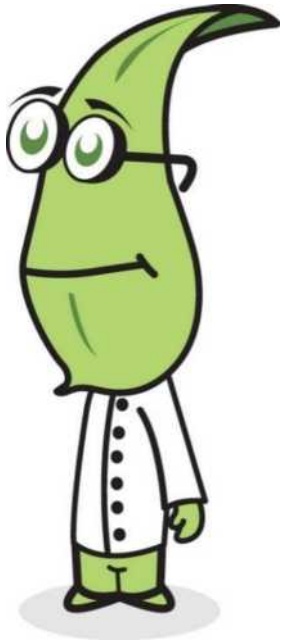
Wales Spring Bulbs for Schools Report 2006-2023



AMGUEDDFA CYMRU

Edina Trust Bulb Project

Noddir gan Lywodraeth Cymru
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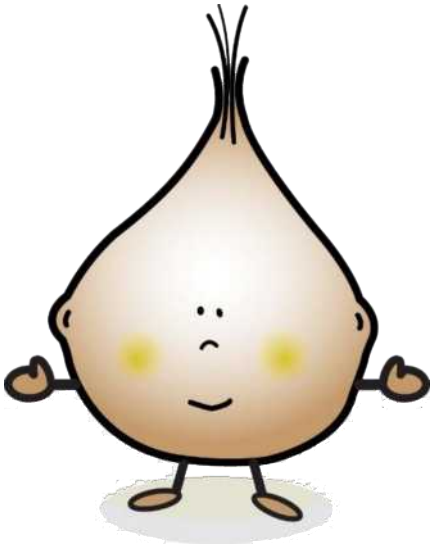


Summary 2006-2023

• The following summary looks at key patterns and trends evident in the data recorded by schools over the last 18 years.

• Weather readings are taken between November and March, meaning that records for each year include readings from the November and December of the previous year. For example, when the report talks about results for 2006, it's referring to data taken from November 2005 to March 2006.

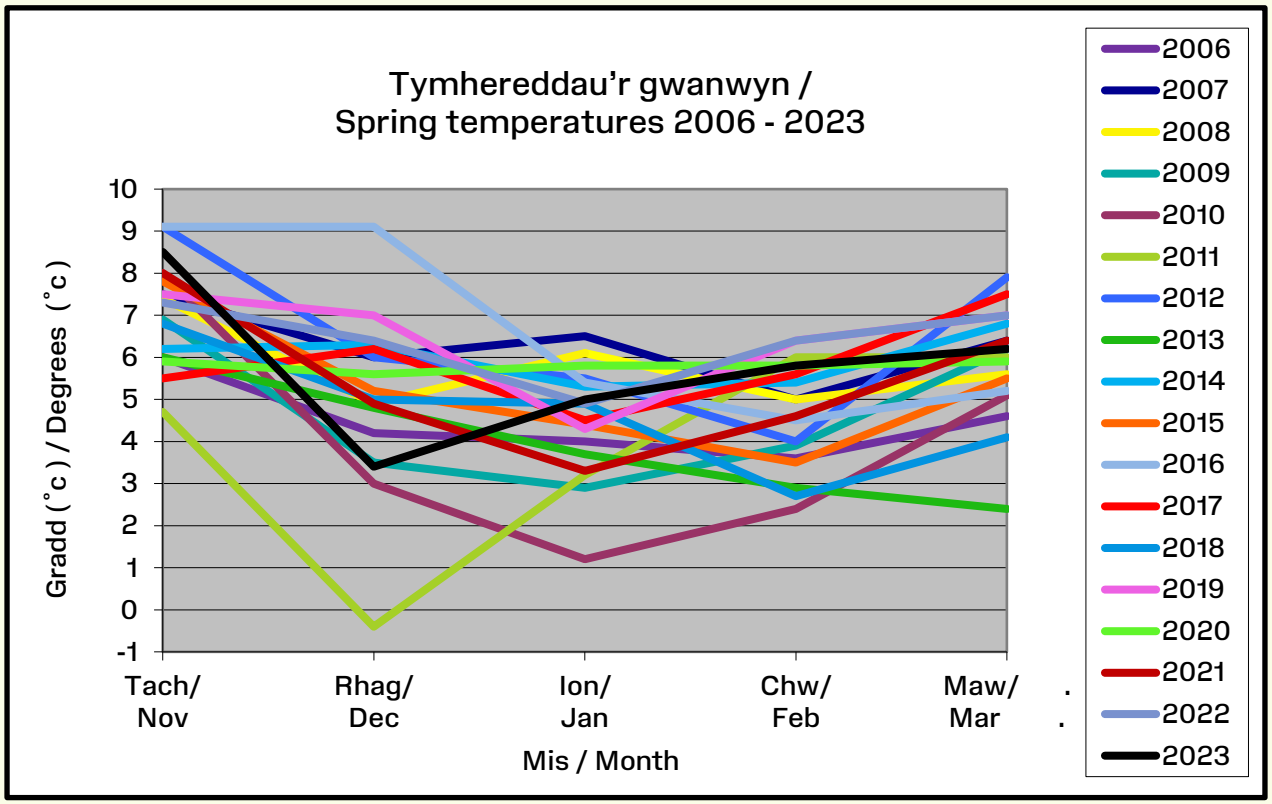
• You can download the data to study yourself at: https://museum.wales/spring-bulbs/

Welsh results table 2006-2023

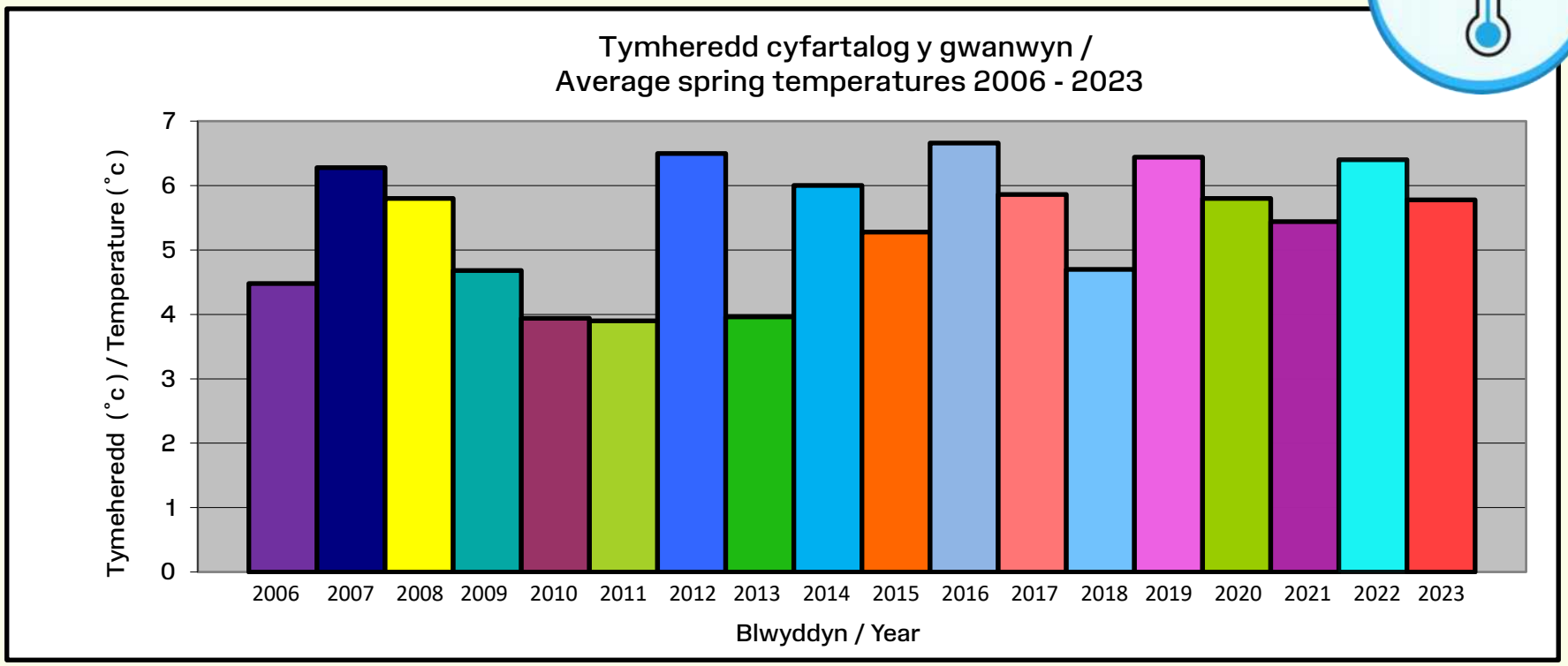
Blwyddyn/Year	Dyddiad blodeuo'r crocws / Crocus flowering date	Dyddiad blodeuo'r cenin Pedr / Daffodil flowering date	Tymheredd / Temperature (°c)	Glawiad / Rainfall (mm)	Oriau o haul / Hours of sunshine
2023	06-Mar	23-Mar	5.8	161.6	60.5
2022	02-Mar	04-Mar	6.4	115.7	70.6
2021	03-Mar	05-Mar	5.4	169.6	57.5
2020	29-Feb	27-Feb	5.8	175.6	66.9
2019	21-Feb	27-Feb	6.4	149.0	67.0
2018	01-Mar	21-Mar	4.7	150.8	60.3
2017	05-Mar	08-Mar	5.9	121.0	61.5
2016	05-Mar	13-Mar	6.7	232.6	58.7
2015	02-Mar	10-Mar	5.3	136.7	74.2
2014	09-Mar	12-Mar	6.0	187.0	69.0
2013	19-Mar	29-Mar	4.0	154.0	65.0
2012	05-Mar	10-Mar	6.5	83.0	74.0
2011	03-Mar	12-Mar	3.9	100.0	81.0
2010	06-Mar	24-Mar	3.9	151.0	77.0
2009	13-Mar	07-Mar	4.7	97.0	78.0
2008	16-Feb	14-Feb	5.8	158.0	83.0
2007	16-Feb	06-Mar	6.3	165.0	79.0
2006	25-Feb	19-Mar	4.5	66.0	76.0
Cyfartalog / Average	**2 Mawrth / March**	**10 Mawrth / March**	**5.4**	**143**	**70**

2023 saw later than average flowering dates for the crocus and the daffodil. Let's look in more detail at the temperature, rainfall and hours of sunshine to see if we can figure out why our plants flowered when they did!

Average temperatures in Wales for the period November-March for the years 2006-2023

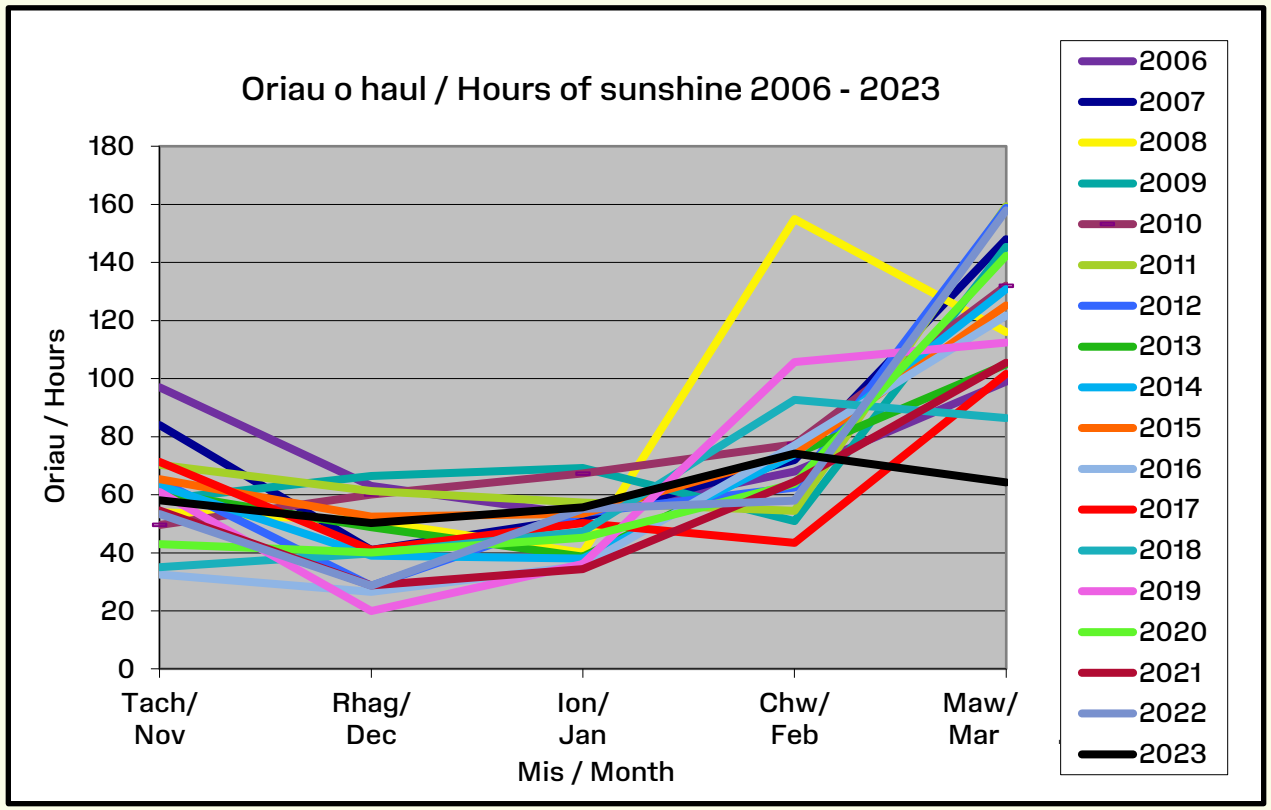


The line chart shows average temperatures for the period November to March in Wales since 2006. We can see that 2023 had the third highest average temperatures for November and the third lowest for December.

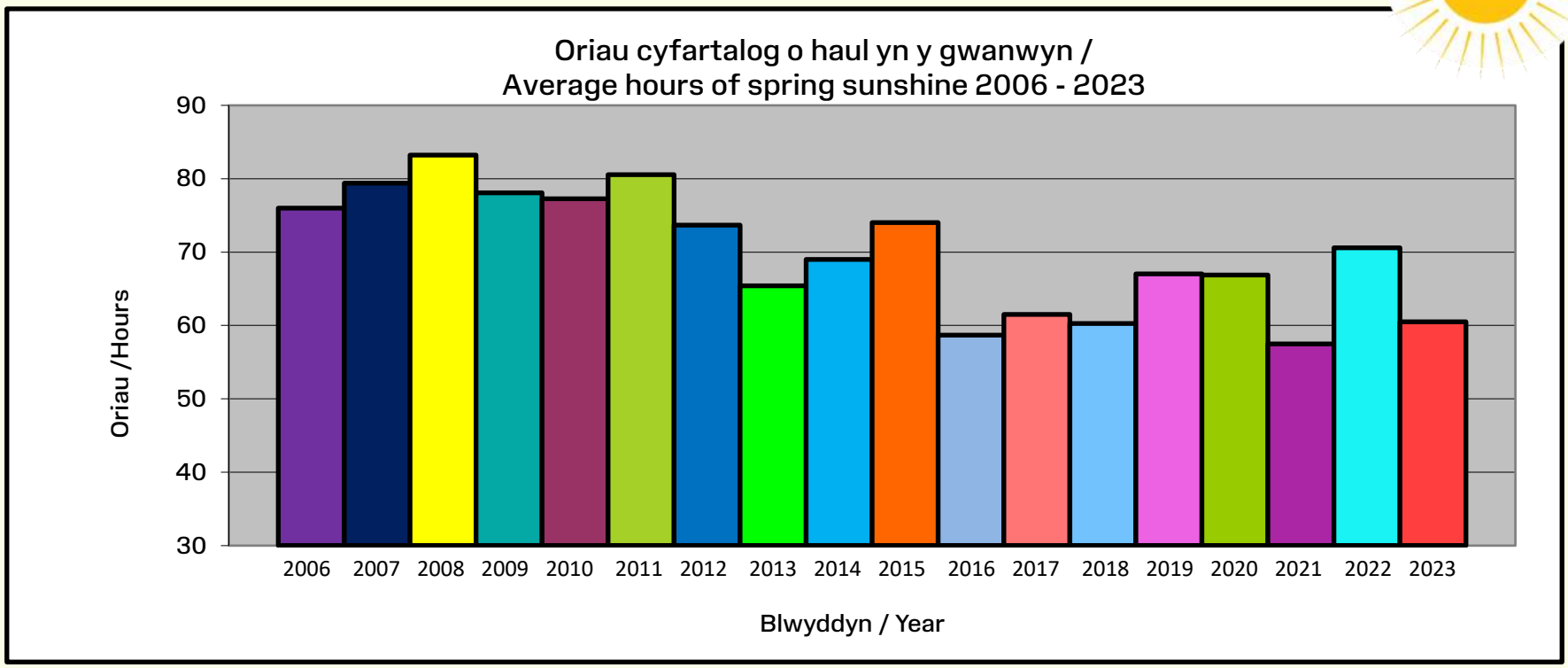


The bar chart shows average temperatures in Wales for the period November to March for the years 2006 to 2023. 2023 saw average temperatures for this period when compared to previous years.

Average hours of sunshine in Wales for the period November-March for the years 2006-2023

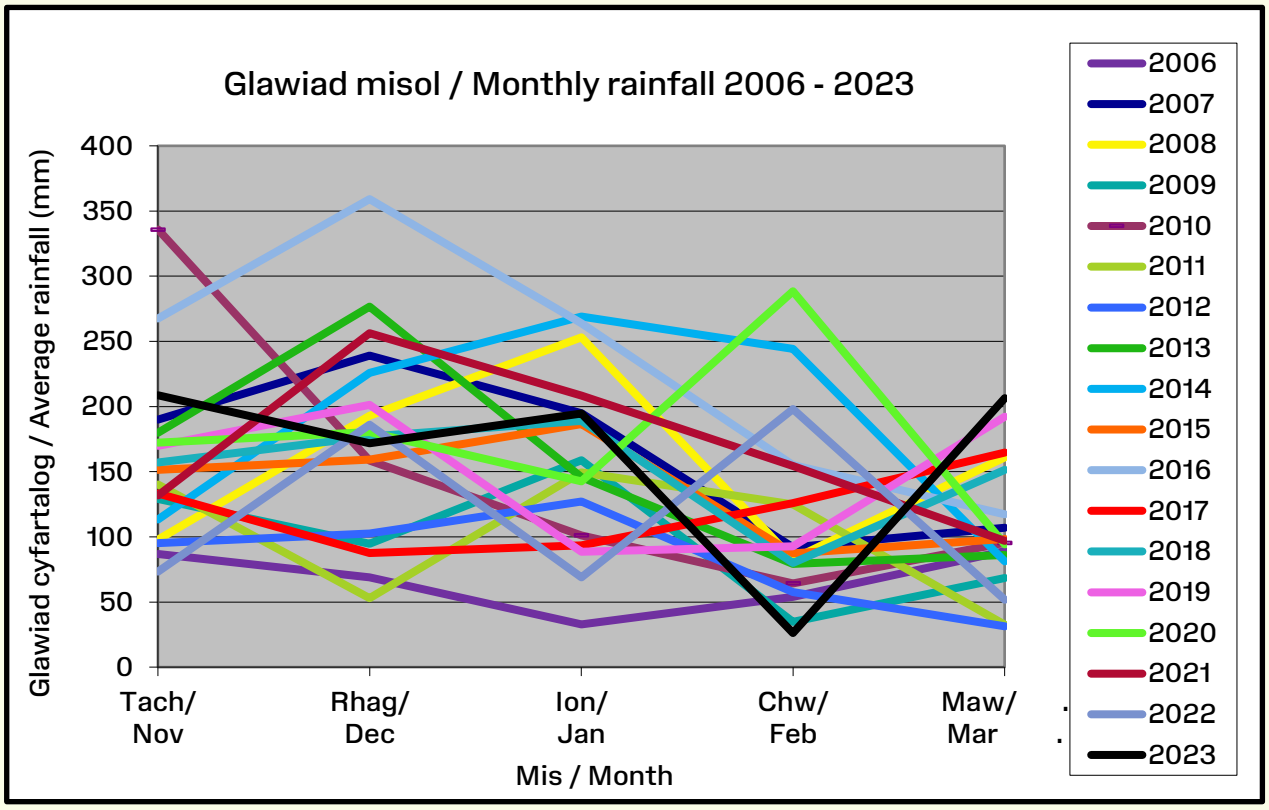


We can see from the line chart that 2023 had the lowest average hours of sunshine for March since our study began. The MET Office have reported that 2023 was the second dullest March in a series dating back to 1910. In that time, only 1936 saw less sunshine in March!

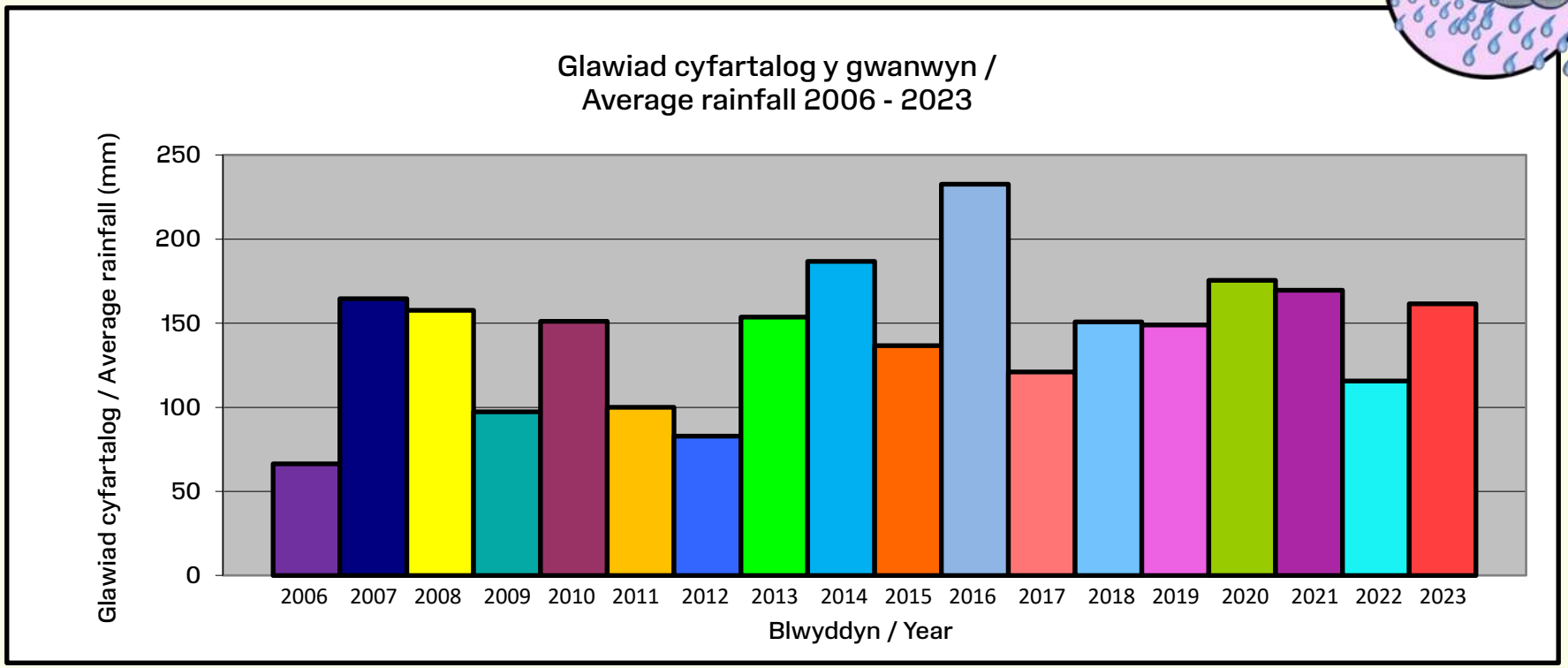


We can see from the chart that 2023 saw lower than average hours of sunlight for the period November-March. 2021 saw the lowest average hours of sunshine of the investigation at 57.5 hours. It's interesting to note that the years 2006-2012 all saw higher than average hours of sunshine and that since then most years have seen below average hours of sunshine.

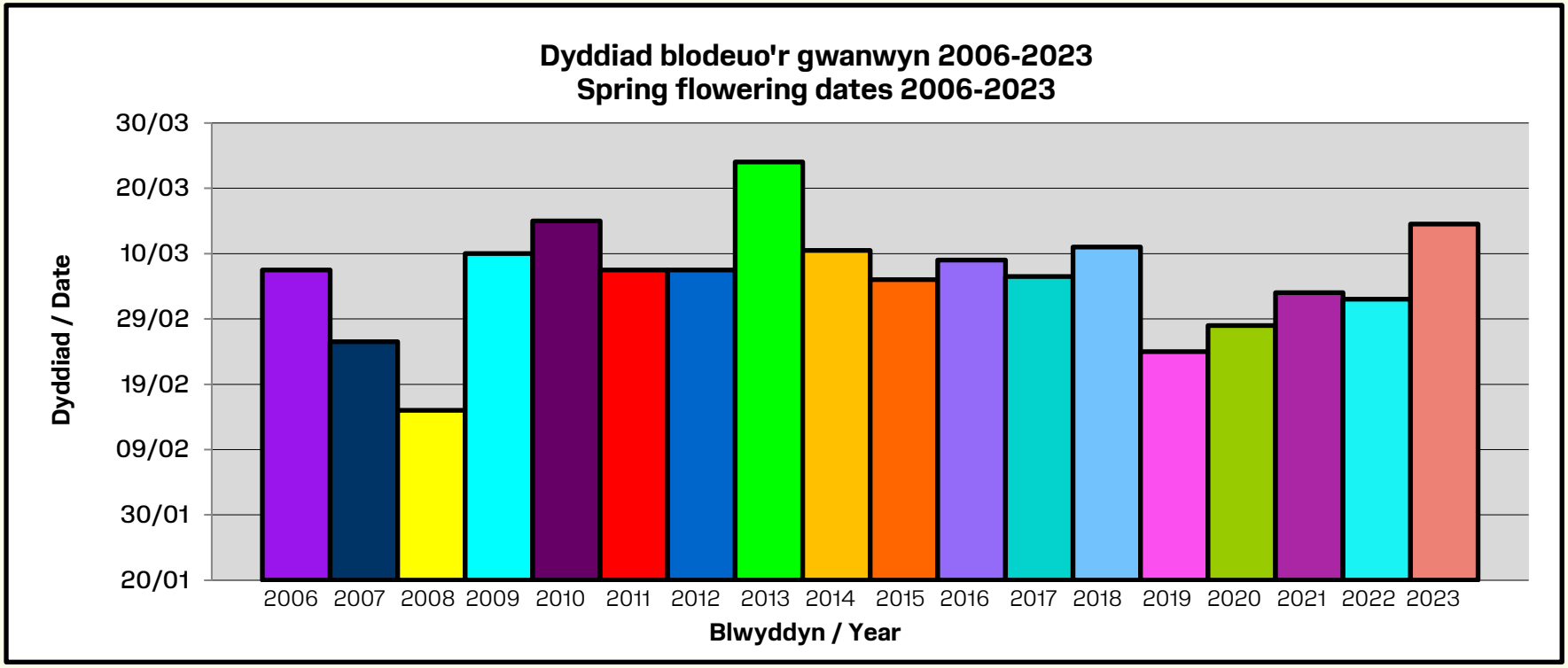
Average monthly rainfall in Wales for the period November to March for the years 2006 to 2023



The chart shows that 2023 saw the lowest rainfall of our investigation for February, and the highest rainfall for March. It also saw the third highest rainfall for November. The MET Office has stated that 2023 saw the wettest March since 1981 and the fifth wettest in a series dating back to 1836!



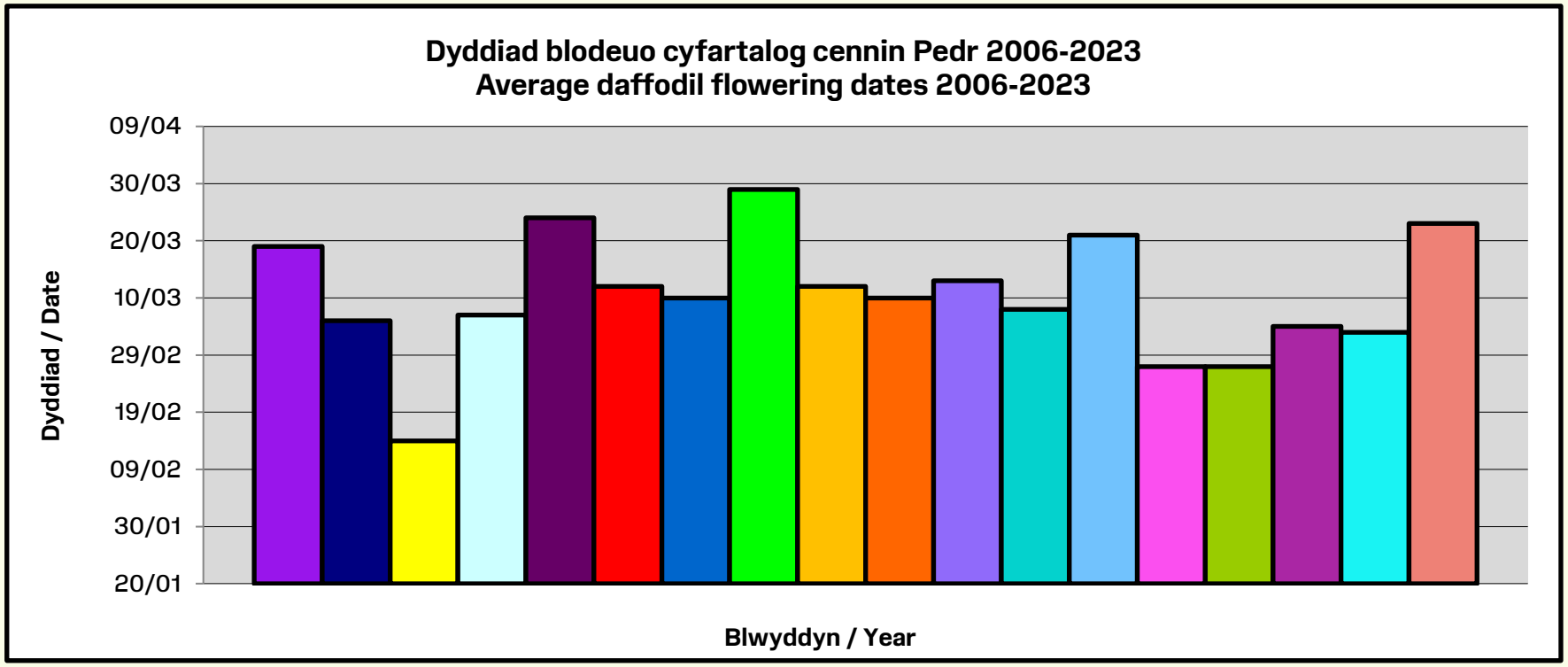
The bar chart shows average rainfall for the period November-March for the years 2006 to 2023. We can see that 2023 was the fifth wettest year of our investigation. There's 167mm difference between the year that saw the highest rainfall (2016) and the year that saw the lowest (2006).



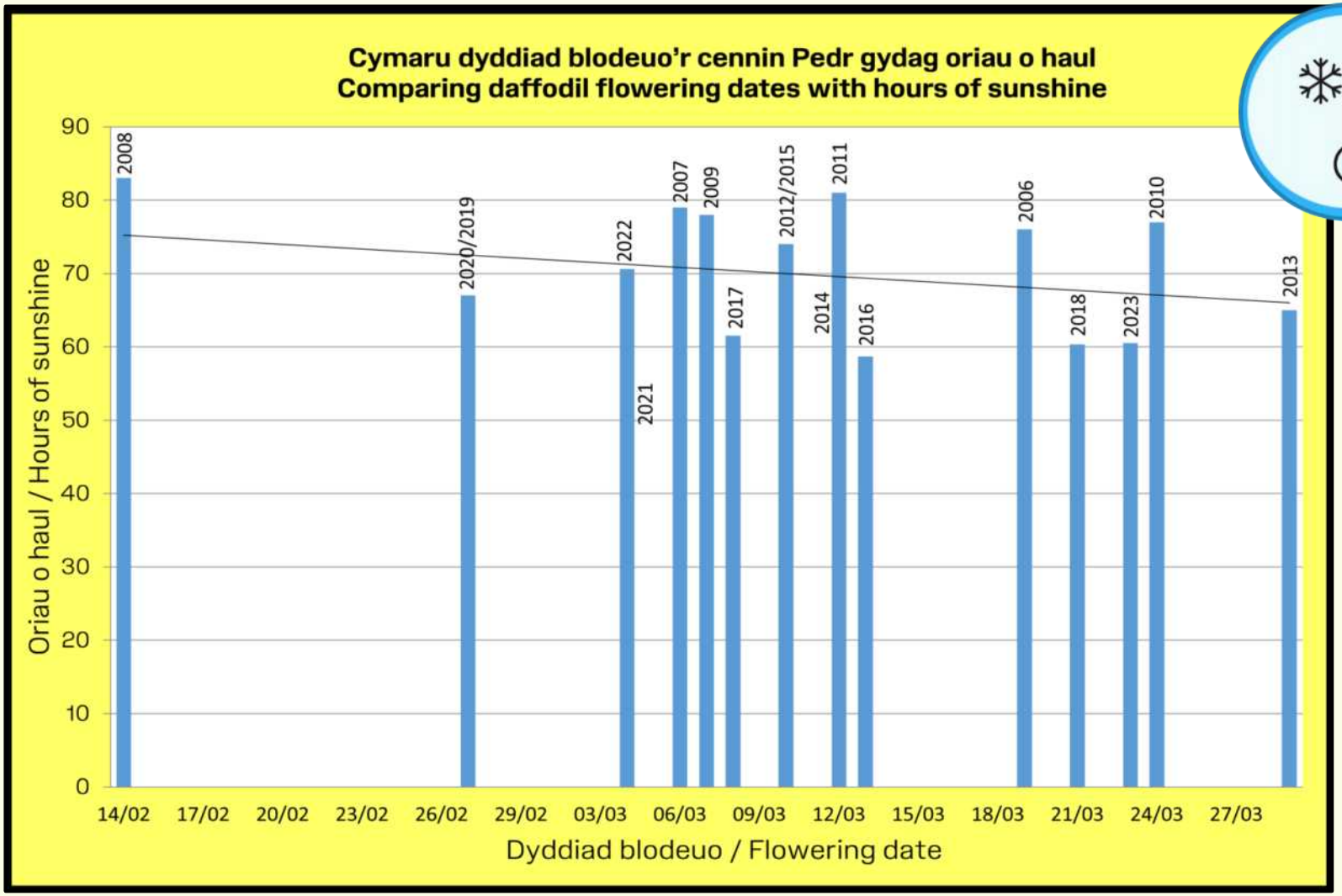
The bar chart shows the average flowering dates for Wales since the project began in 2006. The average flowering date for 2023 for both the crocus and daffodil dates combined is 14 March. Can you see which year saw the earliest flowering date?

Click here to see if you are right!

How does the weather effect flowering dates for daffodils?

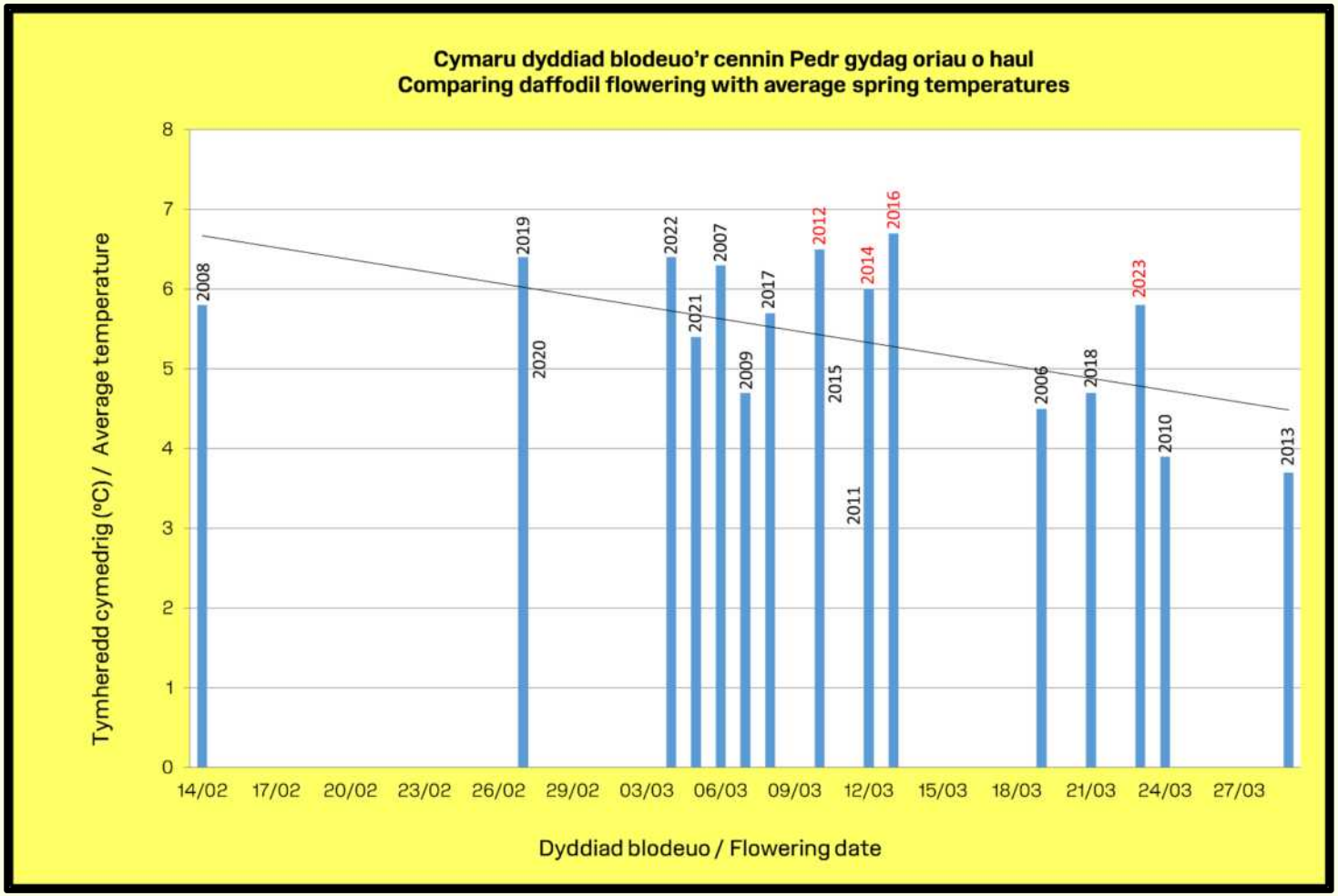


The bar chart shows that 2023 saw the third latest flowering date for the daffodil. Only 2010 and 2013 saw daffodils flower later.



The trend shows that daffodils flower later when temperatures are lower. But there are some exceptions, can you spot them?

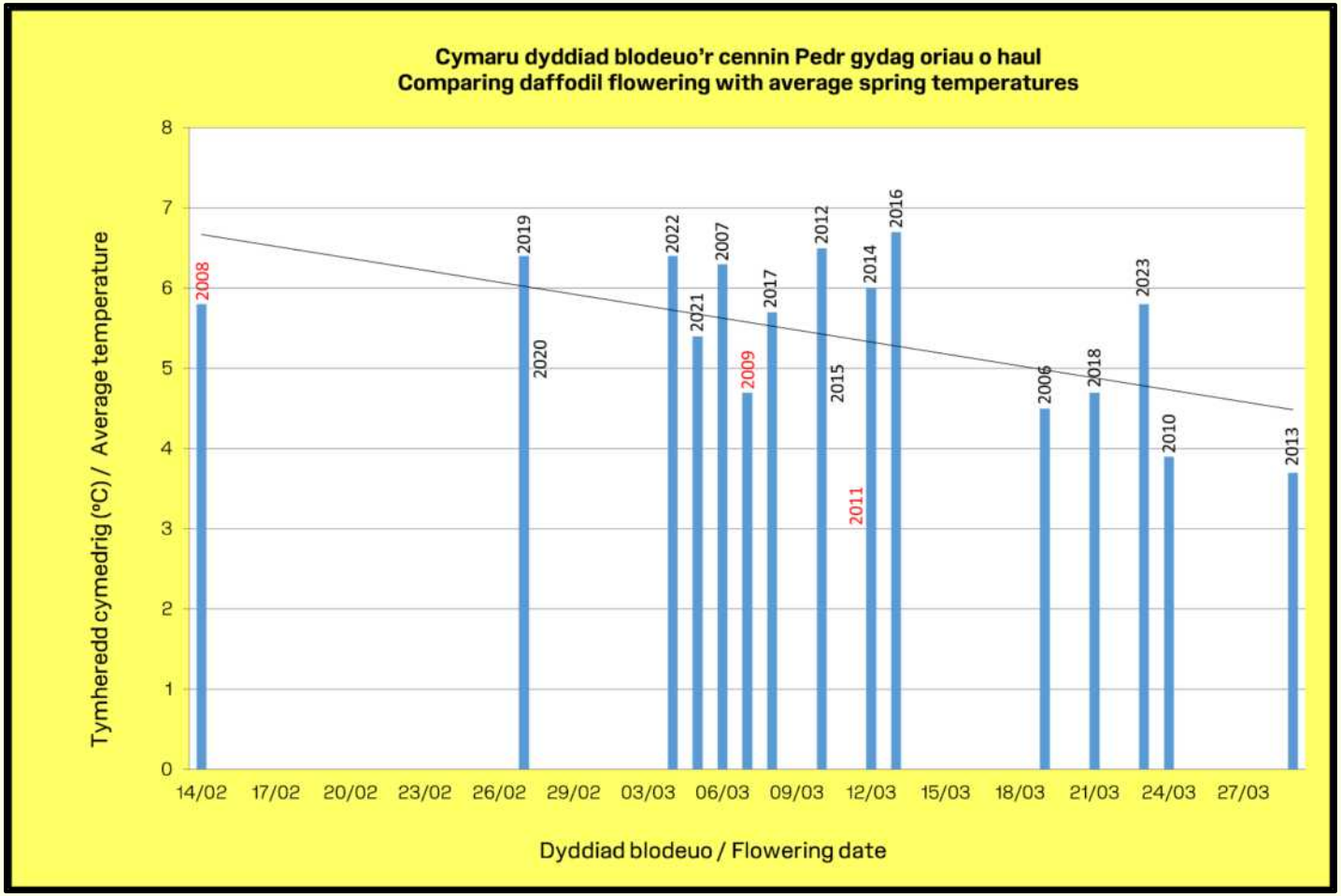
Top tip: The black line is only an indication of the pattern we'd expect to see. Years don't have to meet this line exactly to fit our trend.



Q: What years would we have expected to flower earlier?

A: 2012, 2014, 2016 & 2023

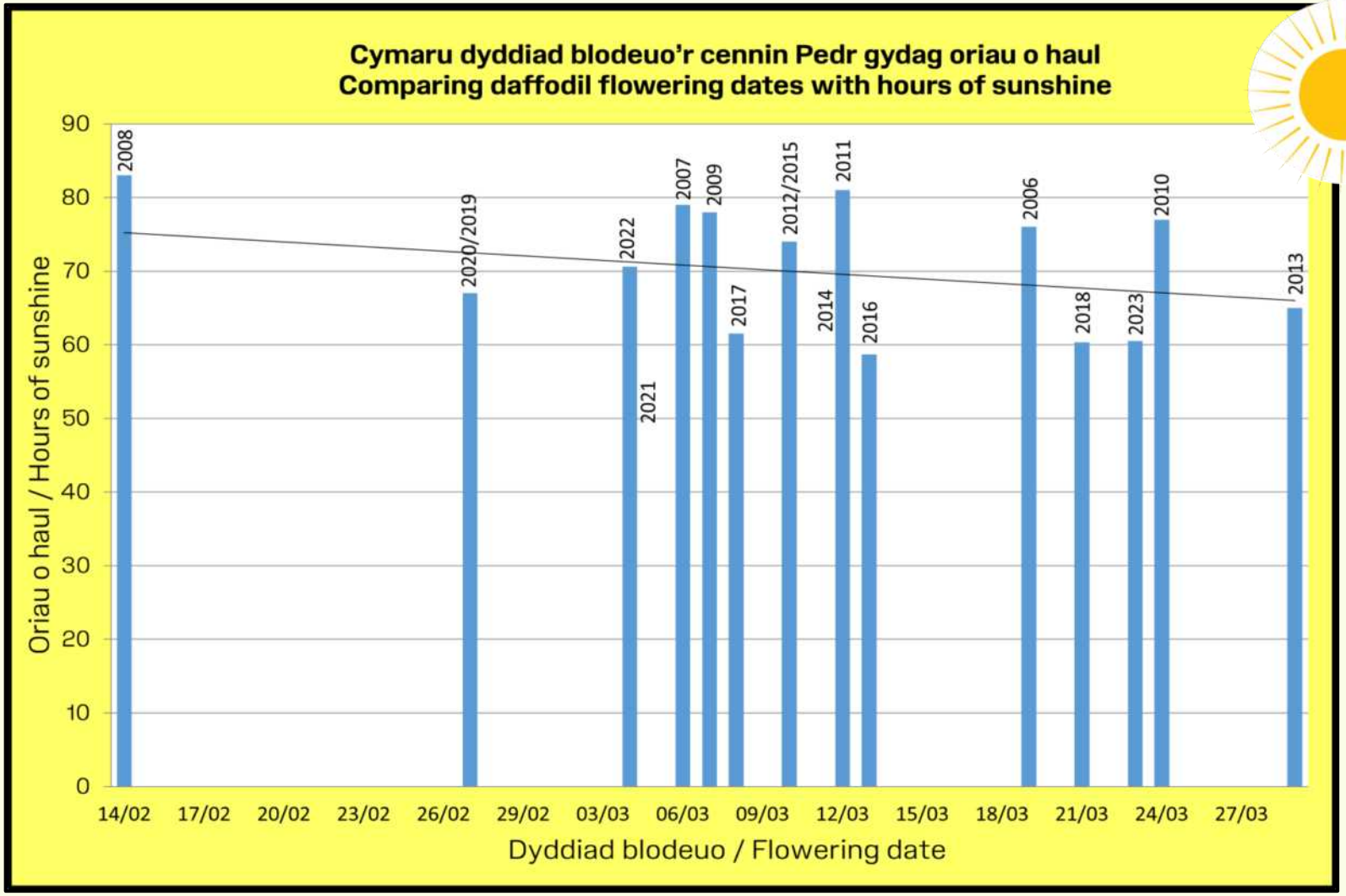
Possible explanation: Although temperatures were high in 2012, 2014 & 2016 flowers did not open early. This is probably because hours of sunshine remained low until March in these years. In 2023, temperatures dipped to the lowest of our project for March.



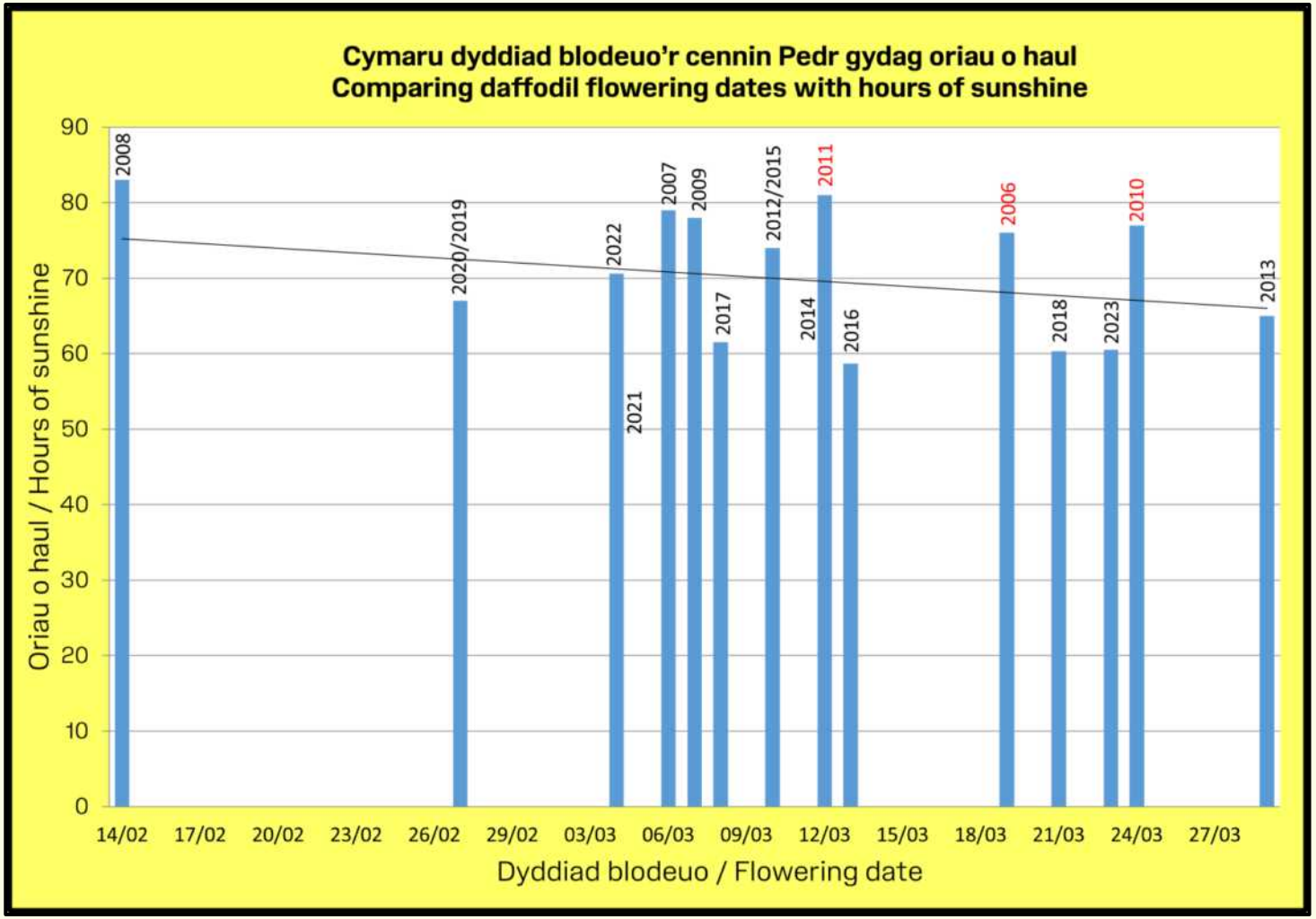
Q: What years would we have expected to flower later?

A: 2008, 2009 & 2011

Possible explanation: 2011 saw the second highest temperatures for February since the project began and 2009 saw a sharp increase in temperature in February and the driest February of the project. Plants may have flowered early in 2008 because this year saw higher than average temperatures (including the second warmest January) and the highest hours of sunshine.



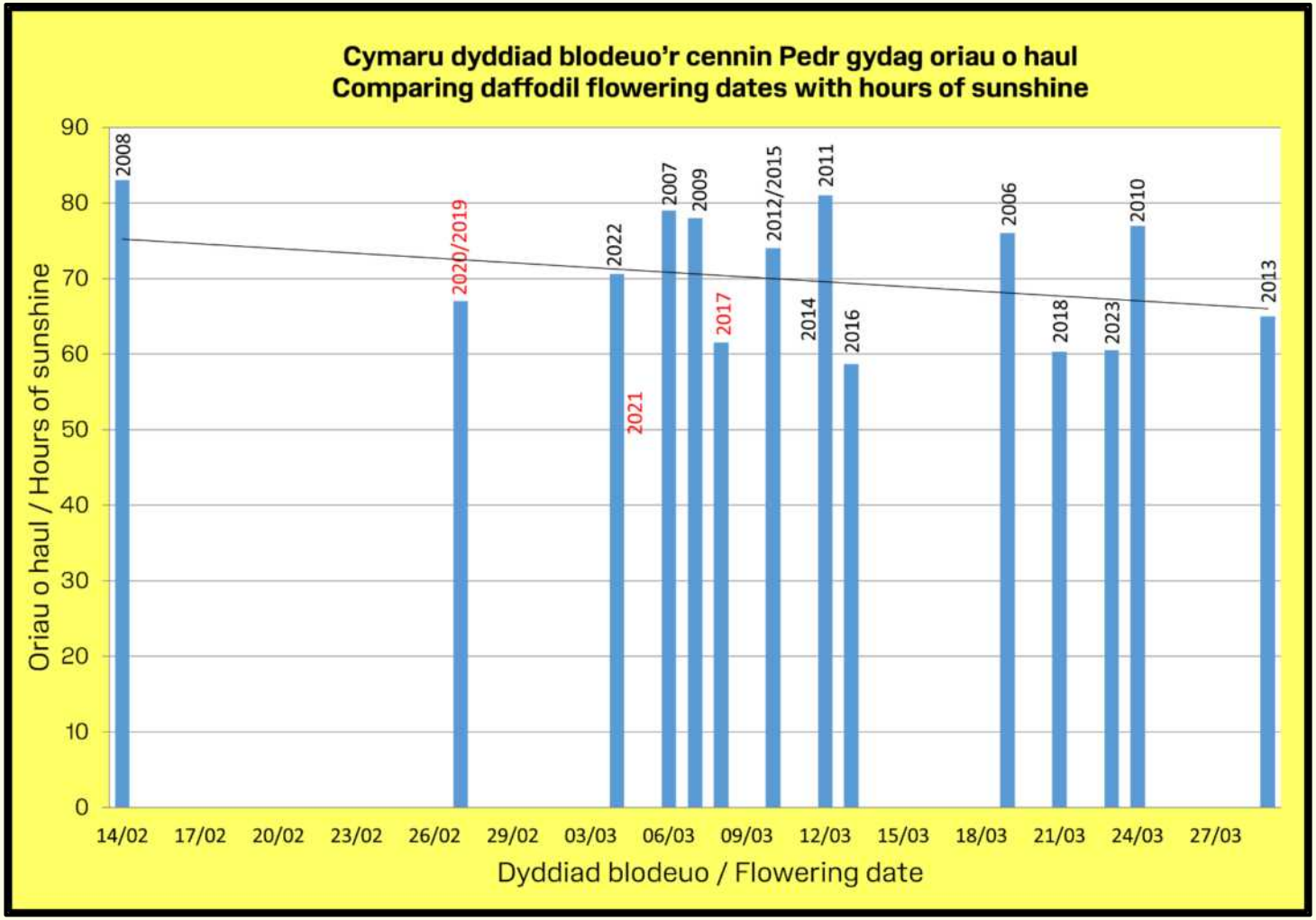
The trend shows that when hours of sunshine are lower, daffodils open later. But there are some exceptions, can you spot them?



Q: What years would we have expected to flower earlier?

A. 2006, 2010 & 2011

Possible explanation: The average daffodil flowering date was the same in 2011 and 2014, even though 2011 was sunnier. This may be because temperatures were very low in 2011 and quite high in 2014. 2010 saw lower than average temperatures and the lowest temperatures of our study for January and February. 2006 saw the highest hours of sunshine and rainfall in November, and lower than average hours of sunshine in February and March.

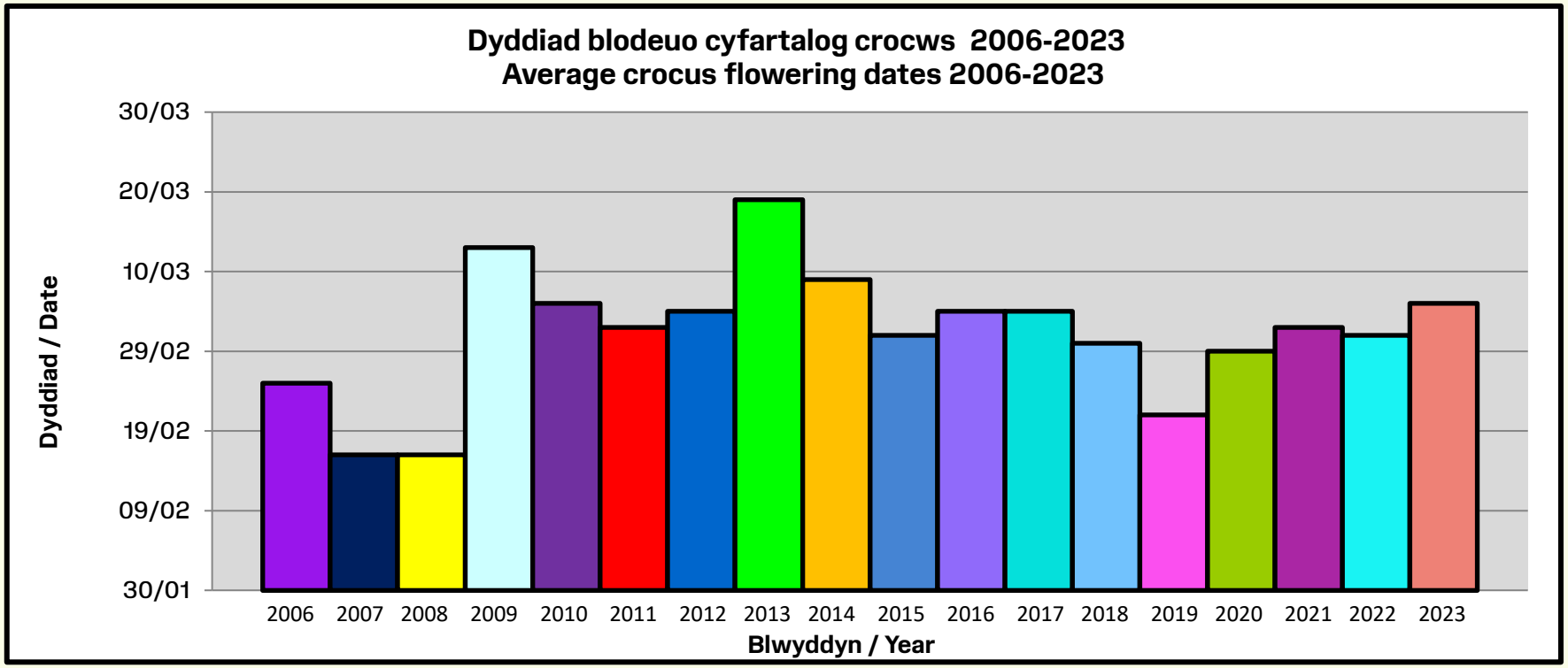


Q: What years would we have expected to flower later?

A. 2017, 2019, 2020 & 2021

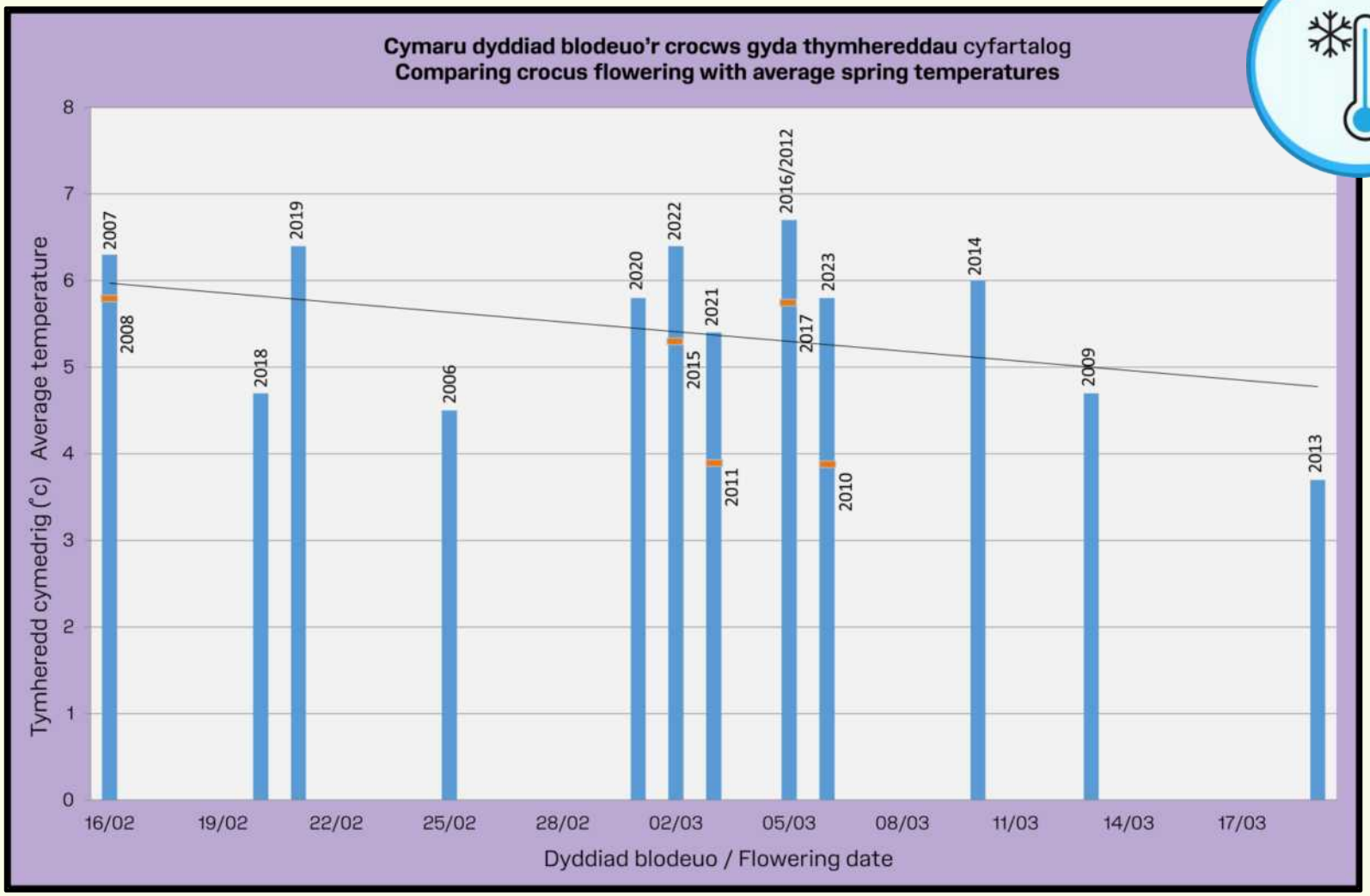
Possible explanation: We might have expected daffodils to flower later in these years due to low hours of sunshine. Plants may have flowered earlier than we'd have expected in these years because they saw higher than average temperatures for this period. 2019 also had above average hours of sunshine for February and 2020 had above average hours of sunshine for March.

How does the weather effect flowering dates for the crocus?



The bar chart shows that 2023 saw the joint fourth latest flowering date for the crocus. Can you see which year crocus plants flowered latest?

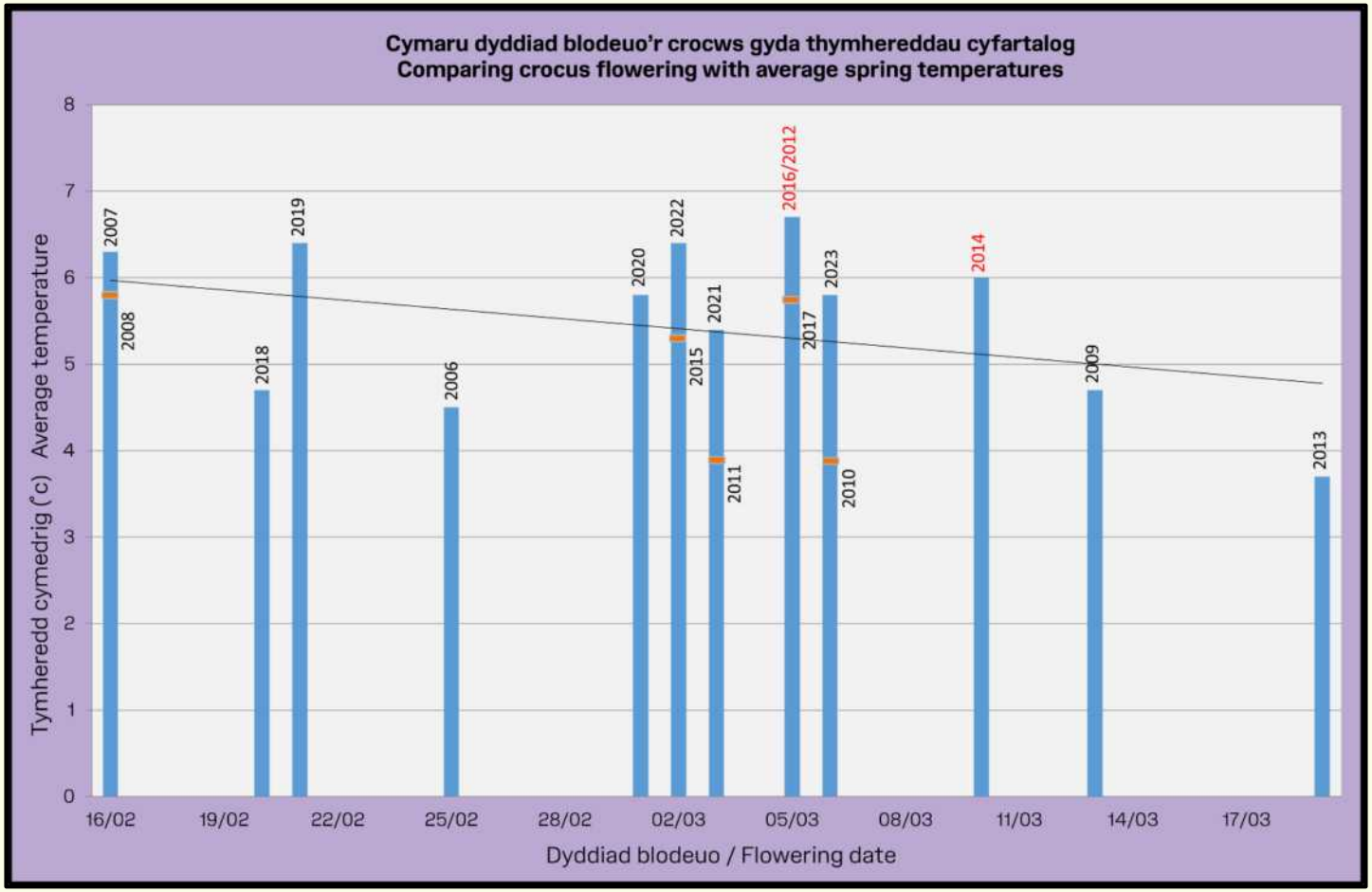
Click here to see if you are right!



The trend shows that crocus flowers open later when temperatures are lower. There are some exceptions, can you spot them?

Q: What years would we have expected to flower earlier?

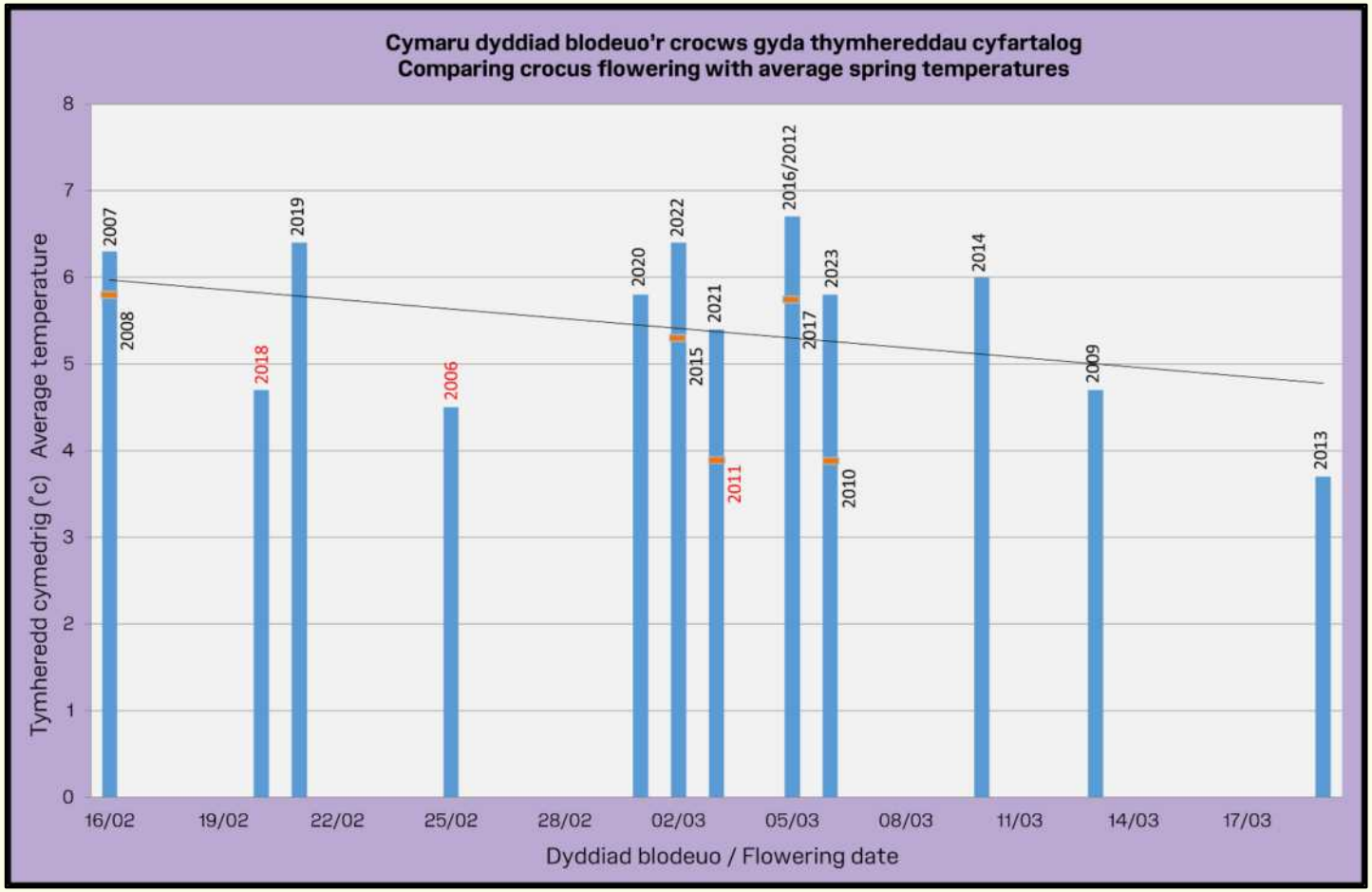
A: 2012, 2014 & 2016



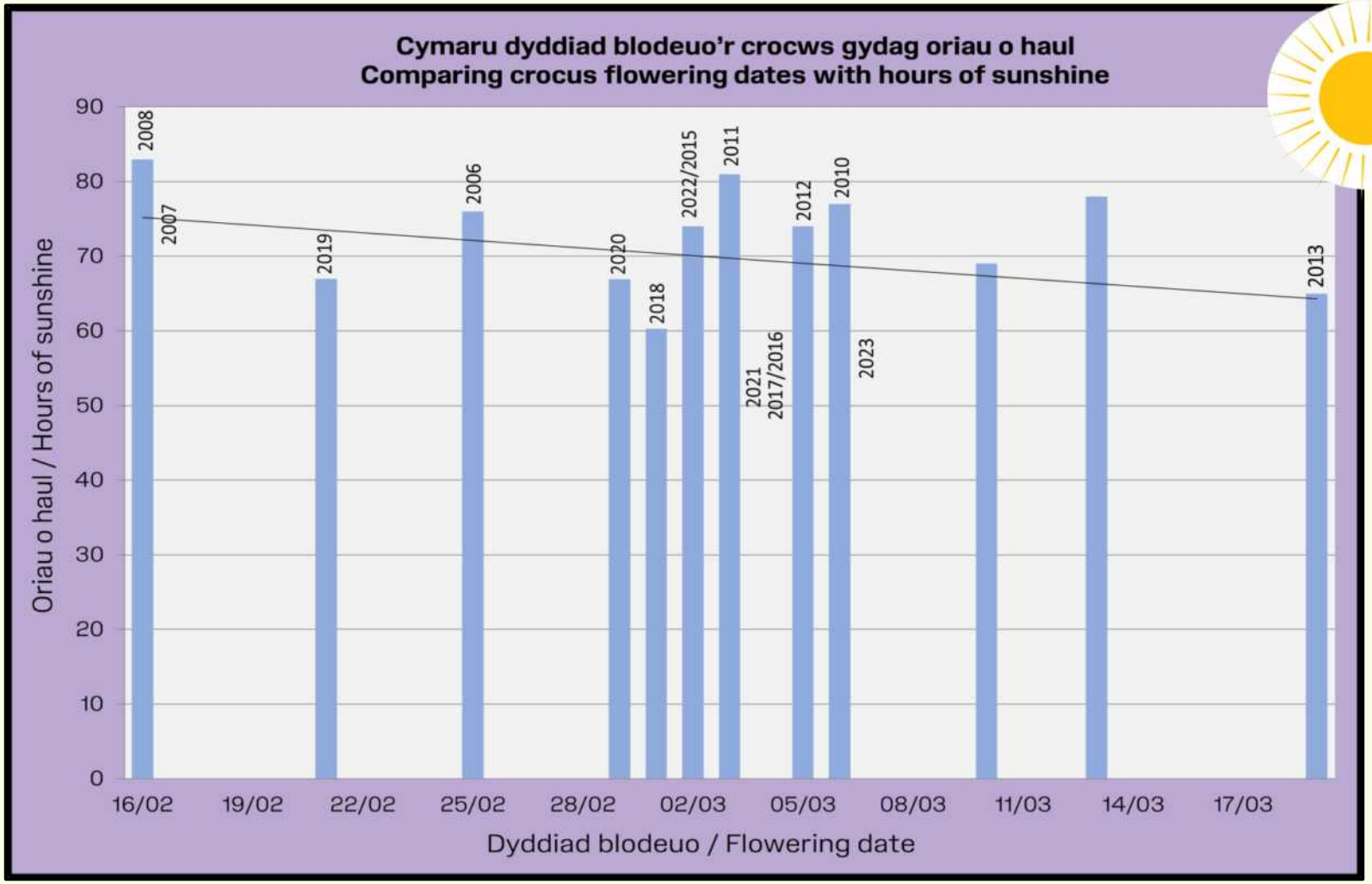
Possible explanation: We would have expected plants to flower earlier in 2012, 2014 & 2016. By looking at our other graphs we can see that 2011 and 2016 saw a sharp decrease in temperature in February. In 2014 and 2016 it's possible that high levels of rainfall effected the flowering dates of plants.

Q: What years would we have expected to flower later?

A: 2006, 2011 & 2018



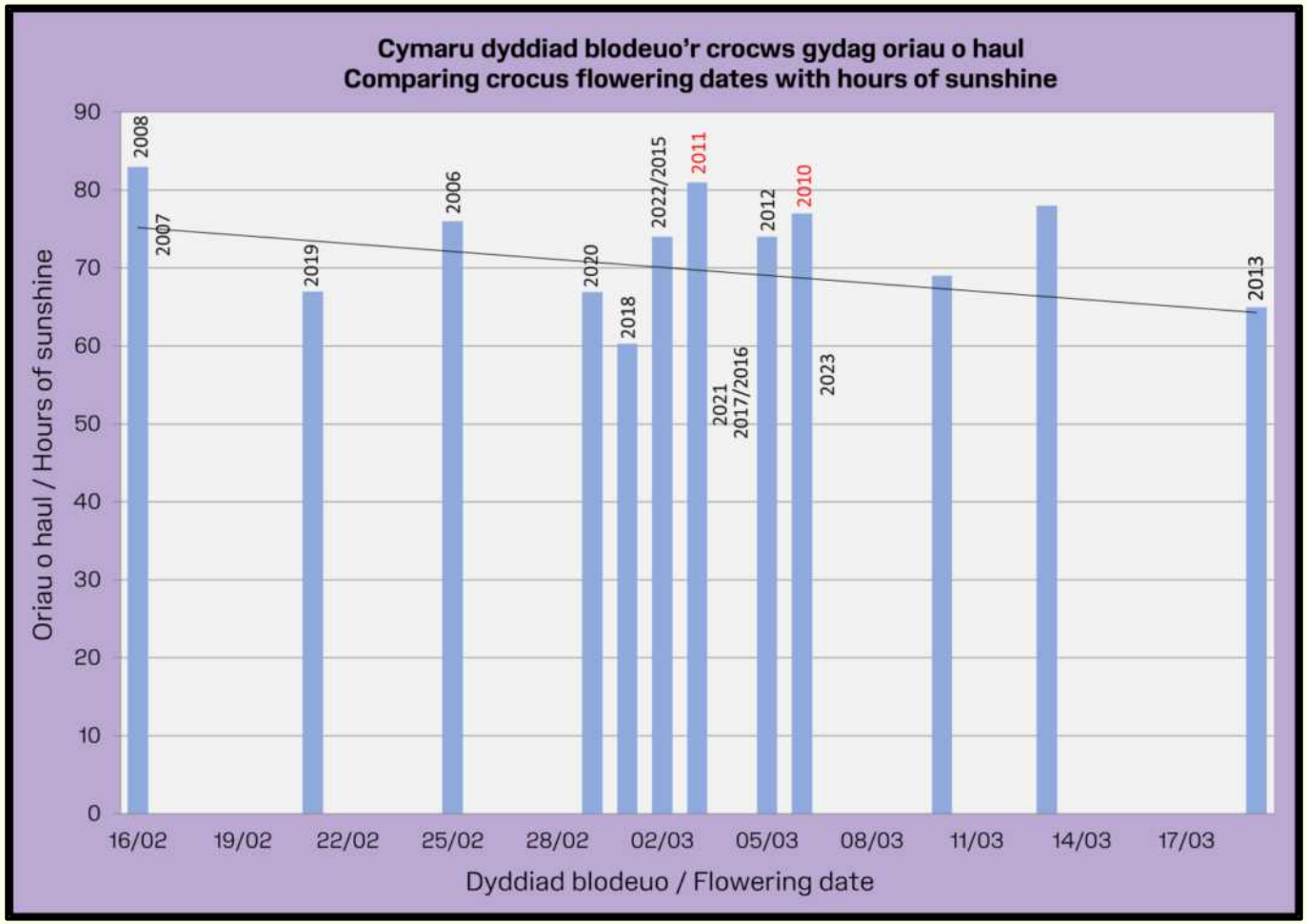
Possible explanation: Crocus flowers opened earlier than we'd have expected in 2006, 2011 & 2018. 2006 saw average temperatures and hours of sunshine, but lower than average rainfall. 2018 saw a sharp increase in hours of sunshine in February and 2011 saw a sharp increase in temperature in February.



The trend shows that crocus flowers open later when there is less sunshine. There are some exceptions, can you spot them?

Q: What years would we have expected to flower earlier?

A. 2009, 2010 & 2011

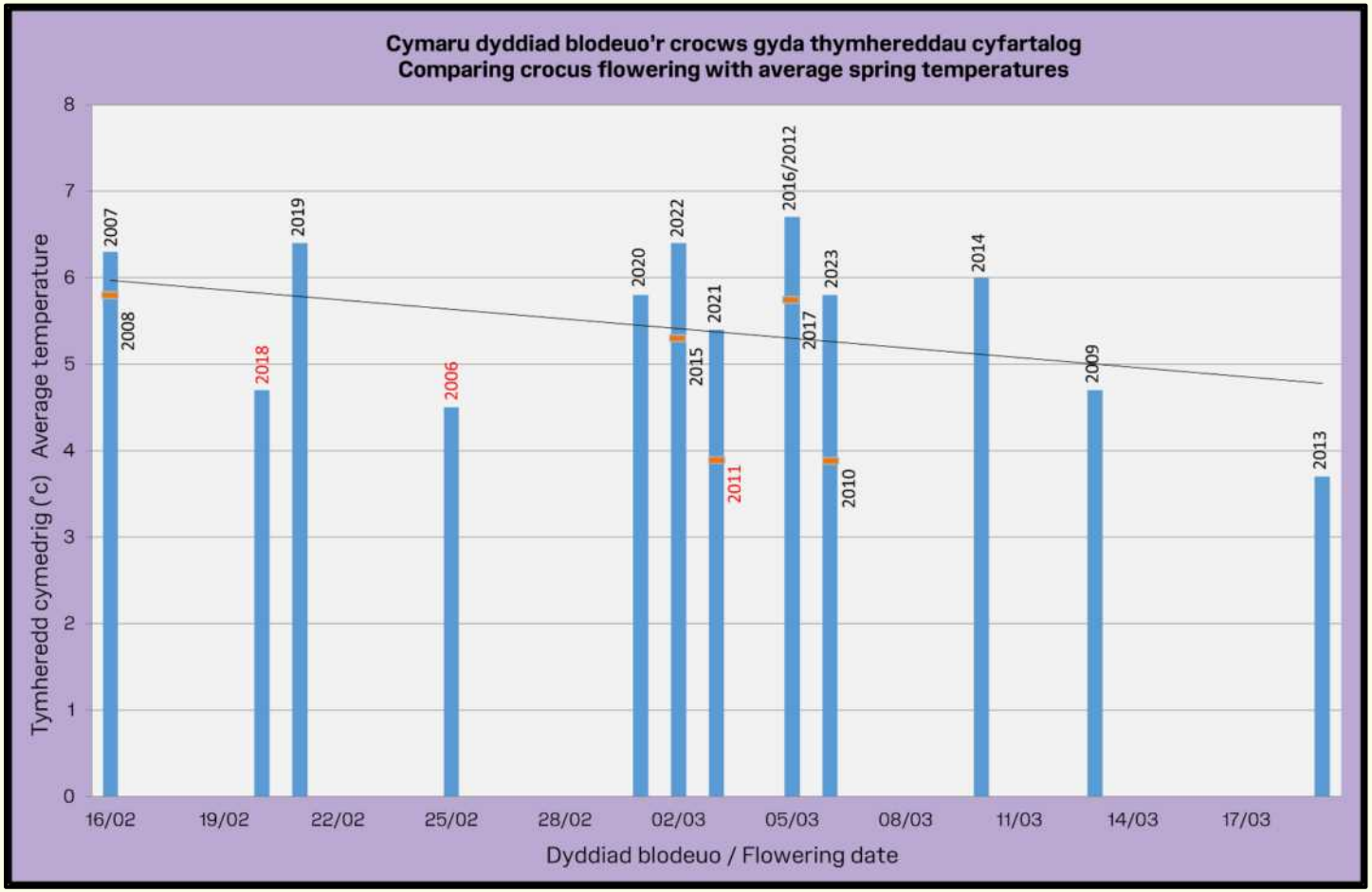


Possible explanation: There were high hours of sunshine but low temperatures in 2011 and 2010. Although 2009 had high temperatures and hours of sunshine overall, it had low hours of sunshine during February.

These results show that although overall averages help us to spot trends and analyse data, they can oversimplify the results. Sometimes we need to fill in the gaps by looking at more detailed tables.

Q: What years would we have expected to flower later?

A: 2018, 2019 & 2021



Possible explanation: Crocus flowered earlier than we would have expected in these years based on the average hours of sunshine. Our previous tables show that 2019 and 2021 saw higher than average temperatures while 2018 saw higher than average temperatures for January and higher than average hours of sunshine for February.

What do these graphs tell us about flowering dates?

- By comparing the trends for temperature and hours of sunshine we can see that both are necessary for our plants to flower.
- 2023 saw average temperatures and below average hours of sunshine for this period. 2023 saw crocus and daffodil plants flower later than the average.
- It's important to look at monthly overviews for temperature, hours of sunshine and rainfall. These can often explain anomalies in our results.

Finding a trend can be difficult, but some things are clear...

- Bulbs rely on both sunshine and warmth to flower.

- The seasons are becoming more unpredictable as the planet warms.

Download the results yourself to...

- Make graphs and frequency charts to calculate the mean.
- See if flowers opened later in schools that recorded colder weather.
- See how temperature, sunshine and rainfall affect average flowering dates.
- Look for trends between different locations.

Visit: https://museum.wales/spring-bulbs/

Digital Resources

Visit the Spring Bulbs for Schools website and The Edina Trust website for an array of teaching resources relating to the project.

Amgueddfa Cymru - National Museum Wales have digital resources that relate to collections across their seven Museums. Schools in Wales can also access resources on the Hwb website.

The above pages all have links to our Kahoot quizzes!

Kahoot!