Hop report - Saaz fine aroma hops

Crop 2015 – January / April (Saaz region)

WEATHER CONDITION – JANUARY / MARCH

Average temperature (°C)	2015	2014	30 years average	Diff. 15-14
January	2,6	0,5	-2,0	+2,1
February	0,8	1,9	-0,2	-1,1
March	5,2	6,4	3,6	-1,2
Summary 1st Trimester	8,6	8,8	1,4	+0,2

Total precipitation (mm)	2015	2014	30 years average	Diff. 15-14
January	13,6	18,4	20,0	-5,2
February	2,4	7,2	19,0	-6,0
March	32,2	12,2	23,0	+20,2
Summary 1st Trimester	48,2	37,8	62,0	+10,4

The way of weather development during the first trimester of 2015 was comparable to the weather in the same period of previous year. The average temperatures varied around the levels above zero. Especially in January the temperatures exceeded distinctively the limit of average temperatures.

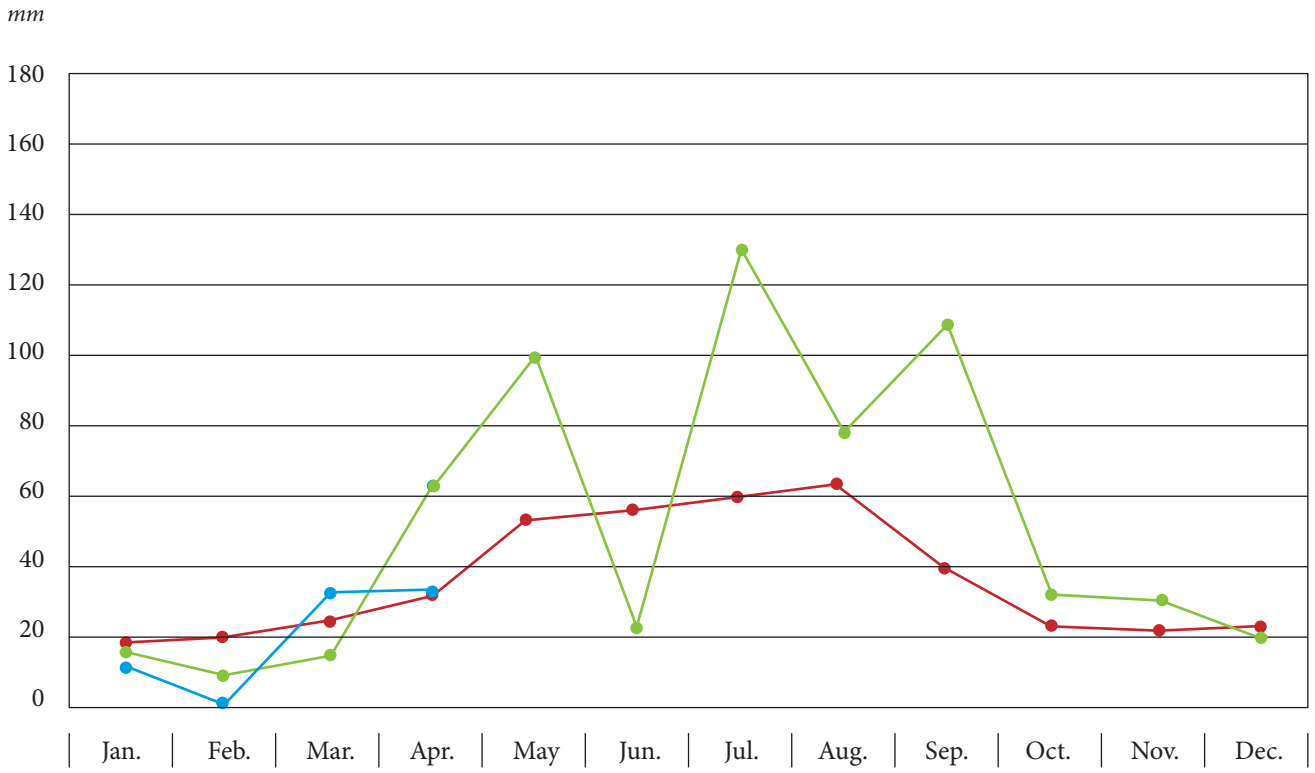
The precipitations in first quarter of 2015 were very poor. Low rainfalls in February (1,2 mm) caused almost catastrophic situation. Only thanks to the precipitations of autumn 2014, when the rainfalls from September to December reached 200, 5 mm, the situation was not worse. Similarly to the previous year, the whole winter period in lowlands was practically without snow.

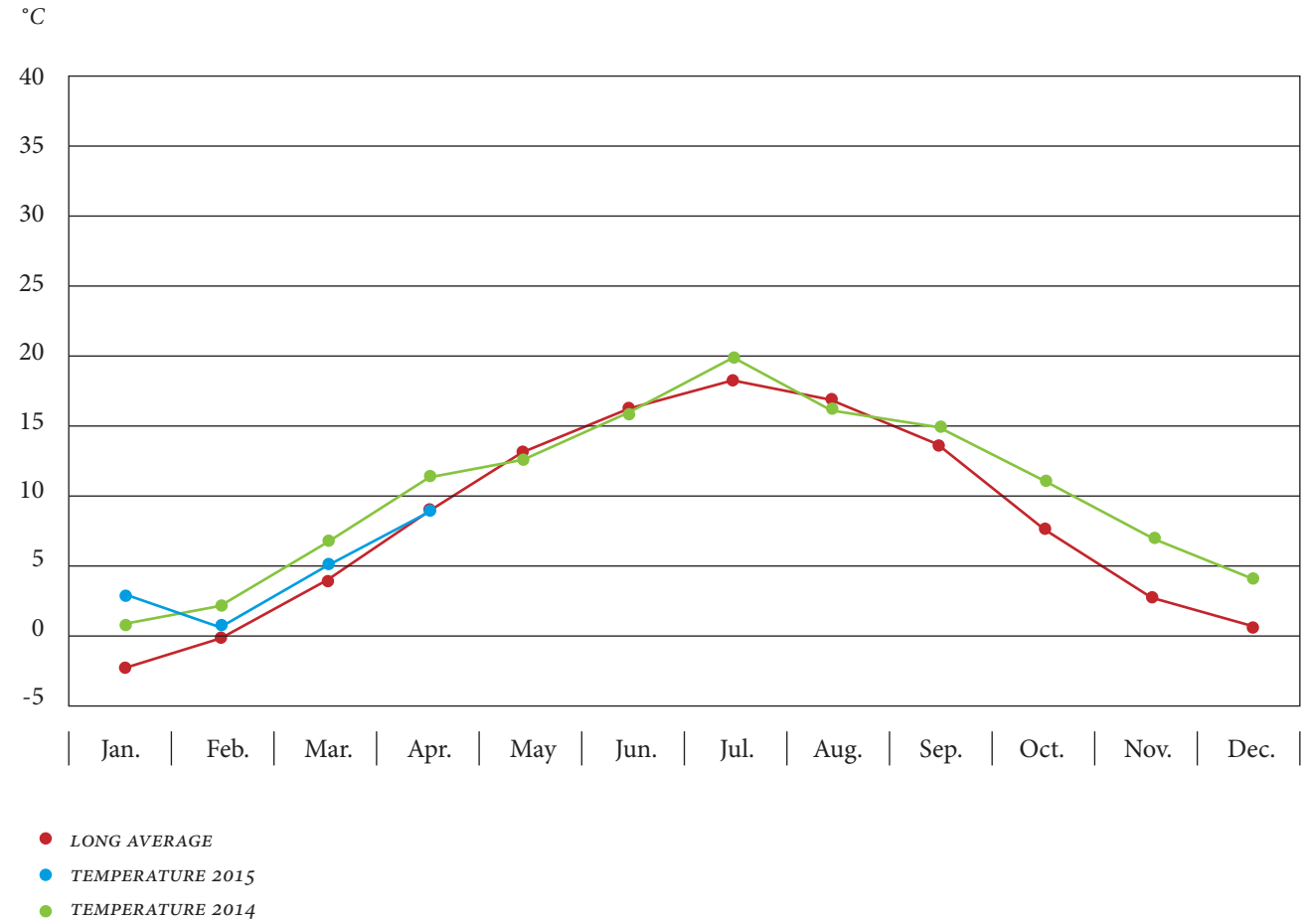
Just as in 2014, the weather development enabled early beginning of field works. The spring activities in hop gardens started already in the last decade of March. At the same time the growers embarked on the cut of hops, primarily the Sládek variety.

WEATHER CONDITION – APRIL

Temperature & precipitation in April	2015	2014	30 years average
Average temperature (°C)	8,7	10,9	8,5
Precipitation (mm)	34,0	61,6	32,0
Total precipitation (mm) January-June	82,2	99,4	94,0
Max. temperature (°C)	24,1 (15.4.)	23,3 (7.4.)	
Min. temperature (°C)	-3,9 (7.4.)	-4,2 (17.4.)	
Max. precipitation (mm)	12,8 (28.4.)	23,4 (28.4.)	
Number of dry days	18	17	

The climatic conditions in April were very favourable for spring works in hop gardens. Warm and dry weather allowed the farmers to carry out the basic operations in the gardens in quiet atmosphere and in the best quality. As far as the temperature is concerned, April weather was on the level of long-term average. The only negative was the shortage of the rainfalls, which varied on the level of 50% of the previous year precipitations. Above all, the lack of the moisture caused the problems during the sticking of the hop wires into the earth, as it was too hard. More abundant rainfalls came only by the end of the month, more specifically on 27th April and 28th April 2015. In some sites there were also some hailstorms, which nevertheless did not cause any losses. Together with the rains it also cooled down considerably.





SPRING WORKS AND GROWTH REPORT

As stated above, the spring works in hop gardens started in time. The development of the vegetation corresponded to the course of the weather. In some sites, especially those planted by Sládek variety, which were cut by the end of March, it was necessary to come to the training already towards the end of April. The time for training of Saaz hops is expected to begin between 7th and 10th May, 2015.

According to the monitoring of the occurrence of spring plant pests the presence of alfalfa snout weevil (Otiorrhynchus sulcatus F.) as well as flea beetle (Psylliodes attenauta K.) was find out. Based on the population density of these pests it was proceeded to the treatment of affected gardens with the preparations Actara 25 WG in dosage of 0,2 kg/ha, or alternatively with Karate Zeon 5 CS against flea beetle, in concentration of 0,06%.

It has been emphasized already for several years, that timely elimination of primarily infection is an indispensable condition for successful protection of hops against downy mildew of hops (Pseudoperonospora humuli Miy et Takah.). The preparation Aliette 80 WG was therefore applied in the dosage of 3,0kg. In the hop gardens, where the problems with downy mildew of hops repeat every year, the farmers use also alternative way of protection. It consists in employing of PK fertilizer Farm-Fos 44 (monobasic potassium phosphate with the content of 32% P2O5 and 29 % K2O), the use of which contributes to the increase of natural resistance of the plants against fungal pathogens.

PHOTO REPORT

Hop plant detail - 30. 4. 2015

Hop plants row - 30. 4. 2015

Hop garden view - 30. 4. 2015

Leaf surface damaged by Hop flea beetle - 30. 4. 2015

Saaz, May 1, 2015
Jaroslav Hájek

Chmelařstvi Cooperative Žatec

Hop report - Saaz fine aroma hops

Crop 2015 – May (Saaz region)

WEATHER CONDITION – MAY

Temperature & precipitation in May	2015	2014	30 years average
Average temperature (°C)	13,3	13,0	13,4
Precipitation (mm)	18,8	101,0	54,0
Total precipitation (mm) January-May	118,2	200,4	148,0
Max. temperature (°C)	23,3 (4.5.)	27,9 (22.5.)	
Min. temperature (°C)	1,8 (15.5.)	-1,0 (4.5.)	
Max. precipitation (mm)	5,4 (12.5.)	36,4 (27.5.)	
Number of dry days	17	12	

We consider the temperatures in May 2015 normal (the difference against long-term average was only 0, 1°C). In the course of previous month there were no expressive temperature extremes. Not even the temperatures below 0°C or particularly high temperatures approaching those of tropical level (30°C and more) were recorded. The precipitations were very low in May, similarly to the situation during previous months. Compared to the same period of 2014 approximately 80mm of the precipitations is missing and in comparison to the long-term average there is the lack of 30mm. In some localities the situation of agriculture crops is already critical, although hops, as deeply rooted plant, do not suffer by lack of water up to now. If nevertheless higher precipitations will not come within the first decade of June, the situation may turn critical in case of hops as well.

GROWTH REPORT

The weather conditions in May were relatively normal for the development of hops, except for the lack of rainfalls. The growth of hops was not very fast at all and so there were no problems with excessive growth of hops in the time of its training. The hop training therefore took place within given time limits. However, in some cases there appeared another problem, concretely lack of the temporary workers, what was caused by breach of contract for agreed labour force from the side of labour agencies. Newly planted hops grew up slowly also due to lack of moisture and that is why it was necessary to look them through and train them three times, at least. The fertilization was done on majority of gardens before the end of May and consequently the farmers carried out the hilling. The time of cut of the vines is still perceptible on the height of the plants. Overall we classify the state of hops as (very) good.

HEALTH STATE OF HOPS

The weather forecast signalized optimal conditions for dissemination of fungal diseases. It was recommended to carry out the second treatment by the preparation Aliette 80 WG. In the gardens where the ear-shape sprouts occurred in higher density it was necessary to treat the gardens by the curative fungicide Curzate K. The first individuals of winged aphis (*Phorodon humuli* Schrank) have appeared already during the second decade of May (13.05.2015), but the intensity of their occurrence was very weak and therefore it was not necessary to carry out the treatment against this pest. The occurrence of red spider mite (*Tetranychus urticae* Koch) was not recorded.

Hop area in the Czech republic according to varieties and regions up to 30th April 2015

Variety	Saaz region	Newly planted	Auscha region	Newly planted	Tirsitz region	Newly planted	Czech republic	Newly planted
Saaz var.	3 183	284	433	57	416	25	4 032	366
Agnus	35	1	3	0	0	0	38	1
Bohemie	1	0	0	0	1	0	2	0
Bor	1	0	0	0	0	0	1	0
Cascade	1	1	0	0	0	0	1	1
Hallertau	1	0	0	0	0	0	1	0
Harmonie	5	0	0	0	0	0	5	0
Kazbek	13	1	2	0	5	0	20	1
Other	11	1	0	0	0	0	11	1
Perle	1	0	0	0	0	0	1	0
Premiant	100	3	36	0	43	0	179	3
Rubin	1	0	0	0	0	0	1	0
Saaz Late	32	20	0	0	2	0	34	20
Saaz Special	20	9	0	0	0	0	20	9
Sládek	163	10	22	6	84	4	269	20
Vital	2	1	0	0	0	0	2	1
Total	**3 570**	**331**	**496**	**63**	**551**	**29**	**4 617**	**423**

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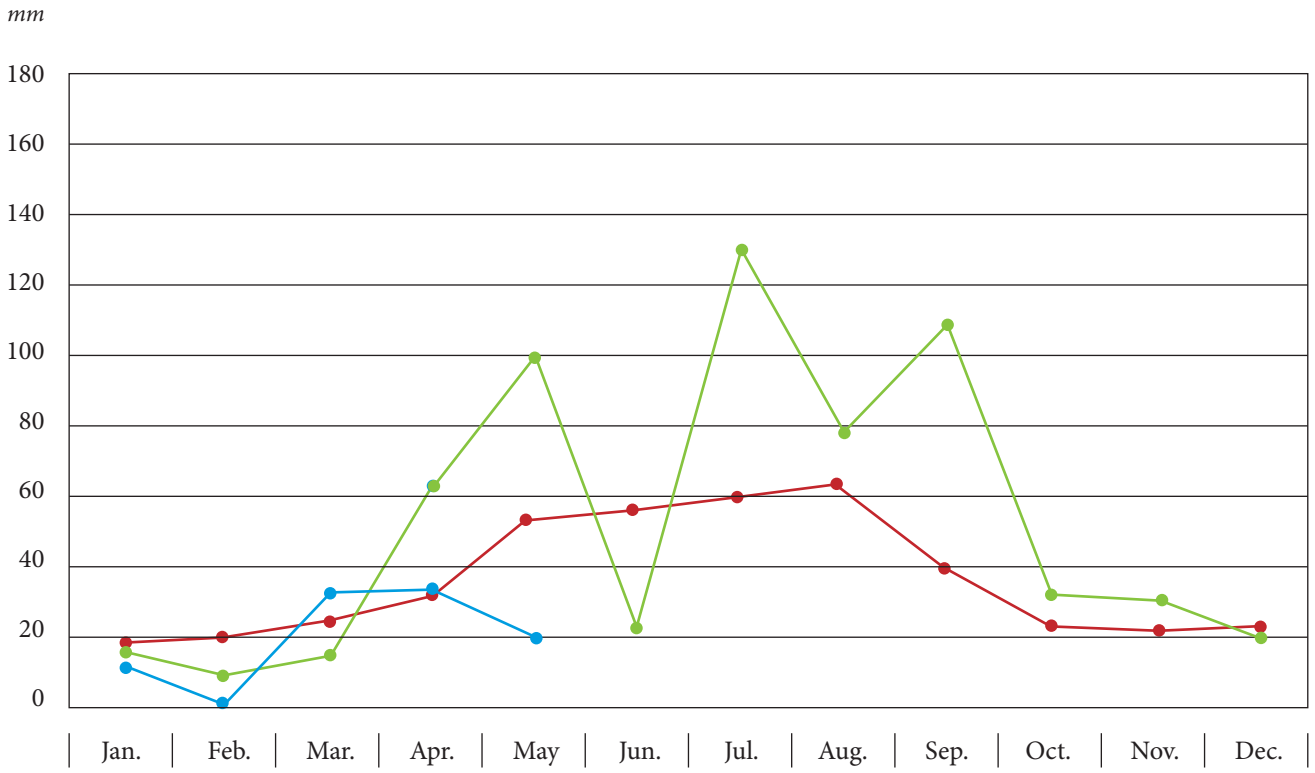


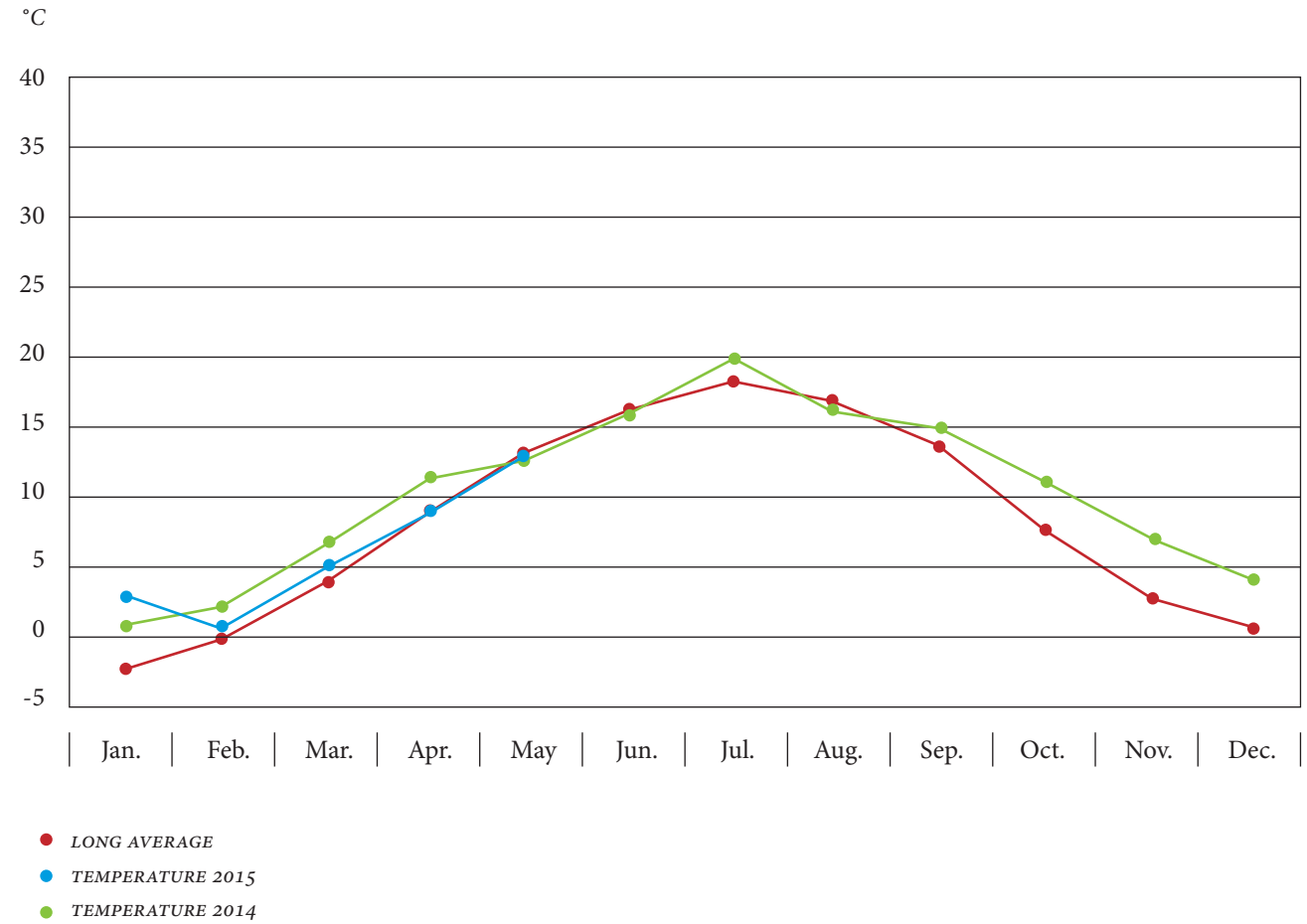


PHOTO REPORT

Row of hop plants

Detail view on top of the plant

Hop garden at the end of May

Saaz, June 1, 2015
Jaroslav Hájek

Chmelařstvi Cooperative Žatec

Hop report - Saaz fine aroma hops

Crop 2015 – June (Saaz region)

WEATHER CONDITION – JUNE

Temperature & precipitation in June	2015	2014	30 years average
Average temperature (°C)	16,4	16,6	16,7
Precipitation (mm)	85,4	23,6	56,0
Total precipitation (mm) January-June	203,6	224,0	204,0
Max. temperature (°C)	32,1 (6.6.)	32,1 (10.6.)	
Min. temperature (°C)	5,7 (25.6.)	4,6 (2.6.)	
Max. precipitation (mm)	23,6 (14.6.)	14,8 (25.6.)	
Number of dry days	16	22	

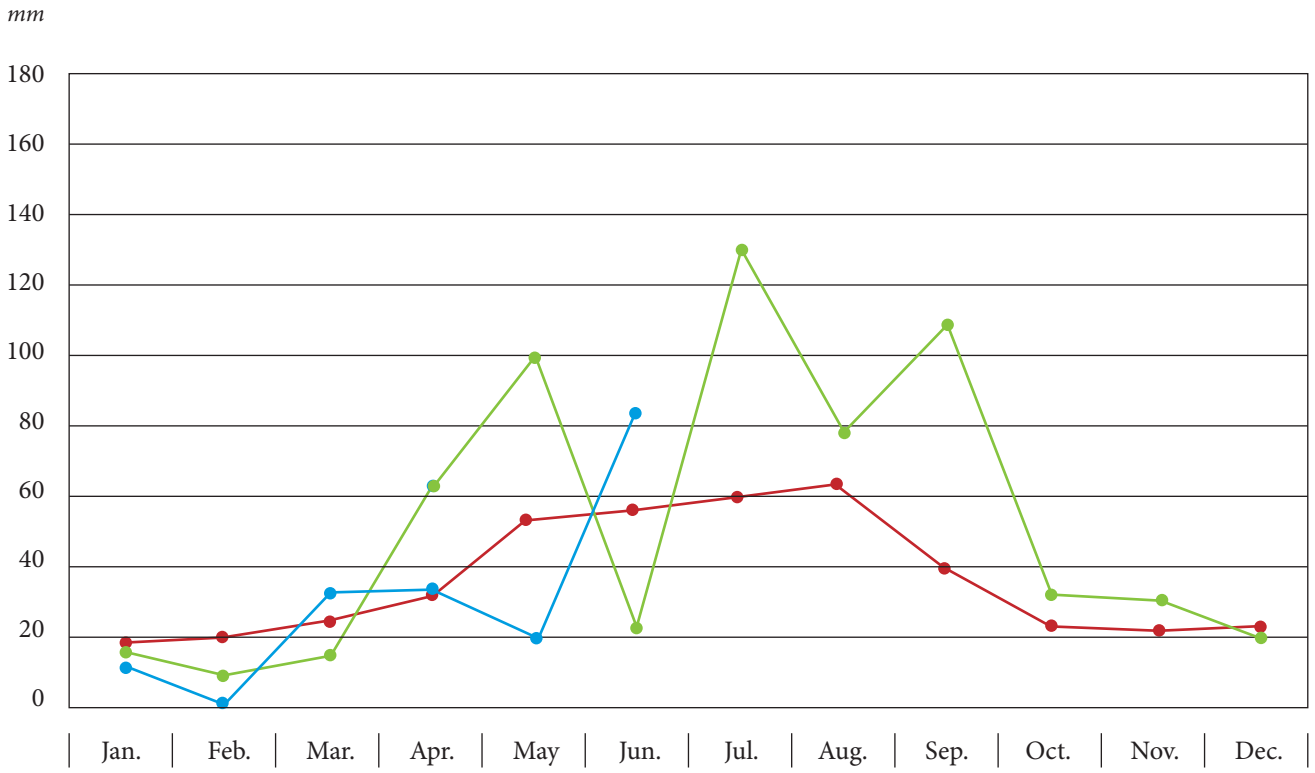
Temperatures in June 2015 were lower in relation to the long term average (-0, 3°C), but then the precipitations were above-average (152, 5% of long term average). Very important for further development of hops were the precipitations which came after the prolonged drought at the end of the first decade of June. The situation before was really critical. Hop Research Institute issued a new guideline for watering of newly planted hop vines by a dose of water containing 5 to 10 litres for one plant and for the use of water tanks (see photo). The rains in the period between 6th and 9th June, 2015 also brought local hailstorms. Approximately 40 ha of hop gardens were damaged in the Saaz area, especially in the area of municipalities Klůček and Postoloprty. During the period from 15th to 25th of June, 2015 the average daily temperatures varied below 15°C and consequently the stretching growth of hops slowed down.

GROWTH REPORT

Quite favourable climatic conditions in June kept the state of hop gardens on good level. Majority of hop gardens or hop vines, respectively, reached the height of the trellis (approx. 80%). In this respect the situation is much more favourable this year. In previous year only 40% of the hops reached the height of trellis until the end of June. Thanks to abundant precipitations the differences in the height of hops equalized, especially in case of newly planted vines. The stretching growth in majority of hop gardens is still continuing. Basically, the blossoming of hops has not been noticed up to now.

HEALTH STATE OF HOPS

The weather development in the beginning of June (drought and high temperatures) was not convenient for advancement of downy mildew of hops (Pseudoperonospora humuli Miy et Takah.). However, the primary infection of this pathogen in form of ear-shape sprouts has already appeared in some gardens. On the other hand, good conditions for development and dissemination of downy mildew of hops were created after the period of rains in the second half of June. It was therefore recommended to keep the sequence of the spraying against this disease, consisting of the preparations Ortiva, Aliette Bordeaux and Ridomil Gold plus 42, 5 WP. The application of the fungicide Curzate K was recommended if the contamination by downy mildew of hops in the hop garden is confirmed. The incidence of hop aphid (Phorodon humuli Schrank) was considerably variable. When the critical number (50 wingless nymphs for one leaf) was reached or even exceeded, the treatment with spraying by the preparations Teppeki, Confidor 200 OD or eventually Plenum was recommended. The occurrence of red spider mite (Tetranychus urticae Koch) was not so high and that is why the application of some of the preparations destined for the protection against this pest was not required.



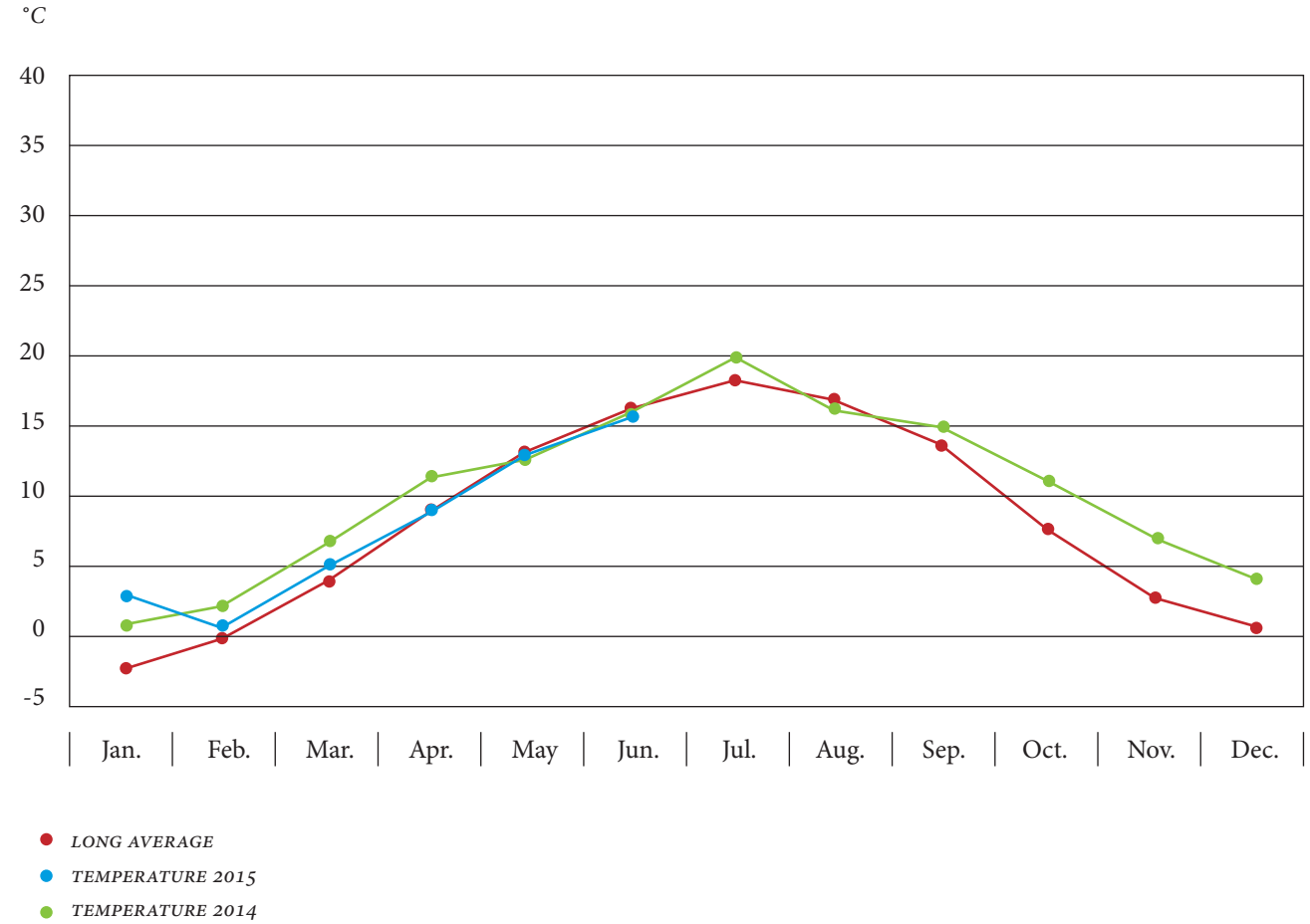


PHOTO REPORT

Watering of hop plants

Hop plant at the end of June

The first indication of blooming

Hop garden at the end of June

Saaz, July 1, 2015
Jaroslav Hájek

Chmelařstvi Cooperative Žatec

Hop report - Saaz fine aroma hops

Crop 2015 – July (Saaz region)

WEATHER CONDITION – JULY

Temperature & precipitation in July	2015	2014	30 years average
Average temperature (°C)	20,5	20,0	18,0
Precipitation (mm)	47,2	127,6	59,0
Total precipitation (mm) January-July	250,8	351,6	263,0
Max. temperature (°C)	36,4 (22.7.)	33,4 (20.7.)	
Min. temperature (°C)	5,8 (11.7.)	7,1 (3.7.)	
Max. precipitation (mm)	16,4 (5.7.)	25,0 (28.7.)	
Number of dry days	17	14	

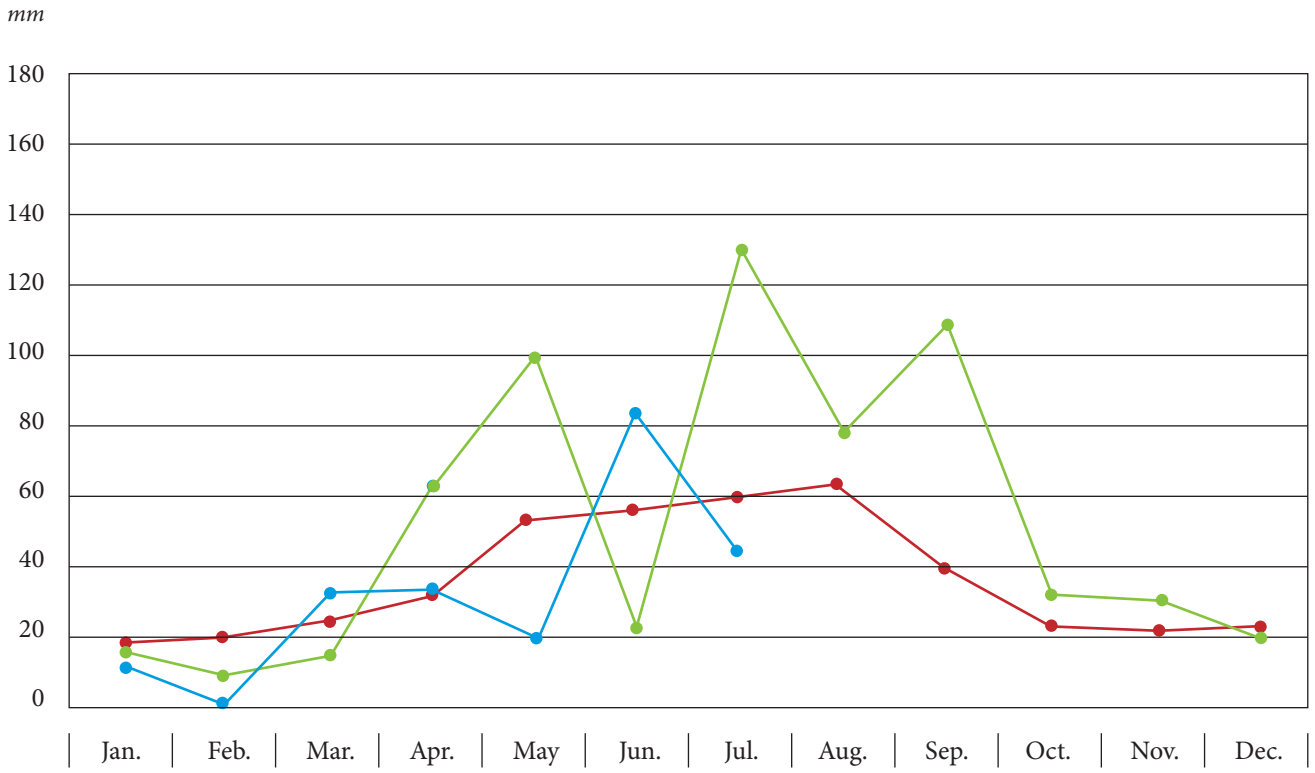
The weather in July 2015 was very unfavourable. The main problem was the lack of rainfalls and its unequal timing. During the first decade of July the precipitations reached 30, 6 mm, what represents 65% of the total month aggregate rainfalls. The precipitations amount during next two decades was only 16, 6 mm divided in nine rainy days, thus the individual rains were in fact insignificant. In majority of cases the rains had stormy character with differences in the amount of precipitations, which were unfortunately mostly lower than the figure measured by the meteorological station in Žatec (see above). As far as the temperatures are concerned, July was 2, 5°C warmer in comparison with the long term average. The number of hot days meant strong negative aspect. Altogether in 8 days in July the temperatures recorded were higher than 32°C and totally 17 days exceeded the average day (24 hours) temperature of 20°C.

GROWTH REPORT

Towards the end of June we evaluated the state of hops as very good as far as the general appearance (the habit of plants) is concerned. High temperatures during the first week of July stopped the elongation growth of hops plants and by the end of the first decade of July the hops started to blossom. The state of blossoming corresponded to the average. Further development of hops was marked by unfavourable climatic conditions (drought and mainly high temperatures). The farmers are concerned about the drying and bad development of the hop cones. Any damage of hops caused by the hailstorm or windstorm was not find out.

HOP PHYTOSANITARY INFORMATION

The infection spreading of downy mildew of hops (*Pseudoperonospora humuli* Miy et Takah.) continued also in July. For the fourth or eventually further spraying the preparations Ortiva and Bellis were recommended. Due to the short protective period also the preparation Curzate K was used. Some of the growers also applied the spraying by the cupric fungicides (Kuprikol 250SC, Cuproxat SC) already before the end of month. The use of newly registered preparations Defender or Cuprozin Progress (with lower content of copper) was also appropriate. The flyover of the sixth generation of hop aphid (*Phorodon humuli* Schrank) was finished by the beginning of July. In the same month the farmers applied the preparation Movento 150 OD and therefore the elimination of this pest can be expected. On the other side the weather conditions for the development of red spider mite (*Tetranychus urticae* Koch) were convenient. The population growth of this pest accelerated considerably. Although the preparation Movento 150 OD has also acaricide effect, towards the end of the month the farmers had to use the preparations Ortus 5SC and Vertimec 1, 8 EC against this mite. Another agent affecting red spider mite is the preparation Acramite 480 SC. The health condition of hops is considered good.



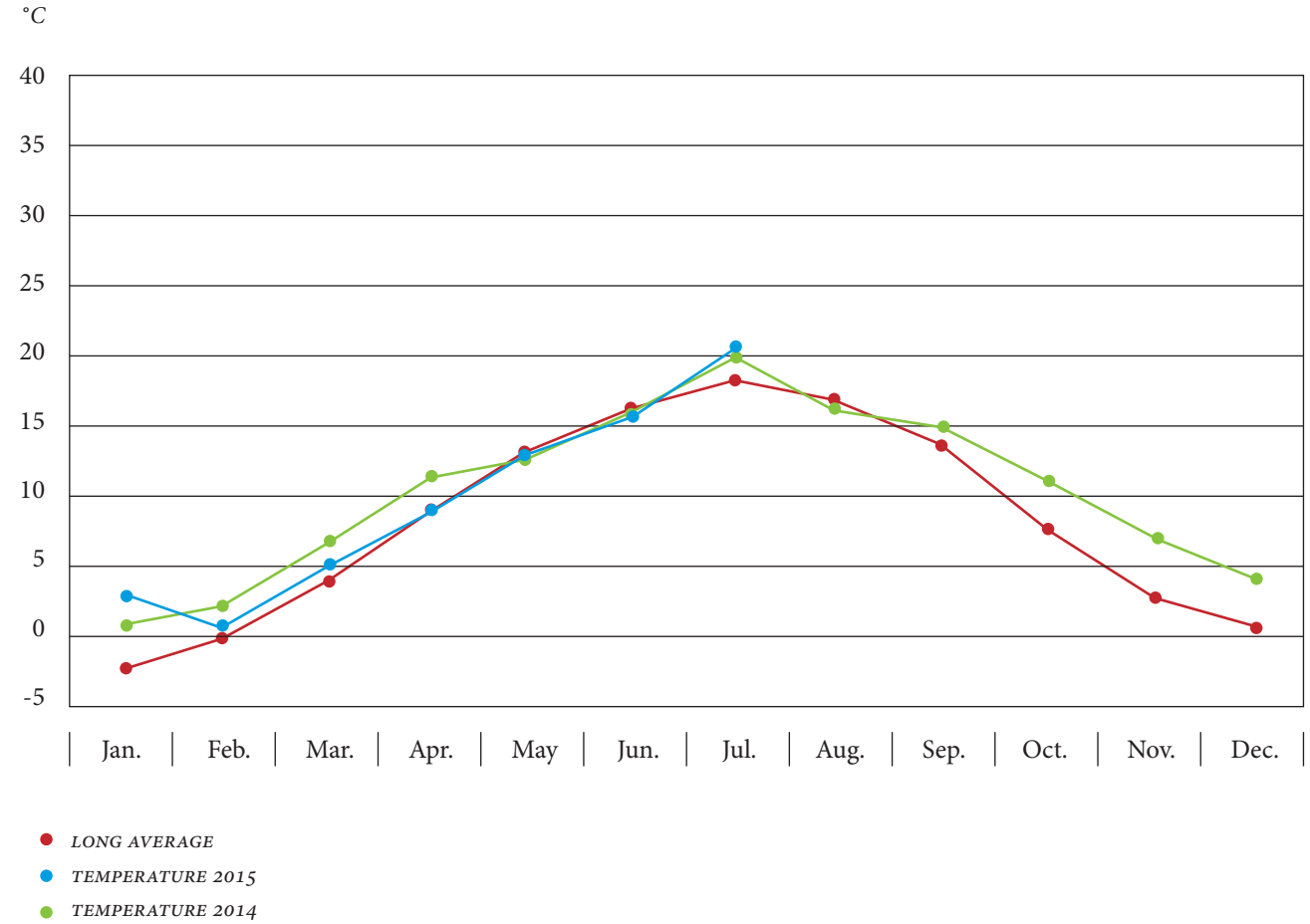


PHOTO REPORT

Fallen dry hop cones due to the high temperatures

Hop plant at the end of July

Offshoot with hop cones

Hop garden at the end of July

Saaz, August 2, 2015
Jaroslav Hájek

Chmelařstvi Cooperative Žatec

Hop report - Saaz fine aroma hops

Crop 2015 – August (Saaz region)

WEATHER CONDITION – AUGUST

Temperature & precipitation in August	2015	2014	30 years average
Average temperature (°C)	21,4	16,7	17,4
Precipitation (mm)	96,0	78,8	62,0
Total precipitation (mm) January-August	346,8	430,4	325,0
Max. temperature (°C)	37,4 (7.8.)	30,7 (10.8.)	
Min. temperature (°C)	7,8 (23.8.)	4,2 (25.8.)	
Max. precipitation (mm)	33,0 (17.8.)	25,4 (4.8.)	
Number of dry days	23	17	

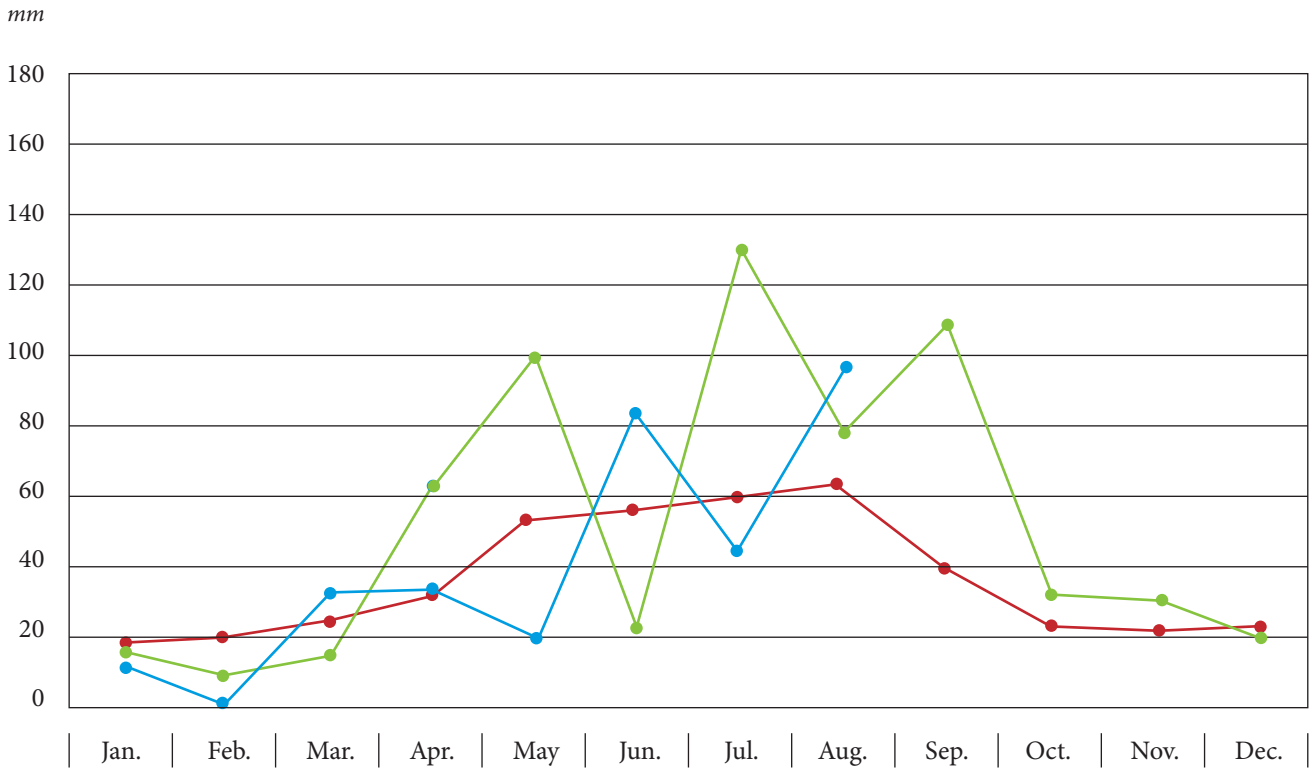
Even though the precipitations recorded in August were above long-term average, they did not influence the state of hops growth, as they came too late. The last rainfalls which had certain effect on the development of hops came between 6th and 8th July, 2015. Next rains have fallen only on 15th August and so the whole period of 37 days was without precipitation. Moreover, the temperatures in August reached the levels, which were never recorded in many meteorological stations since their establishment. The day temperatures reached more than 30°C every day between 3rd August and 14th August, 2015.

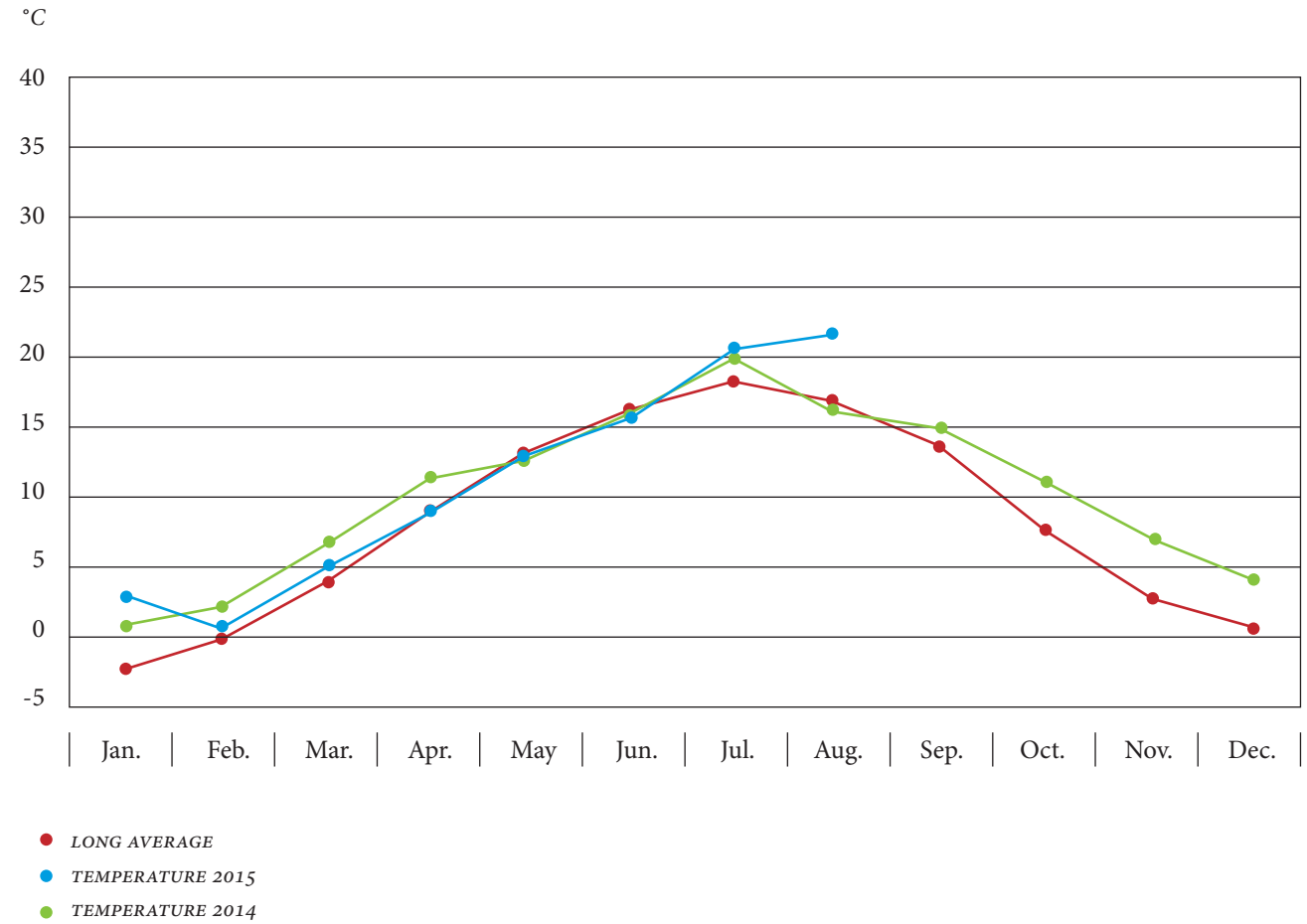
GROWTH REPORT

Climatic conditions in August completed the adverse trends in development of hops which started already in July. Due to the effect of drought and mainly high tropical temperatures the hops stopped developing, first of all it finished the growths of cones and the creation of alpha-bitter substances. The cones then remained very small and in upper parts of plants they were practically not created. Although majority of the farmers postponed the beginning of the harvest, in comparison to the normal, the situation did not improve and the results of the crop will be deeply below long-term average. Adverse climatic conditions had impact to all aspects of hops production. Majority of the farmers started to harvest within the period between 22nd and 27th August 2015. The first results of the crop, in terms of quantity and quality – content of alpha-bitter substances, are very bad and this year crop will be one of the worth in long history.

HOP PHYTOSANITARY INFORMATION

He farmers managed to keep the health state of hops on very good level until the harvest.





OTHER INFORMATION

Central Institute for Supervising and Testing in Agriculture specified the hop gardens acreage to be harvested in 2015.

The acreage of hop gardens in the Czech republic in 2015

Variety	Saaz region	Newly planted	Auscha region	Newly planted	Tirsitz region	Newly planted	Czech republic	Newly planted
Saaz var.	3 190	291	433	57	416	25	4 039	373
Agnus	35	1	3	0	0	0	38	1
Bohemie	1	0	0	0	1	0	2	0
Bor	1	0	0	0	0	0	1	0
Cascade	1	0	0	0	0	0	1	0
Hallertau	1	0	0	0	0	0	1	0
Harmonie	5	0	0	0	0	0	5	0
Kazbek	12	1	2	0	5	0	19	1
Other	11	1	0	0	0	0	11	1
Perle	1	0	0	0	0	0	1	0
Premiant	100	3	37	0	43	0	180	3
Rubin	1	0	0	0	0	0	1	0
Saaz Late	32	20	0	0	2	0	34	20
Saaz Special	20	9	0	0	0	0	20	9
Sládek	163	10	22	6	82	4	267	20
Vital	2	1	0	0	0	0	2	1
Total	**3 576**	**338**	**497**	**63**	**549**	**29**	**4 622**	**429**

ÚKZÚZ Žatec (Central Institute for Supervising and Testing in Agriculture)

Saaz, September 2, 2015
Jaroslav Hájek

Chmelařstvi Cooperative Žatec