Field fires became prevalent statewide, prompting many counties to implement burn bans for a significant portion of October. The dry conditions facilitated a rapid harvest, allowing producers, in most cases, to deposit crops directly into bins without using dryers. By the end of October, 77% of corn and 87% of soybeans were harvested. Despite the challenging conditions throughout the growing season, crop yields varied widely, but producers were generally satisfied with the outcomes.

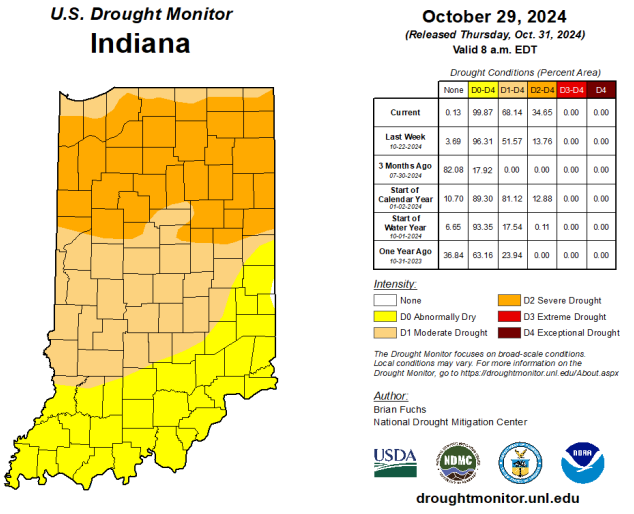

Figure 10: The October 29, 2024 US Drought Monitor map indicating nearly the entire state in abnormally dry or drought status. Over 34 percent of the state was in severe drought status.

In-season data via the Purdue Mesonet

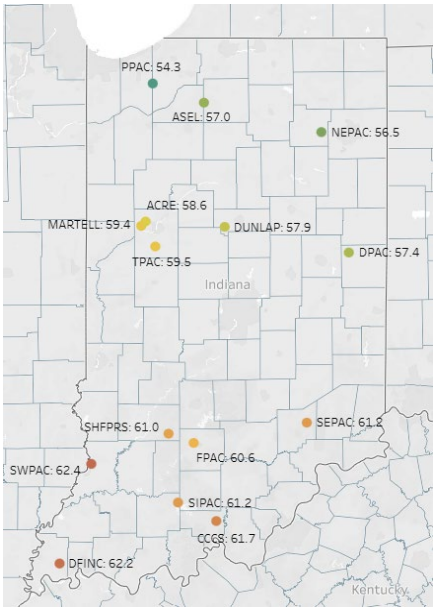

Figure 11: Purdue Mesonet station locations.

The Indiana State Climate Office (INSCO), led by State Climatologist Dr. Beth Hall and hosted by Purdue University's Department of Agronomy, has been at the heart of applied climate science in Indiana since 1956. With a mission to keep an eye on the state's climate conditions and their impact on agriculture, drought, and all those other environmental issues that impact the state. A critical component of this mission? The Purdue Mesonet—a statewide, research-grade weather network that provides observational data to help people make informed decisions.

The INSCO (indianaclimate.org) serves various sectors in Indiana, from agriculture and legal to construction, forensics, government, insurance, news media, research, education, and utilities. For instance, agricultural producers tap into the Purdue Mesonet's Data Hub (purduemesonet.org) to monitor temperature inversions—those conditions where temperatures at boom height are warmer than near the ground—which can cause pesticides to wander off target. Purdue Agriculture researchers rely on Purdue Mesonet data from 15 stations across the state for decision-making before, during, and after crop trials at Purdue Agricultural Centers (PACs) across the state (Figure 11). The Purdue Mesonet's data are also a go-to for tracking modified growing degree days (MGDD) to assess crop progress and the environmental conditions favorable for plant disease development.

The Purdue Mesonet monitors a comprehensive array of environmental parameters. These include air temperature at various heights, soil temperature and moisture at depths of 2, 4, 8, and 20 inches, solar radiation, relative humidity, precipitation, wind speed and direction, and temperature inversions. This wealth of data is readily accessible (and free) through the Purdue Mesonet Data Hub (purduemesonet.org). Users can explore the information via intuitive dashboards, examine time series data, or directly download the raw data for further analysis. This extensive monitoring and data availability make the Purdue Mesonet an invaluable resource for researchers, agriculturalists, and weather enthusiasts.

For questions about the Purdue Mesonet or the Indiana State Climate Office, please email in-sco@purdue.edu.

Acknowledgments

Iowa Environmental Mesonet
(https://mesonet.agron.iastate.edu/)
Midwestern Regional Climate Center
(https://mrcc.purdue.edu)
Purdue Pest & Crop Newsletter
(https://extension.entm.purdue.edu/newsletters/pestandcrop/past-issues/)
USDA National Agricultural Statistics Service Indiana Crop Weather Reports
(https://www.nass.usda.gov/Statistics_by_State/Indiana/Publications/Crop_Progress_&_Condition/index.php)