Hop report

January–April 2021 (Saaz region)

1. Weather condition in 1st trimester 2021

Long term average of the air temperatures and precipitation amount in the period of 1981–2010 as measured on the meteorological station Žatec

Temperature (°C)	2021	2020	30 years average	Diff. 20-21
January	0,53	1,6	-0,7	-1,07
February	-1,36	5,4	0,4	-6,76
March	4,65	5,3	4,3	-0,65
Summary 1st trimester	**3,82**	**12,3**	**4,0**	**-8,48**

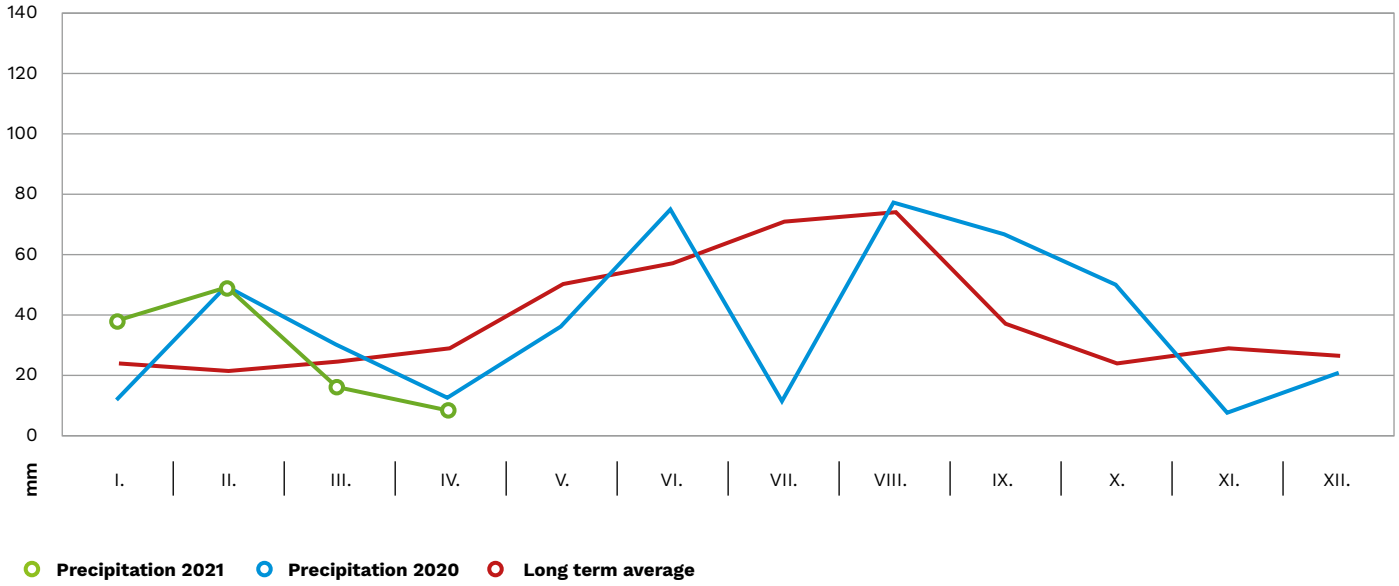
Precipitation (mm)	2021	2020	30 years average	Diff. 20-21
January	39,6	8,2	21,5	+31,4
February	45,4	45,4	20,0	+1,0
March	18,2	31,8	25,9	-13,6
Summary 1st trimester	**102,2**	**85,4**	**67,4**	**+16,8**

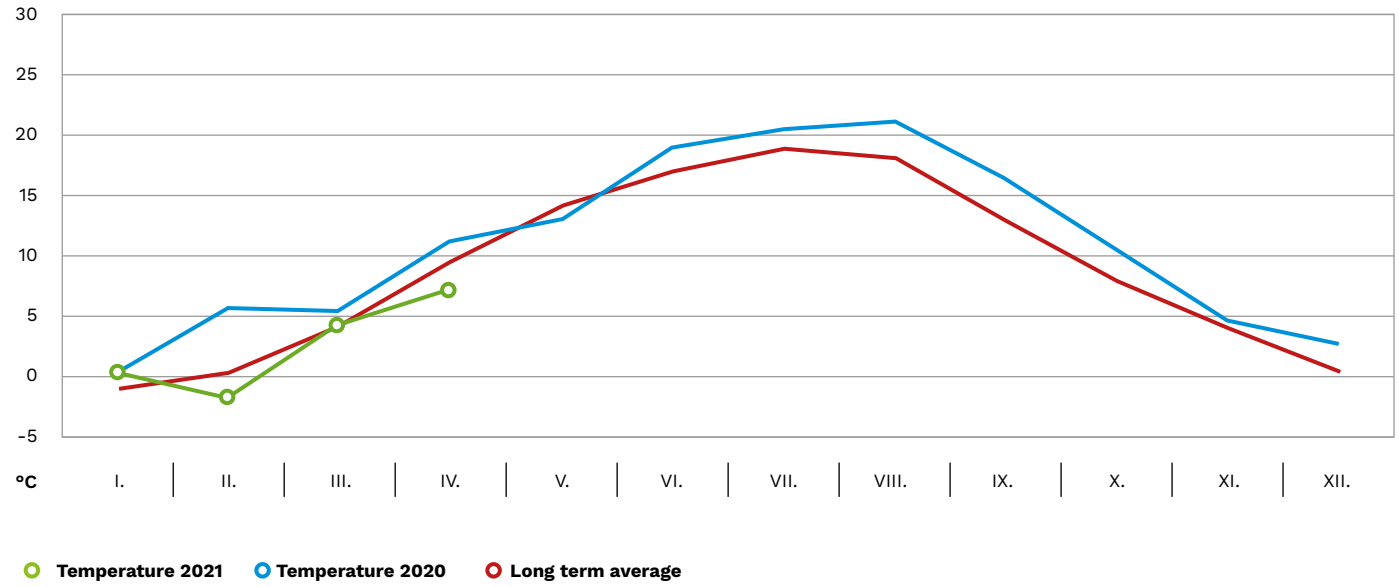
The weather during the first trimester of 2021 was colder than in the same period of 2020, as far as the average temperatures are concerned. In comparison to the values of the long-term average the oscillation of the temperatures in individual months was minimal. The coldest months of the first trimester of 2021 was February. This situation was caused by very low average daily temperatures during the period between February 7 and February 16, 2021, when it never increased above the freezing point. Precipitation during the first trimester 2021 were above the level of the long-term average as well as above the year 2020. Considerable exceeding of the precipitation was recorded in January and February, when it reached 184% and 222% of the long-term average, respectively. In the middle of the first decade of February, after a few years, about 20 cm of the snow fell in the Saaz region and it lasted thanks to the cold weather until February 16, 2020.

The nature of the weather enabled a normal start of the field works in most areas. The situation was similar in hop gardens. In some areas the beginning of the spring works was limited by higher winter precipitation, as these areas were waterlogged. It reflected also in the problems with the construction of new hop gardens. Spring works in hop gardens began in March, when the hauling of hop gardens took place. At the end of March the hop growers started cutting hops in hybrid varieties.

2. Weather condition in April 2021

Temperature & precipitation in April	2021	2020	30 years average
Average temperature (°C)	7,17	10,7	9,1
Precipitation (mm)	6,8	12,8	30,7
Total precipitation (mm) since 1st January	109	98,2	98,1
Max. temperature (°C)	23,77	26,2 (16 4.)	
Min. temperature (°C)	-4,6	-7,5 (1. 4.)	
Max. precipitation (mm)	2,4	12,0 (19. 4.)	
Number of dry days	23	27	





This year´s April was below average in temperature. Fifteen days recorded a minimum daily temperature below freezing point. Moreover, the feeling of the temperature was lowered by fresh wind, which also significantly drained the soil. In terms of precipitation we consider this April as catastrophic. It rained only 6, 80 mm of precipitation, what represents 22% of the long-term average.

3. Spring works and growth report

The nature of the weather enabled the growers to carry out spring works in hop gardens at the usual time. Weather without precipitation then allowed the growers to cut hops in a usual time. The hop growers could then regulate the time cut of hops according to their needs. The pruning of hops was smoothly followed by the stringing of training wires and their embedding. Works on hop gardens were predominantly carried by the foreign workers. However, cold weather negatively affected the growth of hops. The hop plants did not grow due to very low temperatures. The time difference in hops pruning has therefore disappeared and it is assumed that the hops will grow all at once, independently of the date of the cut. It will increase the demand on the number of temporary workers. According to the state of vegetation the training of hops is estimated between May 10 and May 15, 2021.

4. Health condition of hops

Due to the climatic conditions when the hops did not grow as usual, some gardens were treated only against alfalfa snout weevil (Otiorhynchus ligustrici L.), which has been found out on the hop gardens despite the low temperatures. Self-monitoring of this pest was recommended, according to individual position of the gardens. The growers have applied the spraying by Actara 25 WG, which was authorized by the Central Institute for Supervising and Testing in Agriculture (ÚKZÚZ) for plant protection for limited and controlled use within the period between March 26 and July 20, 2021.

4. Photodocumentation

hop garden view 30. 4. 2021

hop garden view 30. 4. 2020

hop row view 30. 4. 2021

hop row view 30. 4. 2020

Saaz, May 3, 2021, Ing. Jaroslav Hájek

Hop report

May 2021 (Saaz region)

1. Weather condition in May 2021

Temperature & precipitation	2021	2020	30 years average
Average temperature (°C)	12,13	12,94	14,2
Precipitation (mm)	97,4	37,4	52,0
Total precipitation (mm) since 1st January	206,4	135,6	150,1
Max. temperature (°C)	29,36 (10. 5.)	27,3 (8. 5.)	
Min. temperature (°C)	1,13 (8. 5.)	-0,5 (12. 5.)	
Max. precipitation (mm)	20,8 (13. 5.)	12,0 (11. 5.)	
Number of dry days	11	19	

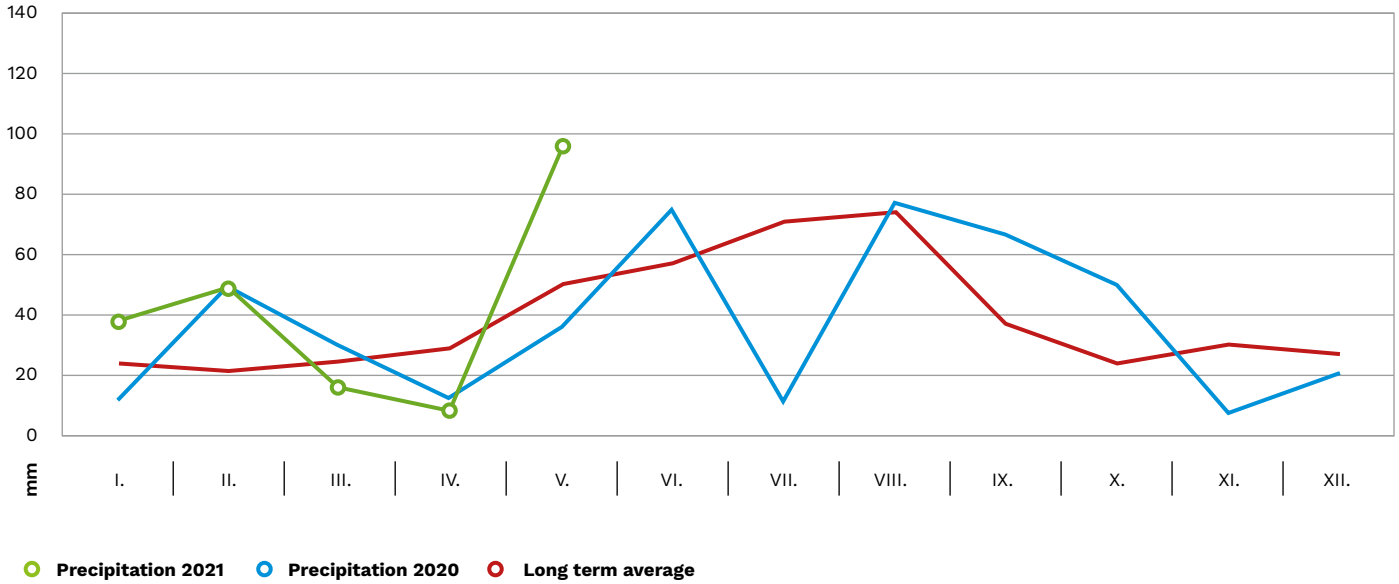
May 2021, as far as the temperature is concerned, was the coldest May in previous 30 years. The average temperature was even lower than in the same month of previous year and in comparison to the long term average the difference reached -2,07 °C.
The coldest period of May was the beginning of the month, until May 8th, 2021, but more expressive and longer warming did not come. The average daytime temperatures varied all the time around 12 °C.
For this reason the average temperature in May varied below the long term normal. In terms of precipitation, this May was very good compared to last year and reached about 187,3 % of the long-term average. Water regime of this year we consider very good.

2. Growth report

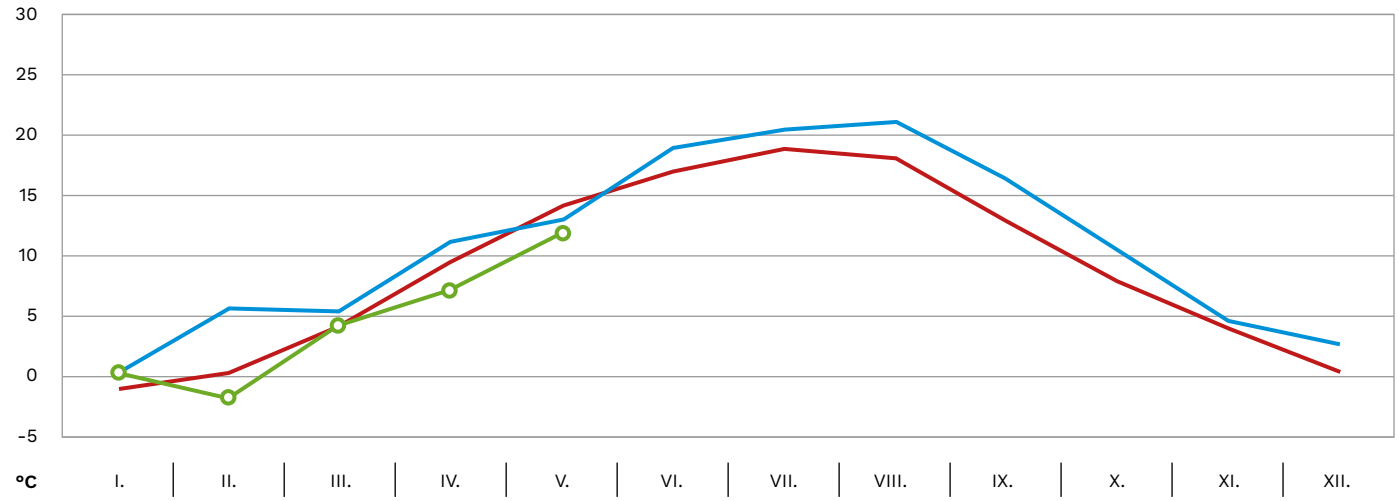
Very cold weather prevailing practically throughout May negatively affected the growth of hops. Due to very slow development of the plants at the beginning of May the growers had to postpone the training of the hops several times. The time of the training of the hops has thus been postponed to May 15, what only few growers remember. The training of hops therefore took place continuously according to the condition of the plants on individual hop gardens. In terms of plants growth the areas where the late cut was done were the most affected. That is why it was not possible to train the hops of these areas until the end of May. The training of those hop plants will not take place until the first decade of June. This situation reflected in postponing of other works as fertilizing and hilling up the plants. Currently we estimate the delay of the works in hop gardens to be at least fifteen days in average.

3. Health state of hops

The initial nature of weather in May was not favourable for the development of downy mildew of hops (Pseudoperonospora humuli Miy et Takah.). However, it was recommended to carry out the protective intervention consisting in the early application of the preparation Aliette 80 WG. In hop gardens, where the incidence of spikes was higher every year, the intervention with the preparation Prolifer was recommended. The precipitation during May led to the increase of infectious pathogen´s pressure. It was recommended to carry out the second treatment by the preparation Aliette 80WG or by the preparation Curzate K. The nature of the May weather was the reason why the occurrence of the hop aphid (Phorodon humuli Schrank) was not observed on hops. It was therefore not necessary to carry out treatment against this pest. The cold weather was also adverse to the development of the red spider mite (Tetranychus urticae Koch) and significantly slowed down its population dynamics. A special chapter of this year was the issue of the occurrence of alfalfa snout weevil (Otiorrhynchus sulcatus F.) It was therefore recommended, from the beginning of May, it´s careful monitoring, and the treatment with the preparation Actara 25 WG on the areas where the threshold of economic harmfulness was exceeded. At the same time, this preparation also destroyed the spring generation of flea beetle (Psylliodes attenauta Koch).



Precipitation 2021 **Precipitation 2020** **Long term average**



Temperature 2021 **Temperature 2020** **Long term average**

4. Other information

The area of hop gardens in the Czech republic

Variety	Saaz region	Auscha region	Terschitz region	Czech republic
Saaz semi-early Red	3 301	415	483	4 199
Agnus	48	11	1	60
Bohemie	0	0	1	1
Harmonie	7	0	0	7
Kazbek	13	5	4	22
Premiant	124	39	54	217
Saaz Late	42	0	2	44
Saaz Special	41	0	0	41
Sládek	238	50	86	374
Vital	3	1	0	4
Others	18	0	0	18
Total	**3 835**	**521**	**631**	**4 987**

4. Photodocumentation

hop garden view 31. 5. 2021

hop row view 31. 5. 2021

early cut of hop plant

late cut of hop plant

Žatec, June 1, 2021
Jaroslav Hájek

Hop report

June 2021 (Saaz region)

1. Weather condition in June 2021

Temperature & precipitation	2021	2020	30 years average
Average temperature (°C)	20,3	18,5	17,0
Precipitation (mm)	64,6	73,6	59,1
Total precipitation (mm) since 1st January	271,0	209,2	209,2
Max. temperature (°C)	37,7 (19. 6.)	32,3 (27. 6.)	
Min. temperature (°C)	1,3 (1. 6.)	7,1 (2. 6.)	
Max. precipitation (mm)	20,6 (29. 6.)	13,6 (3. 5.)	
Number of dry days	18	11	

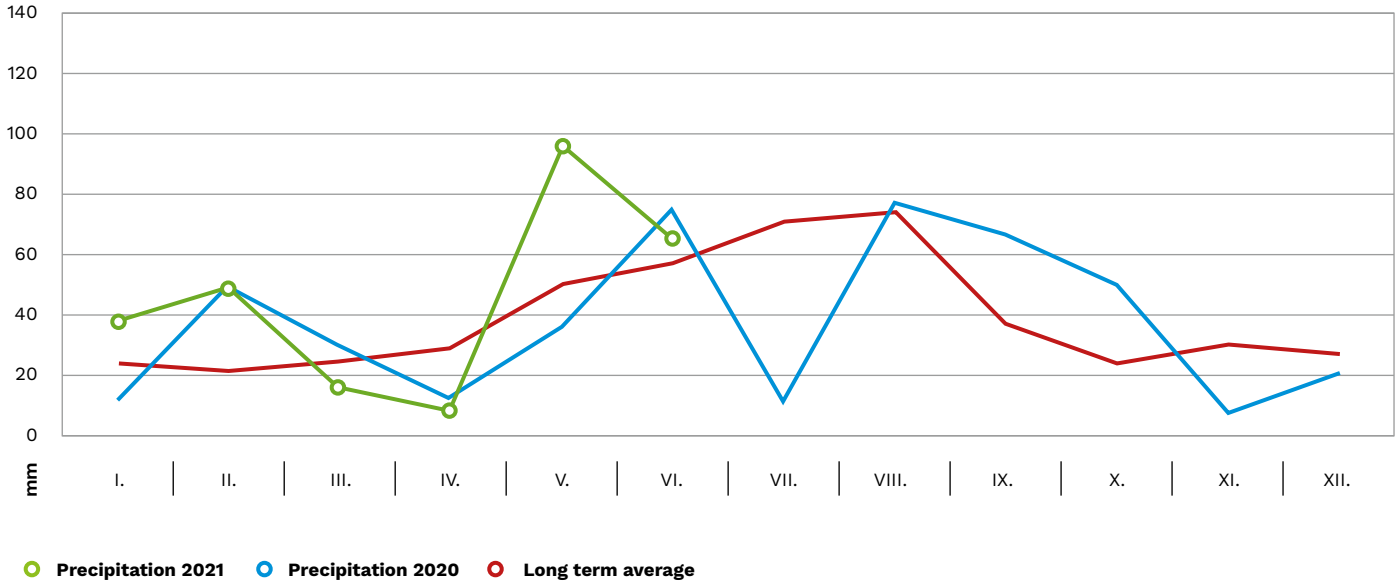
During the first two decades of June, dry weather prevailed for virtually the entire period. The situation changed dramatically in the third decade of the month, when there were places of abundant rainfall, which unfortunately in the Rakovnicko area resulted in a very heavy rain associated with hail on June 24, 2021 and June 29, 2021. In total, approximately 900 ha were damaged in the range of 10%-100%. We estimate the totally destroyed hop gardens on an area of approximately 200 ha. These were mainly the villages of Petrohrad, Hořovičky, Vrbice, Heřmanov, Zderaz, Kolešovice, Kněževes, Chrášťany, Kounov, Mutějovice, Pochválov, Kroučová and Mšec. The rainfall was of stormy nature and in some localities it rained up to 150 mm per month. Concerning temperatures the situation was quite favourable, except for the period from June 16, 2021 to June 21, 2021, when daily temperatures reached tropical values, which are not optimal for the development of hops.

2. Growth report

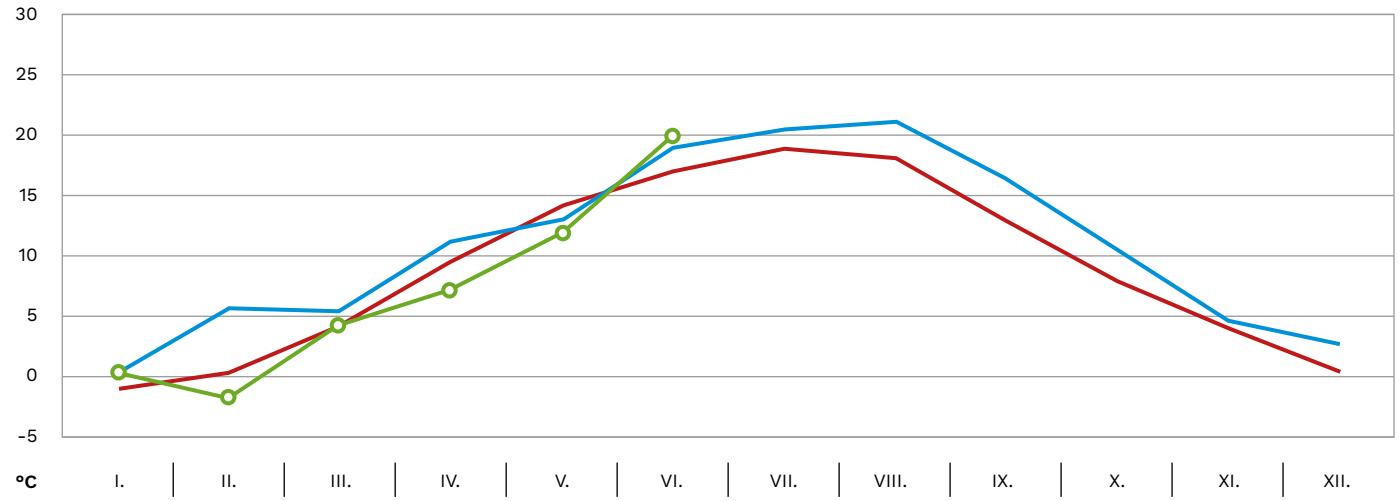
The growth and development of hops throughout the period of June was very good for hop gardens undamaged by hail. We estimate that about 80% of the stands have reached the height of the trellis. Given the current climatic conditions and the condition of the hops, we expect continued stretching growth also in July.

3. Health state of hops

Downy mildew of hops (Pseudoperonospora humuli Miy et Takah.) - although the conditions for the first treatment against downy mildew were not met, it was recommended to carry out this treatment in the period from June 8, 2021, to June 15, 2021, due to the occurrence of spike-like shoots. The preparations Folpan Gold, Bellis, Orvego or Ortiva could be used. Further treatment was performed in the period from June 23, 2021, to June 30, 2021, mainly due to the abundant precipitation in the third decade and the incidence of secondary infection. The preparation Revus could also be used in this period in addition to the products already mentioned above. On hop gardens with a higher number of spike-like shoots, it was then recommended to carry out the spraying with the curative fungicide Curzate K.
Hop aphids (Phorodon humuli Schrank) - colder weather caused a significant delay in the overflight of hop aphids and its weak occurrence in early June. It was therefore not necessary to carry out treatment against this pest. It was recommended to carry out treatment against this pest with the product Movento100 SC only in the period from 28. 6. 2021 to 4. 7. 2021, which is also the optimal date in terms of distribution of the active substance through the conductive tissues of plants.
Red spider mites (Tetranychus urticae Koch) - the cold weather also affected the population dynamics of red spider mites. Thorough monitoring was performed and where a critical number was reached (5 individuals of mites per leaf), treatment with Nissorun 10 WP or possibly Ortus 5SC was performed. High temperatures in the second half of the month however instigated the population growth of red spider mites, whose occurrence was already evident in hops. The recommendations for treatment against hop aphids were then followed.



Precipitation 2021 **Precipitation 2020** **Long term average**



Temperature 2021 **Temperature 2020** **Long term average**

4. Photodocumentation

hop garden view 30. 6. 2021

hop row view 30. 6. 2021

demaged plants after the hailstorm

demaged plants after the hailstorm

Žatec, July 1st, 2021

Hop report

July 2021 (Saaz region)

1. Weather condition in July 2021

Temperature & precipitation	2021	2020	30 years average
Average temperature (°C)	19,9	20,1	19,0
Precipitation (mm)	123,2	12,6	69,4
Total precipitation (mm) since 1st January	394,2	221,8	278,6
Max. temperature (°C)	33,3 (6. 7.)	33,2 (28. 7.)	
Min. temperature (°C)	10,0 (21. 7.)	6,6 (13. 7.)	
Max. precipitation (mm)	59,0 (13. 7.)	4,6 (16. 7.)	
Number of dry days	15	23	

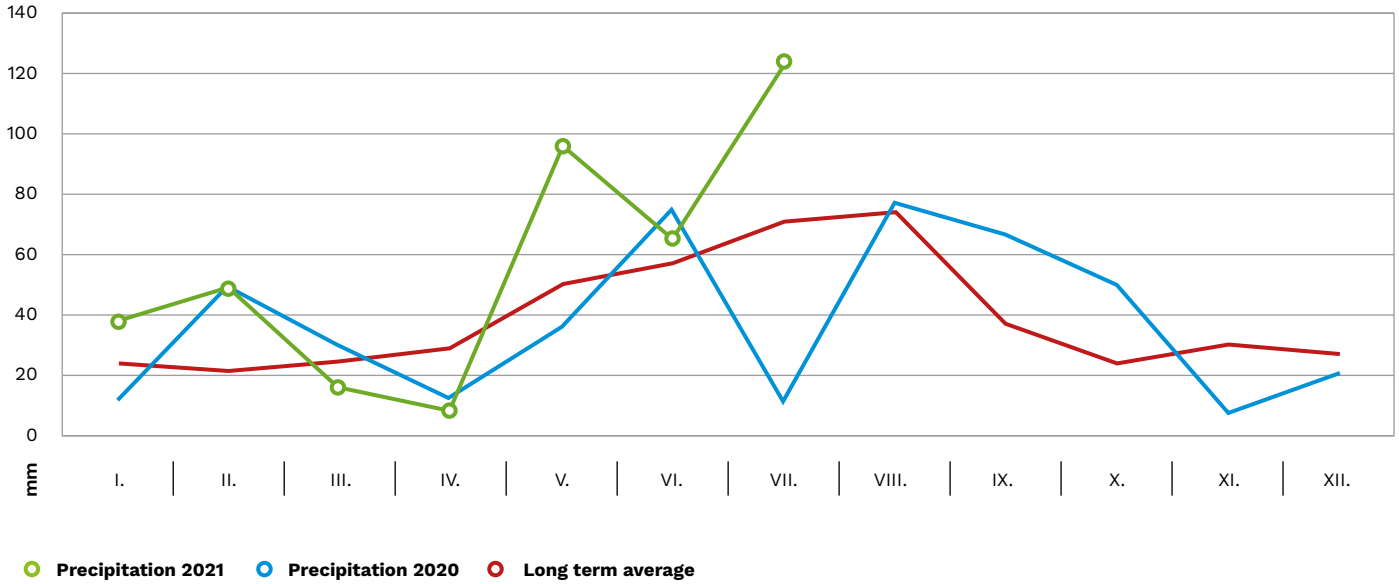
In terms of the development of climatic condition for hops the month of July was quite favourable. The average monthly temperature was practically equal to the long-term normal, without major daily fluctuations. The volume of precipitation was very good in the Žatec (Saaz) region, in July 2021 it reached 177.50 % of the long-term average. Due to high daily precipitation, one hectare of hop garden fell down on July 14, 2021, in the cadastre of the municipality of Postoloprty. Although the precipitation was of a stormy nature with differences in amount, it rained more than the long-term average in all areas.

2. Growth report

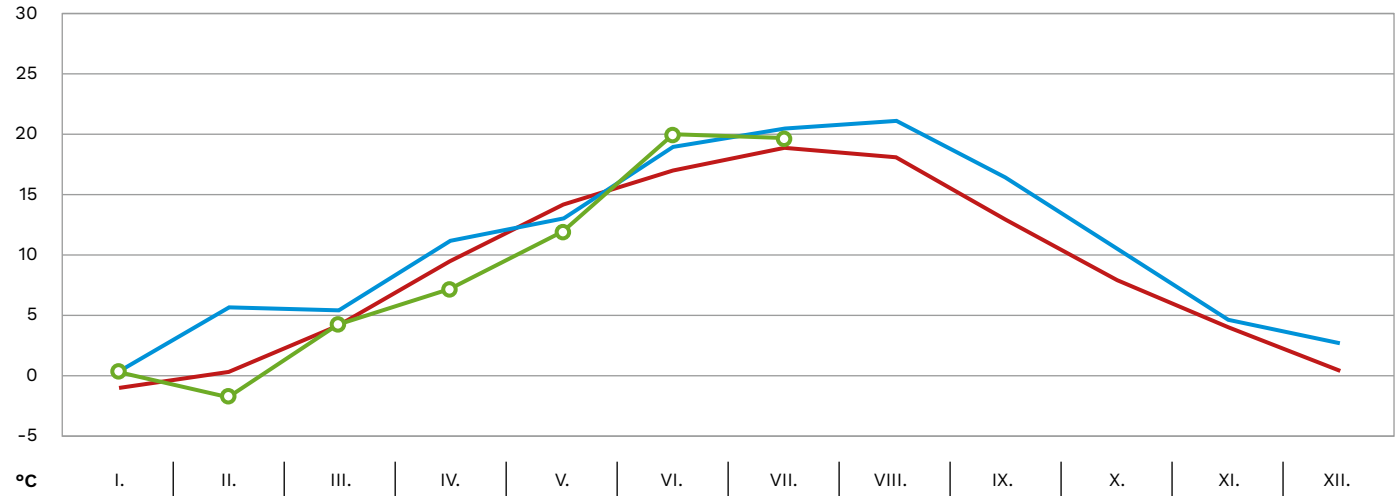
Our assumption that the elongation growth phase will continue has been confirmed. The elongation growth continued until the end of the second decade, and on some younger hop gardens, which were cut later until the end of the month. The habitus of the plants is very nice this year, on some hop gardens even very powerful. Following the above described development of hops, the hop plants began to bloom this year, similarly to previous year, up to the end of the second decade of the month. The start of the flowering is relatively good. The negative is the high positioning of flowers. The creation of the hop cones is still in its beginning and it varies according to hop variety, age of hop gardens and cutting date.

3. Health state of hops

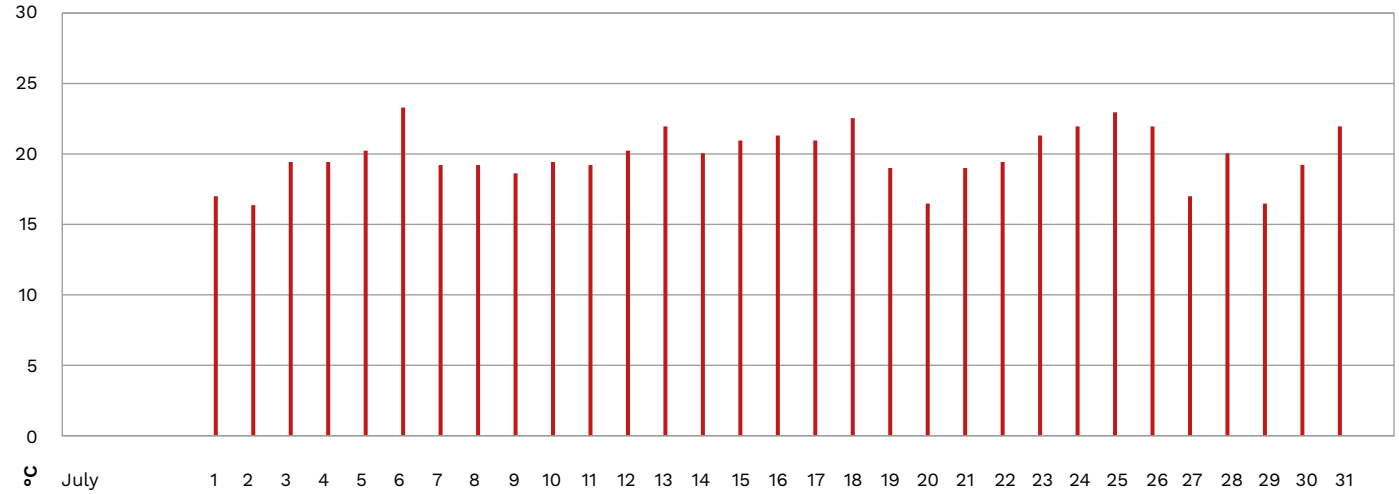
The intensive pressure of downy mildew of hops (Pseudoperonospora humuli Miy et Takah.) continued also in July. With regard to the high infectious pressure, the current nature of the weather and the transition of hops to the generative phase, the fourth and the fifth protective intervention against downy mildew of hops were performed. The preparations Ortiva, Bellis, Revus or Folpan Gold were applied. Animal pests, both hop aphids (Phorodon humuli Schrank) and red spider mites (Tetranychus urticae Koch), were eliminated with the preparation Movento 100 SC. It was also recommended to monitor the symptoms of hop powdery mildew (Sphaeroteca humuli (DC) Burr.). The preparations Bellis, Ortiva and Vivando are available against this disease.



Precipitation 2021 **Precipitation 2020** **Long term average**



Temperature 2021 **Temperature 2020** **Long term average**



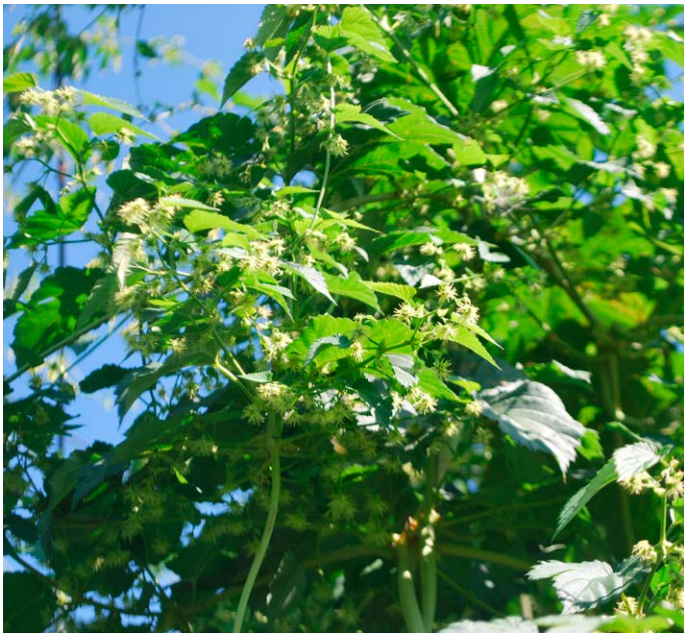
Daily temperatures in July

4. Photodocumentation

hop garden view 30. 7. 2021

hop row view 30. 7. 2021

Cone growth



Hop blossom

Žatec, August 2nd, 2021

Hop report

August 2021 (Saaz region)

1. Weather condition in August 2021

Temperature & precipitation	2021	2020	30 years average
Average temperature (°C)	17,5	21,2	18,3
Precipitation (mm)	56,6	78,4	70,8
Total precipitation (mm) since 1st January	450,8	300,2	349,4
Max. temperature (°C)	33,7 (13. 8.)	36,6 (21. 8.)	
Min. temperature (°C)	6,3 (25. 8.)	7,6 (28. 8.)	
Max. precipitation (mm)	12,2 (1. 8.)	22,8 (30. 8.)	
Number of dry days	13	18	

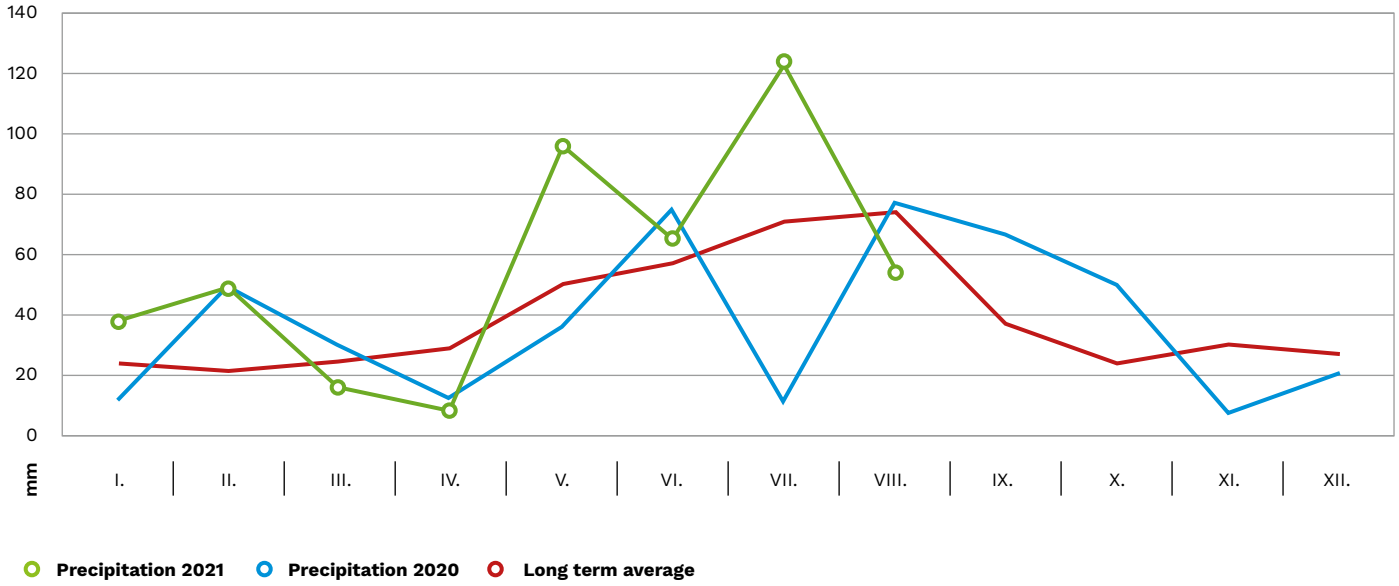
In August 2021 the precipitations fell practically at the end of the first decade and then during the third decade of the month. The rains at the end of the month were predominantly of the stormy character and so they are different in different localities. They caused worries to growers during the harvest. The average monthly temperature in August was below the long-term average by 0,83 °C.

2. Growth report

The condition of hops in terms of habitus was very good. The deployment of flowers was very nice, however in some hop gardens the cone development did not reach the expected state and the cones remained small. The harvest started by individual growers in the time horizon from August 16, 2021 (the fallen hop gardens) to August 28, 2021. According to the assessment of the state of the hops the harvest is expected to be higher than in previous year. The first results of the laboratory tests of the content of alpha acids show slightly above-average values corresponding to the level of 2020. We therefore estimate a slightly above-average content of alpha bitter compounds in comparison with the average of previous five years, especially in the case of Saaz variety. For other varieties, we still do not have sufficient data for a quality estimation.

3. Health state of hops

The health state of hops was relatively good since the beginning of the hops growing in this year. Strong pressure of the downy mildew of hops (Pseudoperonospora humuli Myi et Takah.) nevertheless persisted. Now there is the question whether the growers will be able to maintain this state until the end of the harvest.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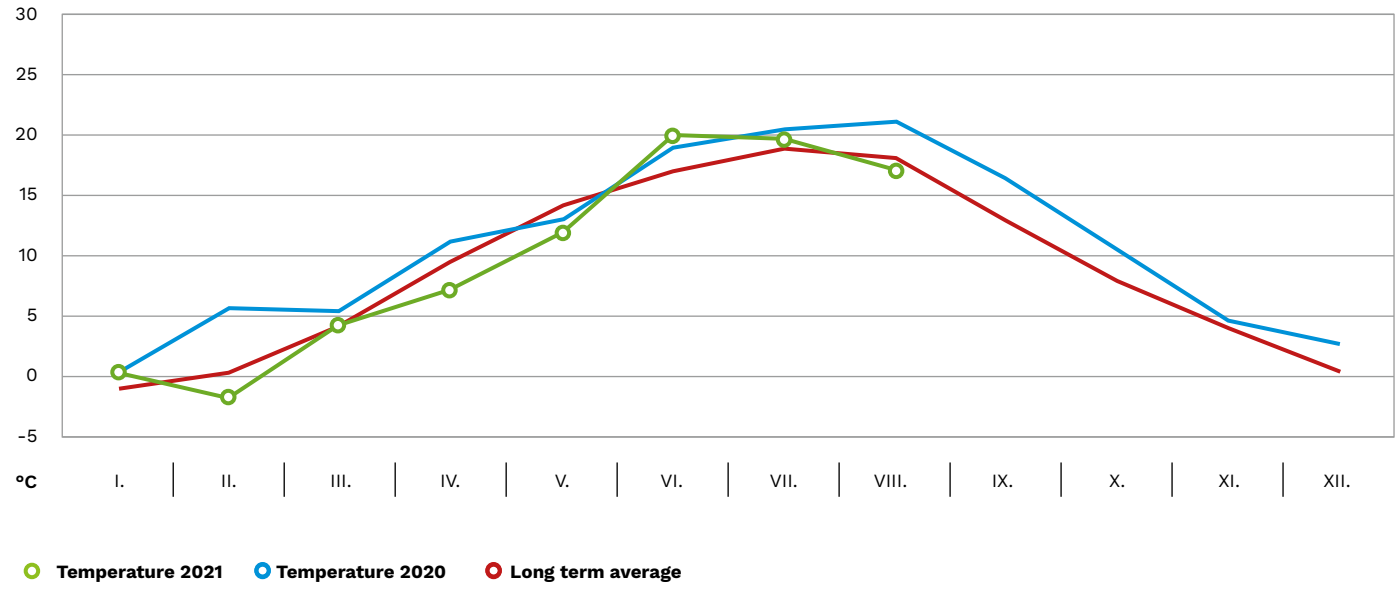
Precipitation 2021
Precipitation 2020
Long term average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Temperature 2021
Temperature 2020
Long term average

4. Further information

The ÚKZÚZ – Central Institute for Supervising and Testing in Agriculture in Saaz specified the hop gardens acreage to be harvested in 2021

The area of hop gardens to be harvested up to 20. 8. 2021 (ha)

Variety	Saaz	Auscha	Terschitz	Czech Republic
Saaz hops	3 299,8	410,4	473,5	4 183,6
Agnus	47,8	11,1	1,5	60,4
Blues	0,6	0	0	0,6
Bohemie	0,4	0	0,7	1
Boomerang	0,3	0	0	0,3
Country	0,8	0	0	0,8
Gaia	0,3	0	0	0,3
Hallertauer magnum.	2,4	0	0	2,4
Harmonie	6,8	0	0	0,4
Kazbek	13,6	4,8	3,9	22,2
Perle	1,4	0	0	1,4
Premiant	124,0	36,6	53,3	216,9
Rubin	1	0	0	1
Saaz Brilliant	0,8	0	0	0,8
Saaz Comfort	0,4	0	0	0,4
Saaz Late	42,4	0	1,7	44,1
Saaz Shine	0,8	0	0	0,8
Saaz Special	41,4	0	0	41,4
Sládek	237,5	50,3	86	373,8
Vital	3,1	0,8	0	3,9
Others	8,3	0	0	8,3
Total	**3 833,7**	**516,9**	**620,6**	**4 971,2**

5. Photodocumentation

Pressed hops

Hops to be picked

Hop joy

Žatec, September 2nd, 2021