

**For no more needed
irrigation for good
agricultural yield
growing in drought and
heat condition:**

**Very promising
attraction:**

**Advanced, novel,
energized, natural,
sustainable and effective
PRODUCT WITHOUT
ACTIVE SUBSTANCES**



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Euro-Global Conference on

**Food Science and
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*"Optimizing new paths in food science and
technology towards the global demand"*

.....

Date: September 19-21, 2019

Venue: London, UK

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 **@foodscienceconf**

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[EN web site](#) , [Sl web site](#) , www.cora-agrohhomeopathie.com/en

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APPLICATIVE RESEARCH PROJECT:

Effectiveness of the product

Cora agrohomeopathie X62

in case of drought and high temperatures in growing seasons:

**By strengthening plants vitality, implicate successful & efficient strengthening of
agricultural plants and crops
on their ability to adapt to Climate Change – to the conditions of drought and high
temperature**

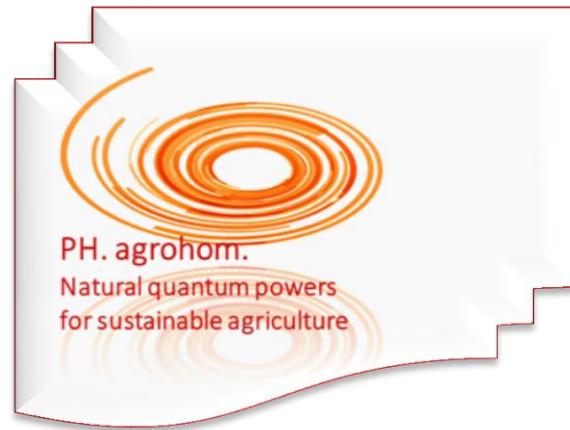


COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED
[AGRO-HOMEODYNAMICS] PRODUCTS FOR PLANTS CARE AND STRENGTHENING
VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS
RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF
ENERGY BALANCE OF SPRAYED ECOSYSTEMS.
MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

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APPLICATIVE RESEARCH PROJECT:
Effectiveness of the product
Cora agrohomoepathie X62 in case of drought and high temperature:
Successful & efficient strengthening of agric and high temperatures
in growing seasons cultural plants and crops
on their ability to adapt to Climate Change – to the conditions of drought



COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEODYNAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS. MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

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The Project materials are collected, edited and issued in this form in 2018
By Ing. Majda Ortan, PH. Agrohom., Ing. Majda Ortan, s.p., Ob Meži 30, 2391 Prevalje, Slovenia, EU

IN THIS PROJECT WERE INVOLVED:

In part 1:

-FOR. Preparing of spraying program, development of all products Cora agrohomoepathie®, Producer of products Cora agrohomoepathie®: Majda Ortan, Ing., PH. Agrohom., Ing. Majda Ortan, s.p.

-FOR: Field trial tests in growing season 2013:

Magda Rak-Cizej, Doctor of Agronomic Sciences, University graduated agronomist, Master of Science, Slovenian Institute for hops research and brewing;

Marko Zmrzlak, Doctor of Agronomic Sciences, University graduated agronomist, Master of Science, Hmezad exim, d.d.

Štefan Šlander, farmer, owner of hop-field for hop trials

- Dissemination of project results and editing project and results materials in this regards:

Janko Rode, Doctor of biological sciences, University graduated biologist, Master of Science, Virin s.p.

Marko Zmrzlak, Doctor of Agronomic Sciences, University graduated agronomist, Master of Science, Hmezad exim, d.d.

Majda Ortan, graduated engineer of chemistry technologies, PH. Agrohom., Ing. Majda Ortan, s.p.,

In part 2:

- FOR: Evaluation of some hops development results by phenofazes by BBCH, comments of these comparisons: **Janko Rode**, Doctor of biological sciences, University graduated biologist, Virin s.p.

-FOR:Editing project and results materials in this regards: **Majda Ortan**, graduated engineer of chemistry technologies, PH. Agrohom., Ing. Majda Ortan, s.p.,

*** For comparison of results for hops growing with use of product Cora agrohomoepathie X62 (hops variety Aurora, year 2013), we used data, which we were got from Institute for hops research and brewing, Žalec/ Slovenia – from their monitorings their on hops growing fields, location Žalec/Slovenia (hops variety Aurora, year 2013).

PART I. – Hops field trials of hops growing with products Cora agrohomeopathie® in growing season 2013:

Summary for Part I

I.1The reason for the hops field trials (2013), the purpose of the hop field trials (2013), the working hypothesis.

I.2 Content from published post:

- Some data about hops growing in Slovenia
- Location of this hop field trial in 2013
- Hops, variety Aurora
- Soil
- Agrometeorological factors, important for hops growing
- Major hops diseases ,description
- Major hops pests, description
- Phenophase (BBCH scale)

I.3Materials and methods

- Design of hops field trials: spraying program for products Cora agrohomeopathie® for hops, Used products properties and product documentation, Mode of monitoring- monitoring frame program; Methods for monitoring, evaluating etc.

I.4 Implementation of hop field trials:

- Weather and climate conditions
- Implementation of spraying program
- Implementation of monitorings and tests
- Results

I.5 Discussion and conclusions

I.6 Summary for Part I

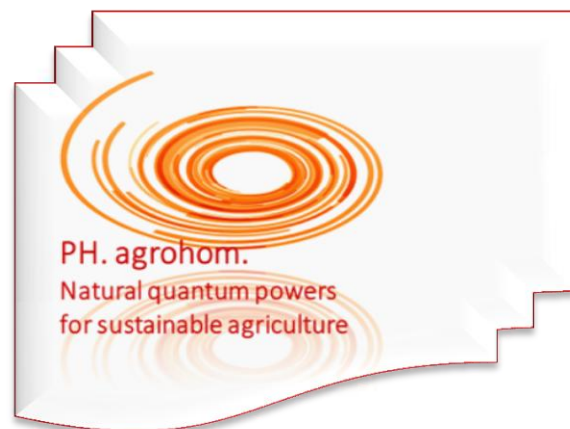
Part II. - EXPOSE OF EVALUATING EFFECTIVENESS OF PRODUCT Cora agrohomeopathie X62 on strengthening vitality of plants with specific effects on strengthening plants adaptability on drought and high temperatures as well as to strengthening plants resistance to stress because of drought and high temperatures

Content

II.1. The reason for the expose of evaluating effectiveness of product Cora agrohomeopathie X62; link	II.5. Results, (link) * NOTE: Test Results are from first part of the projects (link)
II. 2 Abstract, Summary, conclusion; link	II.6. Comparisons of scientific findings and monitorings results with monitoring and tests results of hops from hops field trials, where on variety Aurora product Cora agrohomeopathie X62 was used on not irrigated hop fields in 2013; link
II.3 Methods; link	II.7= II.2 Abstract, Summary, conclusion, link
II.4 Content of published posts: 1. Weather circumstances 2013 March – August): •Temperatures, precipitation, drought; link •Long terms observation –weather circumstances effect to the growing od hop and to the cones yield; Kf factor; link 2. Results of Slovenian Institute for hops research and breewing from their irrigated hops fields: monitorings of hops development per BBCH scale, Quantity of yield, content of alpha acids in harvested hops cones; hop Variety Aurora, field location: Savinjska valey, year 2013; link	

APPLICATIVE RESEARCH PROJECT:
Effectiveness of product Cora agrohomeopathie X62
in case of drought:

Successful & efficient strengthening of agricultural plants and crops on their ability to adapt to Climate Change – to the conditions of drought



COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEODYNAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS. MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

I.1 The reason for the hops field trials (2013), the purpose of the hop field trials (2013), the working hypothesis; [link](#)

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The reason for this Applicative Research Project:
WE HAVE SOLUTION FOR THE MOST IMPORTANT PROBLEM OF NOWADAYS AND FUTURE AGRICULTURE:
WITH USE OF OUR PRODUCT Cora agrohomeopathie X62 is already achieved successful, effective strengthening of plants
ability
to successfully adapt themselves to the drought conditions!

- Global Climate Changes in the global Agriculture causing severe difficulties by increasingly frequency, increasingly duration and increasingly demanding of droughts.
- The response of the agro-industry is reflected in the development of products aimed to mitigation of plant stress on drought.
- In company PH. Agroh., we have much higher and deeper goals that solve the problem for causes and additionally mitigate the consequences.
- The root cause of the problems caused by drought to cultivated plants in agriculture is poor, weakened or no (more) existing ability of plants to adapt themselves to the drought conditions, to Climate Change. Additionally is needed to strengthening the ability of plants to regenerate themselves from the stress effects of drought, dry stress, injuries due to drought. The soil has similar problem, so also this is needed take into account by holistic, natural and sustainable solution.

- We already have it and want with its offer to serve Global Agricultural market, to prevent Agricultural damage on plants and crops due to the effects of drought.
- **Our own developed, own produced product Cora agrohomeopathie X62 already is and will be more and more important, highly topical and necessary solution, both - globally and for Agricultural production markets, where trends of drought due to Climate Changes per forecasts will be the most increasing (China and other parts of Asia, Brazil, America, some parts of Europe).**
- Our product Cora agrohomeopathie X62 implicitly (by strengthening plants vitality), specific strengthening plants ability to adapt themselves to the conditions of drought, to plants stress, to regeneration after injuries caused due to drought stress, heat stress, water stress.
- This is our innovative, sustainable, natural and clean solution aimed to preventing drought losses that can affect farmers, entire countries, continents as well as humanity due to food shortages.

APPLICATIVE RESEARCH PROJECT:
Effectiveness of product Cora agrohomeopathie X62
in case of drought despite to the lack of water for irrigation :
Successful & efficional strengthening of agricultural plants and crops on their ability to adapt to Climate Change – to the conditions of drought



COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEODINAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS. MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

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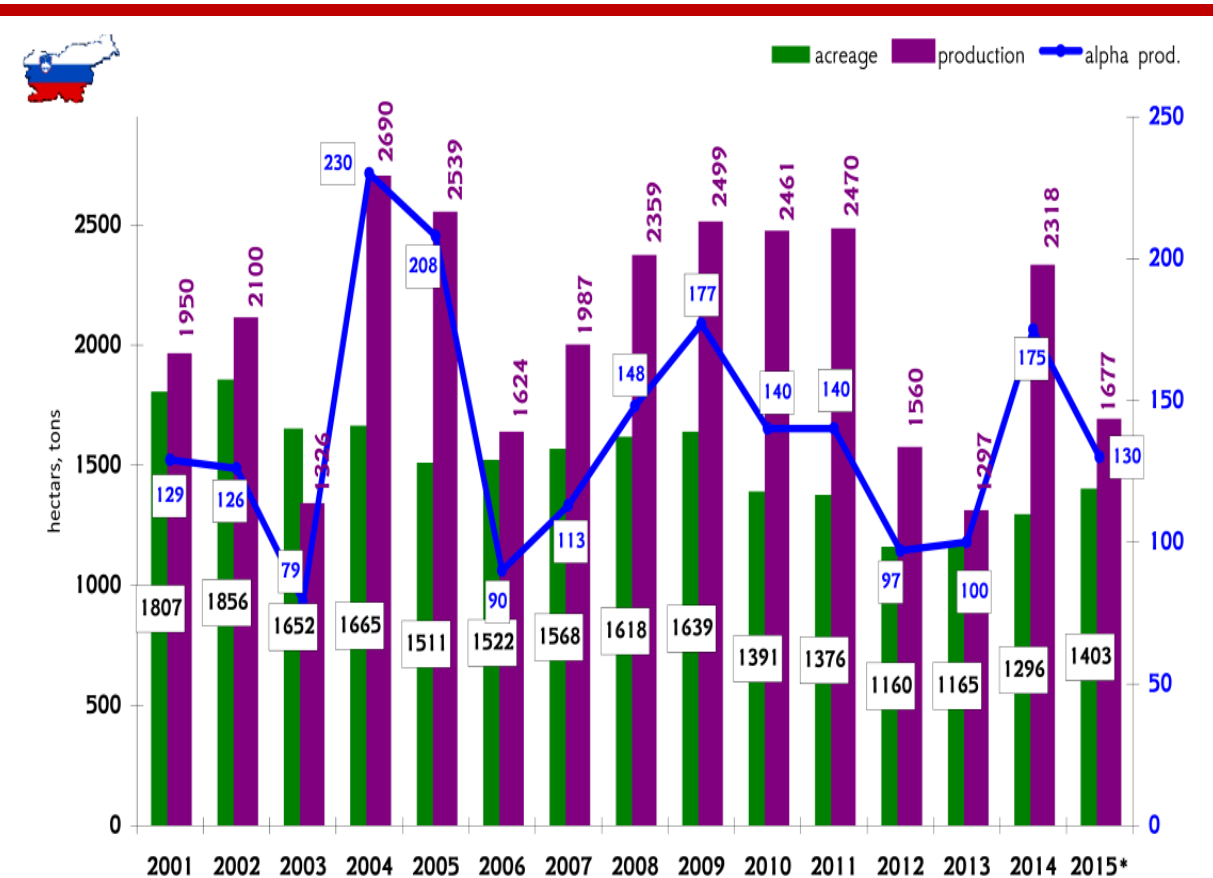
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I.1 The reason for the hops field trials (2013), the purpose of the hop field trials (2013), the working hypothesis.

- The reason was positive answering to efforts to find out how to produce hops without pesticides.
- The purpose was to confirm, that is possible to produce hops without use of pesticides, with using of natural, energized, homeodinamic products Cora agrohomeopathie (code nr. C1,C3, X66, X62), which should be used per spraying program for useage of products Cora agrohomeopathie® for professional hops growing and with taking into into account requirenets for products from products Label.
The purpose was, that quaninty of crops from hop test trials will be comparible with the crops of same variety and same year from integrated mode of hops production and contence of alpha acids in air dry cones should be better than in cones from hops of samevariety and same year from integrated mode of hops production (average values of year).
- The work hypothesis was confirmed reason and purpus described above.

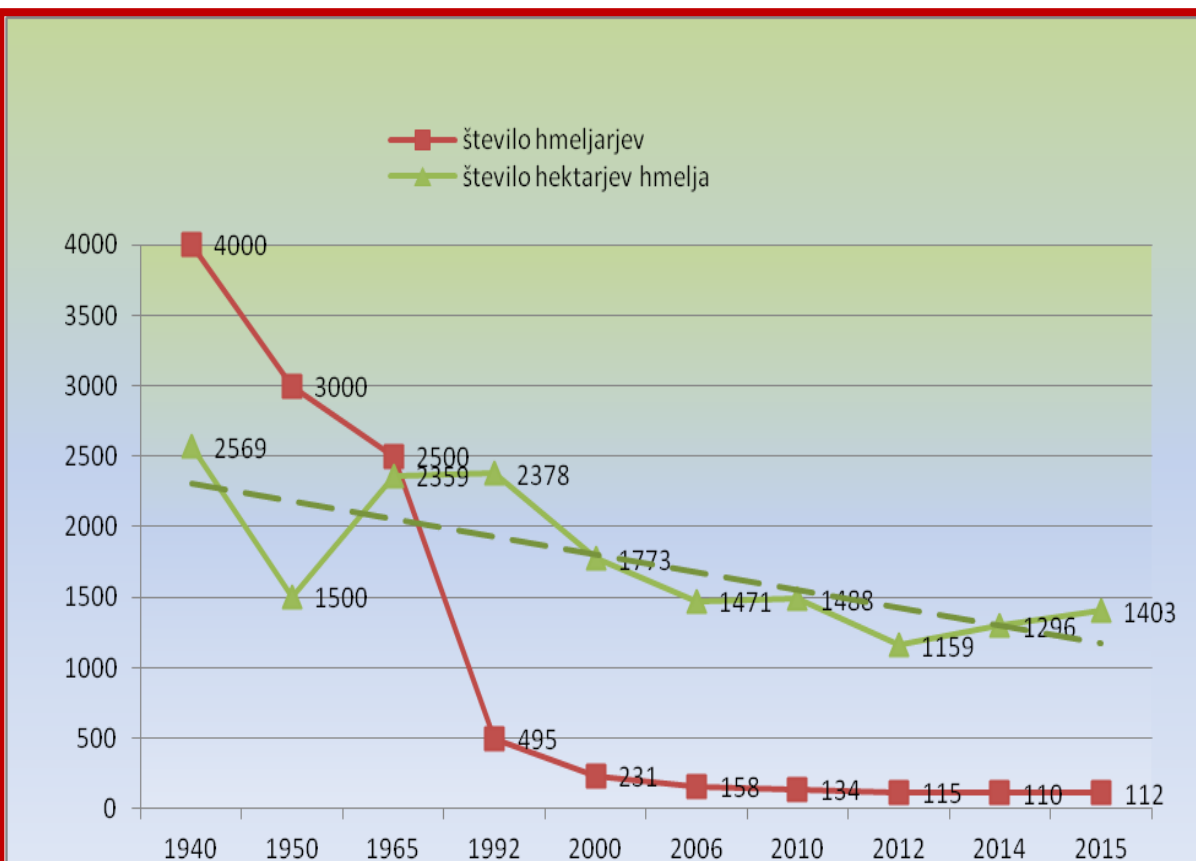
Statistics of hop area cultivated (ha) the hop production (t) and the production of bitters (t) in Slovenia from 2001 to 2015

Source: The five-year development program of the Institute for Hop Research and Brewing Republic of Slovenia 2017 – 2021; Chart 2



The number of hop growers in the Republic of Slovenia (Red: The number of hop growers, green: the number of hectares of hop)

Source: The five-year development program of the Institute for Hop Research and Brewing Republic of Slovenia 2017 – 2021, the Institute for Hop Research and Brewing Republic of Slovenia ; Chart 3



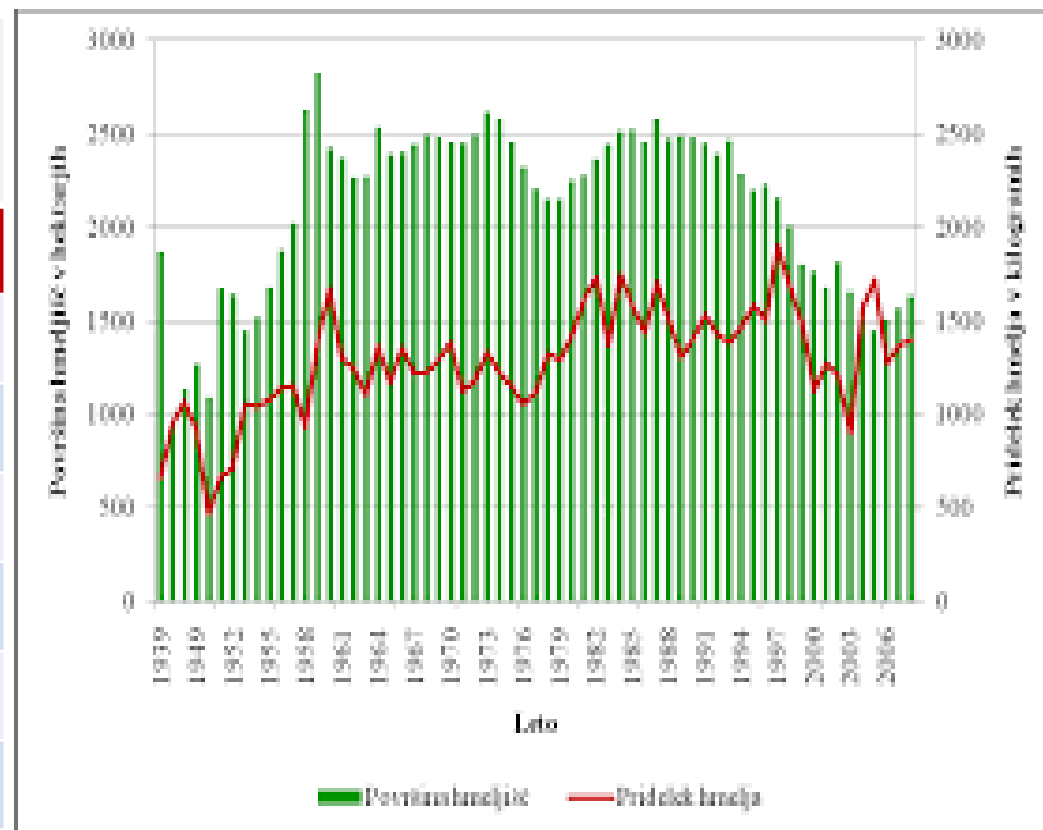
**INŠTITUT ZA HMEJARSTVO
IN PIVOVARSTVO SLOVENIJE**
Slovenian Institute of Hop Research and Brewing

Areas in Slovenia under hops, average yield in years 2007 – 2013,
Spreadsheet right side - Sources: (1)Hmeljar 2013, letnik 75 (Inštitut za hmeljarstvo in pivovarstvo Slovenije) ,
(2) Hmeljar 2014, letnik 76 (Inštitut za hmeljarstvo in pivovarstvo Slovenije):

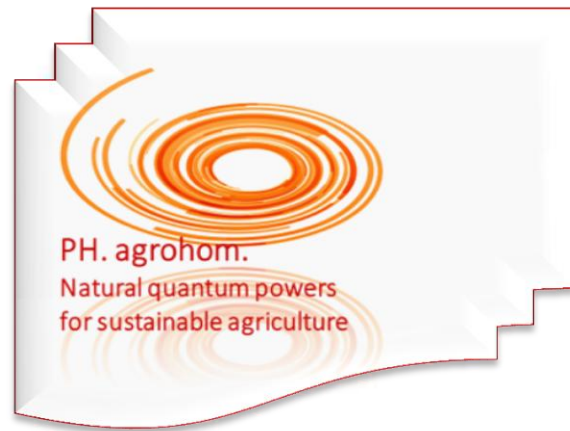
Pridelava hmelja v Sloveniji v obdobju 2007–2012, Joško Livk Inštitut za hmeljarstvo in pivovarstvo Slovenije

(3) Povprečen pridelek hmelja v letu 2014 presegel 2 t/ha, Joško Livk, Inštitut za hmeljarstvo in pivovarstvo Slovenije, Joško Livk, Inštitut za hmeljarstvo in pivovarstvo Slovenije; Spreadsheet 1

Year	Shifting hops surfaces (ha)	First-year plantations (ha)	Fertile plantations (ha)	All plantations (ha)	All plantations + shifting surfaces (ha)	Crop (tons)	Fertil plantations crop (tons/ha)
2013	1061	105	626	1166	1792	1297	1222
2012	636	57	1102	1159	1795	1559	1414
2011	453	25	1351	1376	1829	2470	1828
2010	374	38	1450	1488	1862	2461	1697
2009	207	124	1393	1517	1724	2500	1794
2008	254	86	1532	1618	1872	2359	1539
2007	302	106	1467	1573	1875	1987	1354



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Successful & efficient strengthening of agricultural plants and crops
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I.2 Content from published post:

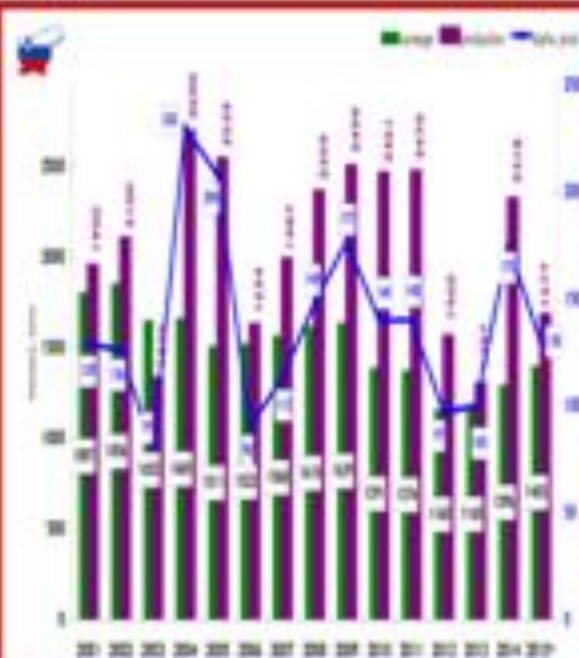
- Some data about hops growing in Slovenia, [link](#)
- Regarding to this Aplicative Research Project: Location of hop field trial in 2013, [link](#)
- Hops, variety Aurora (content under link, [here](#))
- Soil [link](#))
- Agrometeorological factors, important for hops growing, (Hop and drought 2013- [link](#) ; overall- [link](#)
- Major hops diseases ,description ([link](#))
- Major hops pests, description ([link](#))
- Phenophasis (BBCH scale), ([link 1](#), [link 2](#))

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SOME DATA ABOUT HOPS GROWING IN SLOVENIA

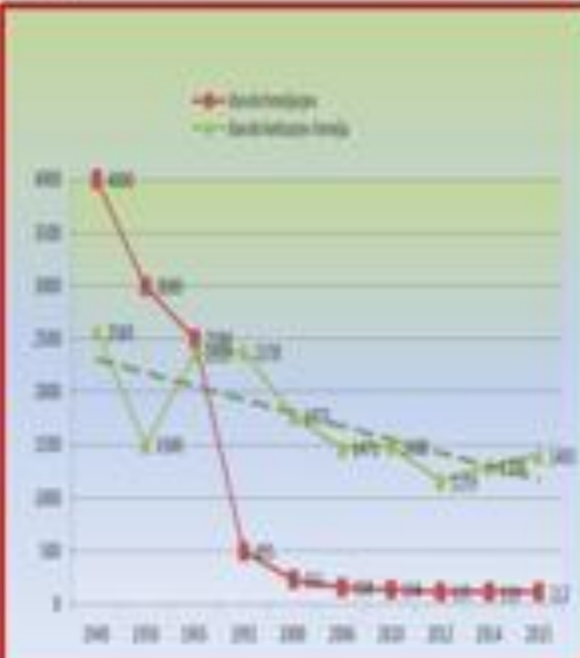
Statistics of hop area cultivated (ha) the hop production (t) and the production of bitters (t) in Slovenia from 2001 to 2015

Source: The five-year development program of the Institute for Hop Research and Brewing Republic of Slovenia 2017 - 2021, Chart 2



The number of hop growers in the Republic of Slovenia (Red: The number of hop growers, green: the number of hectares of hop)

Source: The five-year development program of the Institute for Hop Research and Brewing Republic of Slovenia 2017 - 2021, the Institute for Hop Research and Brewing Republic of Slovenia, Chart 3



Areas in Slovenia under hops, average yield in years 2007 - 2015

Source: Statistical Office of the Republic of Slovenia, City of Ljubljana, Statistical Office of the Republic of Slovenia, Statistical Office of the Republic of Slovenia, Statistical Office of the Republic of Slovenia, Statistical Office of the Republic of Slovenia, Statistical Office of the Republic of Slovenia

Year	Area under hops (ha)	Area under hops (ha)	Area under hops (ha)	Area under hops (ha)	Area under hops (ha)	Area under hops (ha)	Area under hops (ha)
2007	1065	189	626	1166	1792	1197	1222
2012	636	17	1032	1010	1705	1110	1414
2013	612	25	1031	1076	1820	1470	1828
2014	514	38	1450	1488	1862	1461	1607
2015	207	124	1815	1517	1724	1500	1794
2016	254	86	1532	1618	1872	1510	1510
2017	502	106	1447	1575	1875	1587	1554

Hop growing plantations (green surfaces) in Dolenjska Valley, Slovenia (Source: Statistical Office of the Republic of Slovenia)





REPORT OF FIELD TRIAL: Monitoring of effects of using of products Cora agrohhomeopathie® per comprehensive spraying Program for hop growing (Comprehensive Test/ Field Trials Program) in growing season 2013

Location: Grajska vas, Slovenia

Owner of hop culture and hops fiel plantation: Mr. Štefan Šlander ; hop's variety: Aurora

Soil type: Eutric Fluvisol, with loam texture
and gleyic horizont bellow 70 cm.

Acreage: 2.14 ha

Field trial acreage: 0.55 ha

Growing season: 2013

Project cooperation of: PH. Agroh., Ing. Majda Ortan, s.p., Hmezad exim, d.d., Žalec, Slovenian Institute of Hop Research and Brewing, Farmer Štefan Šlander;

Roles of participants in project: [under link here](#)

HOP'S VARIETY AURORA WAS USED for our "Hops field trials (2013)"



Hop diseases: Level of resistance Aurora variety to hops diseases

Source: <http://inbarco.si/sorte-hmelja/super-styrian-aurora/>

Hop downy mildew (<i>Pseudoperonospora humuli</i>) -primary infection	Medium	Detailed information
Hop downy mildew (<i>Pseudoperonospora humuli</i>) -secondary infection	High	Detailed information
Hop powdery mildew (<i>Sphaerotheca macularis</i>)	High	Detailed information
Verticillium vild (<i>Verticillium albo-atrum</i> ; <i>Verticillium dahliae</i>) -mild form	Medium	Detailed information
Verticillium vild (<i>Verticillium albo-atrum</i> ; <i>Verticillium dahliae</i>) -lethal form	Low	Detailed information

Aurora Hop's Variety Characteristics:

- Aurora is an aromatic variety planted at the Institute of Hopper and Brewery of Slovenia in Žalec, and is a descendant of the English variety Northern Brewer, and Slovenian heritage.
- The variety is characterized by very good agronomic characteristics for the production and harvesting of hops.
- Aurora is recognized for its pleasant hop flavors and bitters, which are reflected in very good brewing value.
- Corns are medium oval on average 29mm long. 100 dry cones weighs on average 15g.
- The shape of the plant is cylindrical.
- The vine is weakly reddish.
- Technological maturity: medium-sized.
- Storage persistence: very good.
- Yield: Per catalogue data 1600-2400 kg / ha.

Agrometeorological factors, important for hops growing

Factor	Harmful effect	Consequences of harmful effects
Heat	Drought	Detailed information
Precipitation	Drought	Detailed information
	Hail	Detailed information
Light	Lack of Light	Detailed information
Wind	Strong Wind,	Detailed information
	A Whirlwind	Destroyed hop plantation, broken hop wires and plants

Hop's pests	Consequences/ Damage of Pests Attack	
Hop aphid (<i>Phorodon humuli</i>)	Harmful	Detailed information
Hop flea beetle (<i>Psylliodes punctulatus</i> Koch)	Harmful	Detailed information
Hop spider mite (<i>Tetranychus urticae</i>)	Harmful	Detailed information

APPLICATIVE RESEARCH PROJECT:

Effectiveness of the product
Cora agrohhomeopathie X62 in case of drought and high temperatures in growing seasons :

Successful & efficient strengthening of agricultural plants and crops
on their ability to adapt to Climate Change – to the conditions of drought- **Case of good practice in hop growing without pesticide**

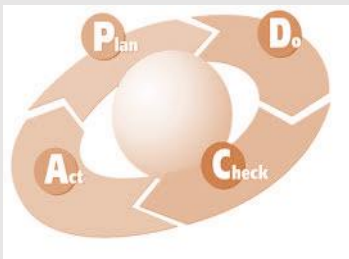


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Plan of hops field trials, 2013:

- Products for spraying, [link](#)
- [Planned Mode of monitoring](#), [Methods for monitoring and evaluation](#)
- Comprehensive Spraying Program for implementation hop fields trials, 2013, [link](#)
- Criteria for monitoring performance of effects of using of products Cora agrohhomeopathie° per sprinkling program, [link](#)

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APPLICATIVE RESEARCH PROJECT:

Effectiveness of the product

**Cora agrohomeopathie X62 in case of drought and high temperatures in growing seasons :
Successful & efficient strengthening of agricultural plants and crops
on their ability to adapt to the conditions of drought, heat- Case of good practice in hop growing
Planning stage**

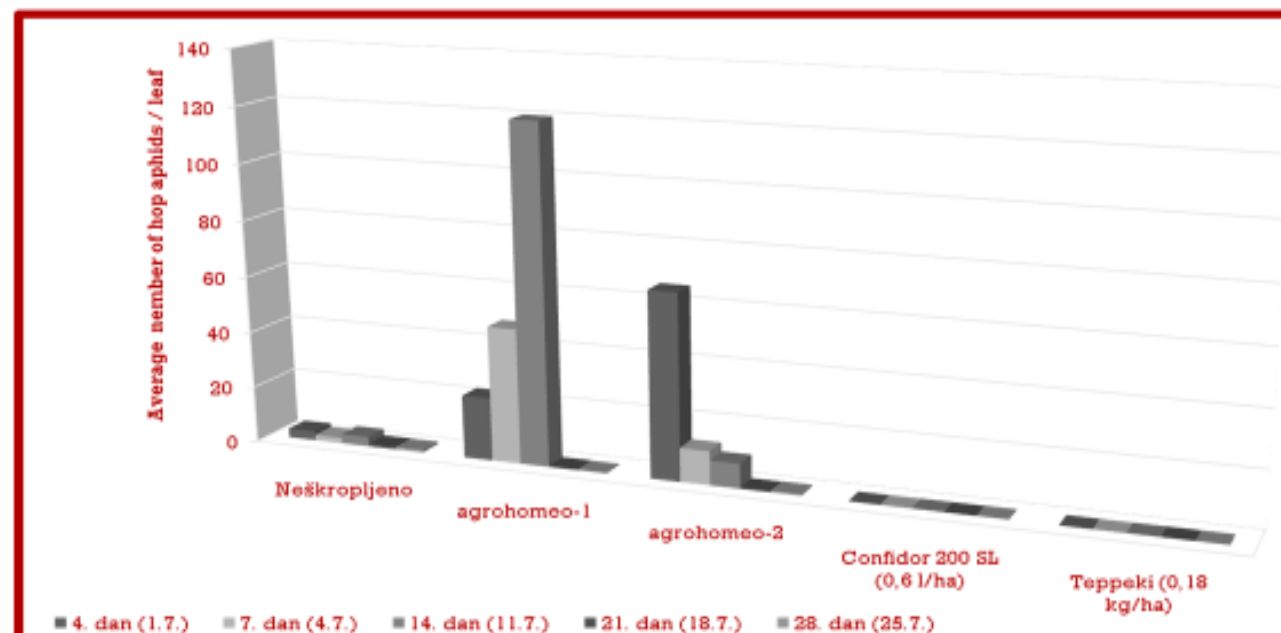
- **(1st) PLAN OF COMPREHENSIVE SPRAYING PROGRAM**
- **PRODUCTS USED FOR THE IMPLEMENTATION OF SPRAYING PROGRAM FOR FIELD TRIALS IN HOPS, 2013, PRODUCT'S CHARACTERISTIC, PRODUCT'S DOCUMENTATION**
- **PHENOLOGICAL GROWTH STAGES AND BBCH-IDENTIFICATION KEYS OF HOP [page 1](#), [page 2](#)**
- **MONITORING METHODS & EVALUATION CRITERIA FOR TESTED HOP GROWING PLANTATIONS and hop cones/hops: [page 1](#), [page 2](#), [page 3](#)**
- **REASONS FOR ADAPTED MODES OF MONITORING/EVALUATING OF PESTS: [page 1](#), [page 2](#), [page 3](#)**
- **FINALLY DEFINED / SELECTED MODE OF MONITORING PROGRAM**



The appearance of Damson aphids indicated, that some other mechanisms of control are involved in interaction between pests and treated plants where potential win – win situation is created

Source: Some Experiences with Alternative Control of Pests in Hops with Cora agrohomeopathie® products
M. Ortan¹, M. Zmrzлак², M. Rak Cizej³ and J. Rode⁴; ¹Agrohomeopatija za rastline in škodljivce M. Ortan s.p. Ob Meži 6, 2391, Prevalje, Slovenia; ²HMEZAD Exim d.d., Vrečerjeva ulica 14, 3310 Zalec, Slovenia; ³Institut za hmeljarstvo in pivovarstvo Slovenije, Zalskega tabora 1, 3310 Zalec, Slovenia; ⁴VIRIN, Trsteniška ulica 4, 3272 Rimske Toplice, Slovenia

Graph 1: Average number of Damson hop aphids per leaf; (Source: Zmrzлак, Rak-Cizej, Šlander 2013)



With the exception of seven hop plants, the hop plants sprayed with spray from products Cora agrohomeopathie® were intact despite to the presence of the aphic population as stated in the Graph 1. Hop cones were also intact.

FINALY SELECTED MODES OF MONITORING HOPS TRIAL PLANTATIONS

(Please, take in account also slide titled: “Reasons for addapted Modes of monitoring of pests on hops trial plantation”).

Sources:

- (1)REPUBLIC OF SLOVENIA, MINISTRY OF AGRICULTURE AND ENVIRONMENT,THE MANAGEMENT OF THE REPUBLIC OF SLOVENIA FOR SAFE FOOD, VETERINARY AND PLANT HEALTH: METHOD OF TESTING THE VALUE OF VARIETY FOR PRODUCTION AND USE (VPU)
HOPS (Humulus lupulus L.),(UVHVVR-VPU / 1/2), Annex 2
- (2) Project Reports-Material for Article – Mag. MarkoZmrzlak, Hmezad exim d.d., Dr. Magda Rak – Cizej, Slovenian Institute for hop research and brewing, Štefan Šlander;

Plants diseases/pests, stress to:	Finaly selected Modes of monitoring	Plants stress to:	Finaly selected Modes of monitoring
Hop spider mite (<i>Tetranychus urticae</i>	Determining the consequences of the appearance of these pests on the hop; phenological development of hops; crops per quantity and quality		
Hop flea beetle (<i>Psylliodes attenuatus Koch</i>)	Determining the consequences of the appearance of these pest on the hops; crops per quantity and quality	Drought	Relevant meteo data, occurrence, and observing of signs of drought consequences on plants; phenological development of hops; crops per quality and quantity
Damson Hop Aphid (<i>Phorodon humuli</i>)	Determining the consequences of the appearance of these pests on the hop; phenological development of hops; crops per quantity and quality	Too much precipitation	Relevant meteo data, occurrence and observing of on plants signs of consequences of too much rain; phenological development of hops crop per quality in quantity
Hop Powdery Mildew (<i>Sphaerotheca macularis</i>)	Observing the occurrence of signs of this disease on the hops; Method: REPUBLIC OF SLOVENIA, MINISTRY OF AGRICULTURE AND ENVIRONMENT,THE MANAGEMENT OF THE REPUBLIC OF SLOVENIA FOR SAFE FOOD, VETERINARY AND PLANT HEALTH: METHOD OF TESTING THE VALUE OF VARIETY FOR PRODUCTION AND USE (VPU) HOPS (Humulus lupulus L.),(UVHVVR-VPU / 1/2), Annex 2	Strong wind,	Relevant meteo data, occurrence and observing of on plants signs of consequences of tstrong wind; phenological development of hops crop per quality in quantity
Hop Downy Mildew (<i>Pseudoperonospora humuli</i>)	Observing the occurrence of signs of this disease on the hops; Method: REPUBLIC OF SLOVENIA, MINISTRY OF AGRICULTURE AND ENVIRONMENT,THE MANAGEMENT OF THE REPUBLIC OF SLOVENIA FOR SAFE FOOD, VETERINARY AND PLANT HEALTH: METHOD OF TESTING THE VALUE OF VARIETY FOR PRODUCTION AND USE (VPU) HOPS (Humulus lupulus L.),(UVHVVR-VPU / 1/2), Annex 2	Hail	Relevant meteo data,occurence and observing of on plants signs of consequences of hail; phenological development of hops crop per quality in quantity

Characteristics of Cora agrohomeopathie® products used in the spraying program for hops for field trial 2013

Source:

Product's Cora agrohomeopathie® documentation – PH. Agrohóm., Ing. Majda Ortan s.p. ;

***NOTE:

To be possible to monitoring and evaluated effects of product X62 on development of hops plants on not irrigated trial-hop -ields in severe drought 2013, was needed also provided, that in our hops field trials, hops plants were also effective strengthening of their vitality and thus also strengthening of hops plants own resistance to diseases and pests, while pesticides were not used. *(So was also achieved project target about possible growing of hops by biological mode)*. For this products Cora agrohomeopathie C1, Cora agrohomeopathie C3 and Cora agrohomeopathie X66 were used. In spreadsheet below are stated all four products.

Products Cora agrohomeopathie® Code	Product's Specification Data Sheet	Safety Data Sheet (ethanol, 43% m/m)	Product's Label
<u>X62</u>	<u>Product's Cora agrohomeopathie X62 Specification Data Sheet</u>	<u>Safety data sheet for ethanol 43% m/m, according to Regulation (EC) No. 2015/830/EU</u>	<u>LABEL – Cora agrohomeopathie X62</u>
***X66	<u>Product's Cora agrohomeopathie X66 Specification Data Sheet</u>	<u>Safety data sheet for ethanol 43% m/m, according to Regulation (EC) No. 2015/830/EU</u>	<u>LABEL - Cora agrohomeopathie X66</u>
***C1	<u>Product's Cora agrohomeopathie C1 Specification Data Sheet</u>	<u>Safety data sheet for ethanol 43% m/m, according to Regulation (EC) No. 2015/830/EU</u>	<u>LABEL - Cora agrohomeopathie C1</u>
***C3	<u>Product's Cora agrohomeopathie C3 Specification Data Sheet</u>	<u>Safety data sheet for ethanol 43% m/m, according to Regulation (EC) No. 2015/830/EU</u>	<u>LABEL - Cora agrohomeopathie C3</u>

COMPREHENSIVE SPRAYING PROGRAM /SPRAYING PLAN – HOP FIELD TRIAL TESTIMONIALS:

GROWING HOPS BY SUSTAINABLE WAY - per program Cora agrohomoepathie®, with products Cora agrohomoepathie®, by farmer: Šlander, sort of hop: Aurora, year 2013

Source:
*Comprehensive Spraying program for hops 2313- for spraying with products Cora agrohomoepathie®, PH. Agrohomo, Ing. Majda Ortan, s.p. ;
 Phenophases were determined in cooperation with Mag. Marko Zmrzлак,
 Hmezad exim, d.d.*



Treatment No 1: Spraying with respect to hops phenophase:	I. treatment	II. treatment
Products Cora agrohomoepathie®	(X66 + X62)	(X66 + X62) + C1 + C3
Instructions for preparing the spray, spraying, safety and storage of the product:	Per producer- PH. Agrohomo, Ing. Majda Ortan, s.p. : Label, General instruction for use of products Cora agrohomoepathie®, Safety and warning instructions.	Per producer: PH. Agrohomo, Ing. Majda Ortan, s.p. Label, General instruction for use of products Cora agrohomoepathie®, Safety and warning instructions.
Date of spraying:	xx of Maj 2013	From end of June 2013 till first half of July 2013
Phenophaze:	Immediately after regulation of hops to the wires, at the height of the hops 1,2 m)	Immediately after the appearance of the first flowers
Spray device:	Sprayer	Sprayer
Water consumption:	Q = 400 L/1 m of height of the shoots	Q = 1500 L/ha
Dosage of product for (1 ml of product/1L of water):	400 ml/ha on consumption of 400 L vode/ha	1500 ml/ha
Quantity od product per testimonials surface (ml)	X66 = 104 ml X62 = 104 ml	X66 = 390 ml X62 = 390 ml C1 = 390 ml C3 = 390 ml
Application execution	Morning on evening	Morning or evening

**MONITORING & EVALUATION METHODS
FOR TESTED HOP GROWING PLANTATIONS,
(Hop trials),WHERE PRODUCTS Cora agrohomeopathie® in growing season 2013
have been used instead of pesticides, Page 3**

Sources:

- (1) METHOD OF TESTING THE VALUE OF VARIETY FOR USE AND USE (VPU) HOP (*Humulus lupulus* L.) (UVHVVR-VPU / 1/2), Republic of Slovenia Ministry of Agriculture and Environment
Authority of the Republic of Slovenia for food safety, veterinary and plant health;
(2) <http://spletni2.furs.gov.si/agromeT/feno/feno.asp?ID=16>;

Harmful organism	Method
Hop downy mildew (<i>Pseudoperonosporahumuli</i> (Miya be & Takah.) G.W. Wils) (1)	Primary infection: The number of systemically infected is detected shoots on the basis of which the individual infection rate is determined variety. Secondary infection: Estimation of corneal disorder after a scale of 0-4: 0 = without infection, 1 = up to 1%, 2 = 1-5%, 3 = 5-20%, 4 = above 20%. The basis of the estimates is determined by the degree of infection according to the TownsendHeuberger formula. per Method in source (1)
Hop Powdewry Mildew (<i>Sphaerotheca macularis</i>), (1)	Estimation of corneal disorder on a scale of 0-4: 0 = no infection, 1 = to 1%, 2 = 1-5%, 3 = 5-20%, 4 = above 20%. Based on ratings determines the degree of infection according to the Townsend-Heuberger formula per Method in source (1)
Hop spider mite (<i>Tetranychus urticae</i>), (1)	Visual: Monitoring the phenomenon, per Method in source (1)
Hop flea beetle (<i>Psylliodes attenuatus</i> Koch), (1)	Visual: Monitoring the phenomenon, per Method in source (1)
Damson Hop Aphid (<i>Phorodon humuli</i>), (1)	Visual: Monitoring the phenomenon, per Method in source (1)
Alpha Acid Content	Method
The content of hop resins (alpha-acids) in the cone - during ripening and when harvesting	Conductometric value of hops with toluene extraction - KVH-TE (Analytica-EBC 7.4 2000) per per Method in source (1) – in its attachment 2

Criteria for monitoring performance of effects of using of products Cora agrohomeopathie° per sprinkling program (Comprehensive Test/ Field Trials Program);

HOPS PESTS	HOPS DISEASES	HOPS STREESS TO:	Criteria for monitoring performance of effects of using of products Cora agrohomeopathie° per sprinkling program	
Hop spider mite (<i>Tetranychus urticae</i>)			Development of plants in the growing season	Crop: quality (undamaged corns) and quantity /Comparison with the average harvest of the year in Slovenia
Hop flea beetle (<i>Psylliodes attenuatus Koch</i>)			Development of plants in the growing season	Crop: quality (undamaged corns) and quantity /Comparison with the average harvest of the year in Slovenia
Damson Hop Aphid (<i>Phorodon humuli</i>)			Development of plants in the growing season	Crop: quality (undamaged corns) and quantity /Comparison with the average harvest of the year in Slovenia
	Hop Powdery Mildew (<i>Sphaerotheca macularis</i>)			Crop: quality (undamaged corns) and quantity /Comparison with the average harvest of the year in Slovenia
	Hop Downy Mildew (Pseudoperonospora humuli)			Crop: quality (undamaged corns) and quantity /Comparison with the average harvest of the year in Slovenia
		Drought		Crop: quality (undamaged corns, the content of alpha acids in corns) and quantity /Comparison with the average harvest of the year in Slovenia
		Too much precipitation		Crop: quality (undamaged corns, the content of alpha acids in corns) and quantity /Comparison with the average harvest of the year in Slovenia
		Wind, hail		Injuries of hops plants due to wind. The regenerative ability of plants to injure.

Hops and drought 2013, Page 1

Sources:

(1) Research article Hop (*Humulus lupulus* L.) response mechanisms in drought stress:

Proteomic analysis with physiology Zala Kolenc,^a Dominik Vodnik,^b Stanislav Mandelc,^b Branka Javornik,^b Damijana Kastelec,^b Andreja Čerenak,
Slovenian Institute of Hop Research and Brewing, Cesta Žalskega tabora 2, SI-3310, Žalec, Slovenia ^b Agronomy Department, Biotechnical Faculty, University of Ljubljana, Jamnikarjeva 101, SI-1000, Ljubljana, Slovenia

(2) Kontingenca suše, Ranljivostna ocena kmetijske suše v Sloveniji
(Contingency drought, Vulnerability assessment Agricultural drought in Slovenia),

Andreja Sušnik,
Agencija RS za okolje (Environmental Agency of the Republic of Slovenia)

- Changes in temperature, atmospheric carbon dioxide (CO₂), and the frequency and intensity of extreme weather could have significant impacts on crop yields.
- For any particular crop, the effect of increased temperature will depend on the crop's optimal temperature for growth and reproduction.
- In some areas, warming may benefit the types of crops that are typically planted there, or allow farmers to shift to crops that are currently grown in warmer areas. to crops that are currently grown in warmer areas. Conversely, if the higher temperature exceeds a crop's optimum temperature, yields will decline.

- So in the world as well as with us yet there is always not a general and the most objectively definition. One of them is definitions of agricultural drought:
- “Insufficient amount of water in the soil necessary for normal development agricultural plants.” (2)
- “Represents a combination of meteorological and hydrological droughts, and when occurring in a time of intense growth and development of agricultural plants, i.e. in critical phenological - developmental periods, is the crop is reduced or even completely destroyed". (2)

Hop and drought 2013, Page 2

Sources:

(1) Research article Hop (*Humulus lupulus* L.) response mechanisms in drought stress:

Proteomic analysis with physiology Zala Kolenc,^a Dominik Vodnik,^b Stanislav Mandelc,^b Branka Javornik,^b Damijana Kastelec,^b Andreja Čerenak,
Slovenian Institute of Hop Research and Brewing, Cesta Žalskega tabora 2, SI-3310, Žalec, Slovenia ^b Agronomy Department, Biotechnical Faculty, University of Ljubljana, Jamnikarjeva 101, SI-1000, Ljubljana, Slovenia

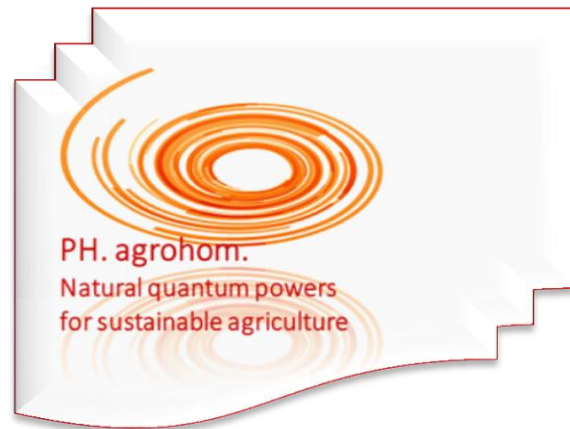
(2) Kontingenca suše, Ranljivostna ocena kmetijske suše v Sloveniji
(Contingency drought, Vulnerability assessment Agricultural drought in Slovenia),

Andreja Sušnik,

Agencija RS za okolje (Environmental Agency of the Republic of Slovenia)

- During growing season 2013, severe drought occurred in Slovenia, so in order to better understand some scientific data relating to hops in drought condition is needed to take into account by presented and receiving data about this project.
- Drought is one of the major environmental devastating stressors that impair the growth and productivity of crop plants. (1)
- Despite the relevance of drought stress, changes in physiology and resistance mechanisms are not completely understood for certain crops, including hop (*Humulus lupulus* L.). (1)
- **In research from source (1), the drought response of hop was studied using a conventional physiological approach (gas exchange techniques, fluorescence, relative water content measurements) and proteomic analysis (2D-DIGE). (1)**
- Plants of two cultivars (Aurora and Savinjski golding) were exposed to progressive drought in a pot experiment and analysed at different stress stages (mild, moderate and severe). (1)
- **Measurements of relative water content revealed a hydrostable water balance of hop. (1)**
- **Photosynthesis was decreased due to stomatal and non-stomatal limitation to the same extent in both cultivars. Of 28 identified differentially abundant proteins, the majority were down regulated and included in photosynthetic (41%) and sugar metabolism (33%). Fifteen % of identified proteins were classified into the nitrogen metabolism, 4% were related to a ROS related pathway and 7% to other functions. (1)**

APPLICATIVE RESEARCH PROJECT:
Effectiveness of the product
Cora agrohomeopathie X62
in case of drought and high temperatures in growing seasons :
Successful & efficient strengthening of agricultural plants and crops
on their ability to adapt to Climate Change – to the conditions of drought



COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEODYNAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS.
MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

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The Project materials are collected, edited and issued in this form in 2018

I.4 Implementation of hop field trials:

- Implementation of Program execution, [link](#)
- Weather and climate conditions, [link](#)
- Implementation of spraying program, [link](#)
- Implementation of monitorings and tests, [link](#)
- Results, [link](#)

Field trials - testimonials - Good practice case: producing hops per program Cora agrohomeopathie®, with products Cora agrohomeopathie®, by farmer: Šlander, sort of hop: Aurora, year 2013

Source of photo: photo archive ing.Majda Ortan



**Weather and agrometeorological characteristic of the season 2013:
EXTREMELY HOT AND DRY YEAR! SEVERE DROUGHT, second worst in last
50 years in Slovenia!**

IMPORTANT:

Hop in our testimonials area were not watered or irrigated!



**Natural disaster was declared in Slovenia in 2013
due to the drought. Temperatures, precepitations:**

[under link](#)

Performance: Implementation hop fields trials execution Program, 2013

Source:

(1) Project Report Material for Article – Mag. Marko Zmrzлак, Hmeza d.o.o., Dr. Magda Rak – Cizej, Slovenian Institute for hop research and brewing, Štefan Šlander;

1. The field trial was performed in real hops growing field condition in the full-fledged plantation of hop variety Aurora, in Grajska vas, in hops plantation from farmer Mr. Štefan Šlander. (1)
2. The ground in the plot is an eccentric eutric brown on loamy alluvium. (1)
3. The hopper was not irrigated, despite to several drought, which was reason for the official announcement of a natural disaster in the Republic of Slovenia in 2013. (1)
5. The supply of the hop plant was carried out in accordance with the guidelines for integrated production, and the measures for the protection of plants and the measures for the protection of hops plants against diseases and pests, were replaced by spraying with natural, energized products Cora agrohomoepathie®. (1)
6. When choosing a variety of hop, we acted in the same way that we would with the guidelines in organic farming. (1)
7. Spraying of hop trials surface, was implemented per comprehensive spraying program, for hops growing with products Cora agrohomoepathie®. (1).
8. We split the trial parcel for use of products Cora agrohomoepathie® in two parts to spray hops with the same products Cora agrohomoepathie® but on different time for second spraying cycle. (1)
9. On first part of parcel were first two days of second treatments performed after the second hop installation on support wires (at a height of about 2 m), and third day of spraying after 14 days from the first spraying. (1)
10. On second part of parcel were first two days of second spraying cycle also performed after the second hop installation on supporting wires (at a height of about 2 m), but the third day of this spraying cycle was performed on start of phases flowering hops (BBCH 61). (1)

Performance: Implementation hop fields trials execution Program, 2013

Source:

(1) Material for Article – Mag. Marko Zmrzlak, Hmezd exim d.d., Dr. Magda Rak – Cizej, Slovenian Institute for hop research and brewing, Štefan Šlander;

11. The control parcel represented a part of the hatchery where we did not use any plant protection products. In addition, we tested a standard systemic insecticide for the protection of hop apiary, by a.s. imidacloprid (Confidor 200 SL) and a.s. flonicamide (Teppeki). (1)
12. All the sprays were made with usual regular sprayer, which was before spraying washed well with clean water. The use of systemic insecticides was at a time, when most of the shoots reached 70% of the height of the wire support (BBCH 37), and the individual shoots as well as the top of the wire support (BBCH 39). (1)
13. The dates on which they were spraying carried out, together with the consumption of water for the preparations of the spray and the doses of products Cora agrohomoopathie® and standard insecticides, were recorded.
14. Monitorings were performed accordingly to prescriptions * noted in spreadsheets 7 and 8. (1)
15. *During performance of monitorings, needed decision was made to adapt Modes of monitoring/evaluating of pests on hops trial plantation sprayed with products Cora agrohomoopathie, while was clear, that by operation of the products
Cora agrohomoopathie® on plants another plants mechanisms are active as by using of pesticides . (1)
16. Any difference was not found out in comparison of results of performances described in points 9. in 10. (1)
17. Weather and agrometeorological data were monitored from official sources (meteo.si, ARSO). Monitored was natural disasters due to the weather. Those collected data was added to the Project testing trials Report in the form of spreadsheets, graphs and statements . (1)

Performance of Monitoring of experimental parameters

Source:

(1) Project Reports-Material for Article – Mag. MarkoZmrzlak, Hmezad exim d.d., Dr. Magda Rak – Cizej, Slovenian Institute for hop research and brewing, Štefan Šlander;

- Occurrence of hop aphids was assessed by standardized method. (EPPO) and by monitored as well as occurrence of symptoms/damage on hop plants and cones, typical causes by hop.
- The cones were controled per quality by monitoring on fields trial surfaces per standard criteria.
- Phenological development of hop plants was monitored.
- The emergence of aphids was monitored as well as occurrence of damage on hopplants and cones, typical causes by aphids.
- The emergence of hop flea beetle was monitored as well as occurrence of damage on hopplants and cones, typical causes by hop flea beetle.
- The emergence of hop spider mite was monitored as well as occurrence of damage on hopplants and cones, typical causes by hop spider mite.
- The emergence of Hop Powdery Mildew was monitored as well as occurrence of symptoms/damage on hopplants and cones, typical causes by Hop Powdery Mildew .
- The emergence of hop Downy Mildew was monitored as well as occurrence of symptoms/damage on hop plants and cones, typical causes by Hop Downy Mildew.
- The emergence of hail was monitored by fact events. If event of hail occurred, should be checked occurrence of symptoms/damage on hop plants and cones, typical causes by hail.
- The emergence of strong wind was monitored by fact events. If event of strong wind occurred, should be checked occurrence of symptoms/damage on hop plants and cones, typical causes by strong wind.
- The emergence of drought was monitored by fact events. If event of drought occurred, should be checked occurrence of symptoms/damage on hop plants and cones, typical causes by drought. Climate and weather data were monitored by meteo and ARSO information.
- The emergence of precipitation was monitored by fact events. If event of too much precipitation occurred, should be checked occurrence of symptoms/damage on hop plants and cones, typical causes by too much of precipitation.. Climate and weather data were monitored by meteo and ARSO information.
- The content of alpha-acids in hop cones was analyzed by standardized method (EBC).
- The yield was weighed and conversion to the amount of yield per hectare.

Field trials - testimonials - Good practice case: producing hops per program Cora agrohomeopathie®, with products Cora agrohomeopathie®, by farmer: Šlander, sort of hop: Aurora, year 2013

Source of photo: photo archive ing.Majda Ortan

I.4 Implementation of hop field trials with spraying hop fields with products Cora agrohomeopathie®:

- **IMPLEMENTATION OF SPRAYING PROGRAM, [link](#)**
- **WEATHER CONDITIONS DURING GROWING SEASON 2013, [link](#)**
- **RESULTS OF MONITORING OF DISEASES, PESTS, [link](#)**
- **RESULTS OF MONITORING OF PHENOLOGICAL DEVELOPMENT OF PLANTS OF HOPS ON FIELD TRIALS, Variety Aurora, year 2013, [link](#)**
- **RESULTS ON YIELD, [link](#)**
- **ABSTRACT / SUMMARY, [link](#)**

I.4 Implementation of hop field trials with spraying hop fields
with products Cora agrohomeopathie®:

RESULTS OF MONITORING OF PHENOLOGICAL DEVELOPMENT OF PLANTS OF HOPS ON FIELD TRIALS, Variety Aurora, year 2013

Source: (1) Material for Article – Mag. Marko Zmrzlak, Hmezd exim d.d., Dr. Magda Rak – Cizej, Slovenian Institute for hop research and brewing, Štefan Šlander;

(2) Determination of the phenophases for column 3 of spreadsheet below – Janko Rode, Doctor of biological sciences, University graduated biologist, Master of Science, Virin s.p. email archiv Majda Ortan, ing. PH. Agrohom.;

1.Date of observation – monitoring of development of hops, hops field trials, Aurora, 013	2. Monitoring findings	3.Determination of the phenophases per BBCH (2), *
14. 4. 013	Hops cut due to adverse weather conditions was made late, on 14.4.013 (1)	01
13.5.013	In the middle of May (13th of May 013), the plants reached height from 80 cm to 120 cm (1)	31 - 32
4. 6. 013	At the beginning of June (4.6.013), the main shoots reached a third of the height of the wires support. (1)	33
27. 6. 013	By the end of June (27 June 013), individual plants have already reached the top of the wires support (1)	
27.6.013	At the end of June (27.06.013), the first blossoms nets were also formed. (1)	61
10. 7. 013	At the end of the first decade of July (10 July 013), most of the plants were at the top of the support, and individual shoots even overgrown them! (1)	38
10.7.013	On July 10, the plants had formed side shoots, about 30 cm long (1)	23
10.7.018	On July 10 individual flowers were opened (1)	61
16.7.2013	On 16 July 013 full flowering occurred (1)	65
25.7.2013	25.7.013, blossoms began to develop in the cones in the lower part of the hops plants (1)	71-75
The monitoring of technological maturity of cones was not the object of the tests field trials in hops. The content of alpha acids and visual quality of cones, were tested in cones yield in air dry cones.		
6.9.013	Hops was harvested on 6th of September 013 (1)	

By using Source (1), determination of the phenophases per BBCH from column 3, were also made by Janko Rode, Doctor of biological sciences, University graduated biologist, Virin s.p. (2)

RESULTS ON YIELD ;

RESULTS	Harvested amount on 0,55 ha our trials hop –fields , sprayed with products Cora agrohomoepathie®; in tons	Recalculated harvested yield on 1 ha; surface; in tons/ha	Rating: Our result/ average result of Slovenian hop harvested in 2013
YIELD, harvested 6th of september,2013			
YIELD – HOP CONES, Aurora, QUANTITY :	0,650 tons	1,182 tons/ha NOTE:Grown in severe drought, summer hit,growing surfaces was not irrigated, not watered!	0,9966 = 99,7%
YIELD – HOP CONES, Aurora, QUALITY:	Score after visual inspection of cones	Estimation of economic damage caused by damage of cones becouse pests, diseases, drought, heat	Average result of Slovenian hop harvested in 2013 taking into account hop crop from irrigated or watered hop fields.
Hop Downy Mildew (Pseudoperonospora humuli)	Cones are health, without injuries caused by Hop Downy Mildew (Pseudoperonospora humuli) ,also without any other injuries and without any signs of diseases.	NO economic damage, cones are of good quaility	
Hop Powdewry Mildew (Sphaerotheca macularis)	Cones are health, without injuries caused by Hop Powdewry Mildew (Sphaerotheca macularis),also without any other injuries and without any signs of diseases.	NO economic damage, cones are of good quaility	
Hop spider mite (Tetranychus urticae)	Cones are health, without injuries caused by Hop spider mite (Tetranychus urticae),also without any other injuries and without any signs of diseases.	NO economic damage, cones are of good quaility	
Hop flea beetle (Psylliodes punctulatus Koch)	Cones are health, without injuries caused by Hop flea beetle (Psylliodes punctulatus Koch),also without any other injuries and without any signs of diseases.	NO economic damage, cones are of good quaility	
Hop Aphid (Phorodon humuli)	Cones are health, without injuries caused by Hop Aphid (Phorodon humuli) ,also without any other injuries and without any signs of diseases.	NO economic damage, cones are of good quaility	
Drought, heat	Cones are health, without visible damage from drought,heat		
Alpha acid acid content in air dry cones	Content of Alpha acid acid in air dry cones; in %		
	7,4 %		1,2298 = 122,98%

APPLICATIVE RESEARCH PROJECT:
Effectiveness of the product Cora agrohomeopathie X62
in case of drought and high temperatures in growing seasons
ABSTRACT / SUMMARY-1st part of the Project

Sources: (1)Project Reports-Material for Article – Dr. MarkoZmrzlak, Hmezad exim d.d., Dr. Magda Rak – Cizej, Slovenian Institute for hop research and brewing, Štefan Šlander);
(2) Majda Ortan,ing. PH. Agroh., Archive of records and posts

- 2013- severe drought in Slovenia and demanding growing circumstances for hop, due to the weather circumstances.
- Due to severe drought in 2013, natural disaster was proclaimed in Slovenia.
- Many longer lasting heat waves with maximal temperatures around 38° Celsius.
- **On not irrigated and not watered field trials surface**, instead of pesticides were used natural energized, homeodynamic products Cora agrohomeopathie® (with products codes C1,C2, X66, X62). With these products, a comprehensive spraying program has been developed, to enhance the vitality and indirectly, through the vitality of the hops, also to enhance the resistance of the hops to:
 1. Hop Downy Mildew (*Pseudoperonospora humuli*)
 2. Hop Powdewry Mildew (*Sphaerotheca macularis*)
 3. Hop spider mite (*Tetranychus urticae*)
 4. Hop flea beetle (*Psylliodes punctulatus Koch*)
 5. Hop Aphid (*Phorodon humuli*)
 6. Drought, heat /Adaptability to weather and climate change

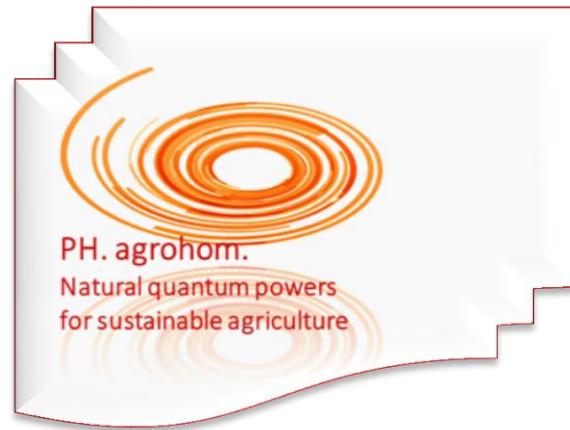
1. YIELD Per Quantity:

- In the professional agronomically testing of Cora agrohomeopathie® products under real production conditions in hop test trials in 2013, despite to the very demanding production conditions due to drought and on not irrigated experimental hops plots, almost the same yield of hops was produced in terms of quantity, as was the average of the year of the same variety **(on testing hop areas was harvested 99,62% of the average yield of variety Aurora in 2013 in Slovenia, whereby the crop of hop taken into account for average harvest for 2013 in Slovenia, was grown on irrigated, watered fields.**

2. YIELD Per Quality:

- In terms of quality (the content of alpha acids in air dry cones), the hops produced on the test surfaces stated previously, **were much better since it had 26,32% higher content of the alpha acids in air dry hop cones** than was the alpha acids content in air dry cones for the average crop of the year 2013 of the same variety (Aurora) in Slovenia.
- Also **cones harvested on tests hop trials**, sprayed with products Cora agrohomeopathie® (with products codes C1,C2, X66, X62).**were health, without damages due to diseases, pests, drought, heat.**
- **Test surfaces were not irrigated, not watered.** Comparative average values for quality and quantity of Slovenian hops yield variety Aurora from 2013, were from hop fields, which were irrigated and/or watered.
- **During whole growing season hop plants from our test fields** of hop sprayed with products Coraagrohomeopathie® **were in good condition during the whole growing season and despite stressful growth conditions** (drought, high temperatures, heat waves), **“developed unusually normally.” (1)→ This was explored in Part 2 of the Project and is presented in continue!**

APPLICATIVE RESEARCH PROJECT:
Effectiveness of the product
Cora agrohomeopathie X62
in case of drought and high temperatures in growing seasons
Successful & efficient strengthening of agricultural plants and crops
on their ability to adapt to Climate Change – to the conditions of drought



COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEODYNAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS.
 MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

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PART II. OF THE PROJECT:

Expose of evaluating effectiveness of product Cora agrohomeopathie X62 in field trial of hop growing (2013) –without irrigation / watering in severe drought and heat condition

Content

II.1.

The reason for the expose of evaluating effectiveness of product Cora agrohomeopathie X62; [link](#)

II.5.

Results, (link)
 * NOTE: Test Results are from first part of the projects [\(link\)](#)

II. 2

Abstract, Summary, conclusion; [link](#)

II.6.

Comparisons of scientific findings and monitorings results with monitoring and tests results of hops from hops field trials, where on variety Aurora product Cora agrohomeopathie X62 was used on not irrigated hop fields in 2013; [link](#)

II.3

Methods; [link](#)

II.7= II.2

Abstract, Summary, conclusion, [link](#)

II.4

Content of published posts:

1. Weather circumstances 2013 March – August):
 •Temperatures, precipitation, drought; [link](#)
 •Long terms observation – weather circumstances effect to the growing of hop and to the cones yield; Kf factor; [link](#)
2. Results of Slovenian Institute for hops research and breeding from their irrigated hops fields: monitorings of hops development per BBCH scale, Quantity of yield, content of alpha acids in harvested hops cones; hop Variety Aurora, field location: Savinjska valey, year 2013; [link](#)

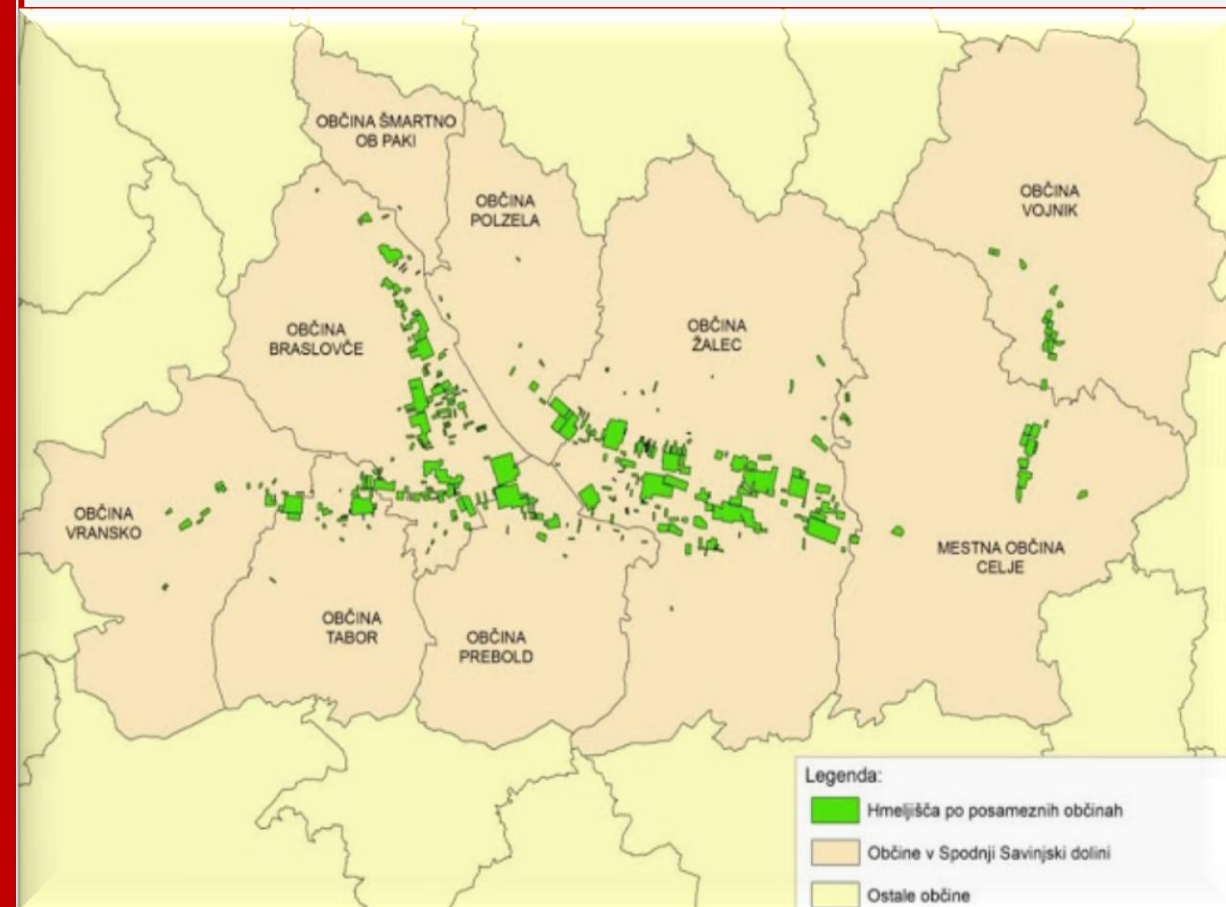
APPLICATIVE RESEARCH PROJECT:
Effectiveness of the product
Cora agrohomoepathie X62 in case of drought and high temperatures in growing seasons
The reason for the expose of evaluating
effectiveness of product Cora agrohomoepathie X62,
the purpose for this, the working hypothesis.

II.1

The reason for the expose comparisons and evaluating of effectiveness of product Cora agrohomoepathie X62

- Since 2012 we got from customers many good feed back regarding effectiveness of products Cora agrohomoepathie ® (and also product Cora agrohomoepathie X62).
- Also expertss, which in 2013 observing hop field trials , pointed out, that hops in our experiments developed an unusually normal, although it was not watered, despite the severe drought, heat and longer heat waves.
- The yield from our trial area was compared with the quality and quality of the Aurora variety from growing season of 2013 in Slovenia.
- As our trial areas were close to the Institute for Hop Growing and Brewing of Slovenia, our results were also compared with their results for the Aurora variety produced in 2013. Thus, we also provided a relevant comparison of the two crops grown under the same conditions (weather , climatic conditions). The hops were not irrigated on our experimental surfaces and were produced without the use of pesticides. The hops on the experimental surfaces of Institute for Hop Growing and Brewing of Slovenia ,have been irrigated and grown by using pesticides.

Hop growing plantation (green surfaces) in down Savinjska Valey.



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Abstract, Summary, Conclusion



COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEODYNAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS. MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

II.2 and II.7

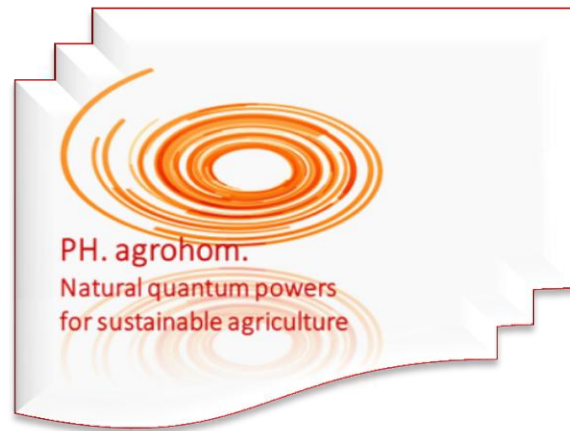
Abstract, Summary, Conclusion, [link](#)

[\(given under link only\)!](#)

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COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEODYNAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS.
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II.3

Methods: [link](#)

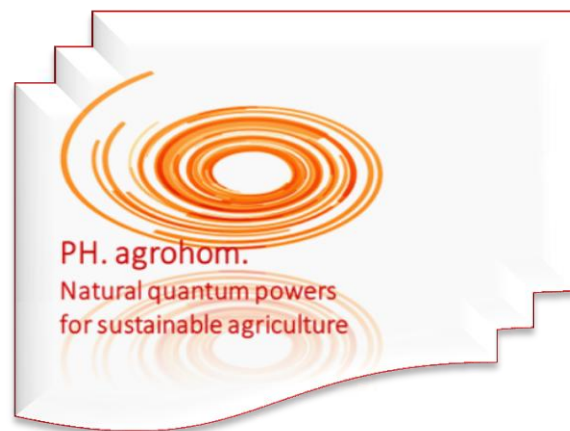
Methods (content):

- **Monitoring methods & evaluation criteria for tested hops growing plantations, where products Cora agrohomeopathie® in growing season 2013 have been used instead of pesticides**
- **Phenological growth stages and BBCH-identification keys of hop**
Hop Rossbauer et al., 1995, (*Humulus lupulus* L.)
- **Finally selected methods / Modes of monitoring hops trial plantations**
- **Factor Kf, per source (1):**

Source: (1)Tone Wagner: Vpliv temperatur in padavin na proizvodnjo hmelja, (1. Jugoslovanski Kongres o hmelju, IHPS); / Tone Wagner: Influence of temperatures and precipitation on the production of hops, (1st Yugoslav congress on hops), Slovenian Institute for hop research and brewing,; Tone Wagner, prof. dr., Slovenian Institute for hop research and brewing; http://www.testing.smd.smd.v-izdelavi.si/data/Arhiv_razprave_papers/razprave/po_avtorjih/Tone%20Wagner/simpozij_75_3_251-260.pdf

- Comparisons, results, evaluating of comparative monitorings and testings results with monitoring and tests results of hops from hops field trials, where on variety Aurora product Cora agrohomeopathie X62 was used on not irrigated hop fields in 2013.

APPLICATIVE RESEARCH PROJECT:
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COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEODYNAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS. MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

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II.4 Content of published posts

1.

- Data/ documentation

of products Cora agrohhomeopathie X62,; [link](#)

-Weather circumstances 2013 (March – August):

Temperatures, precipitation, drought; [link](#)

-Long terms observation – weather circumstances effect

to the growing of hop and to the cones yield; , Kf factor; [Link](#)

II.4 Content of published posts

2.

-DATA from Slovenian Institute for Hops

- Research and Breeding for irrigated and non irrigated hops fields from Slovenian hop, 2013 and for their irrigated hops fields: [link](#)
- Monitorings of hops development per BBCH scale, quantity of yield, content of alpha acids in harvested hops cones; hop variety Aurora, field location: Savinjska valley, year 2013; [link](#)

-Results of Slovenian Institute for hops research and breeding from their irrigated hops fields: monitorings Of hops development per BBCH scale, quantity of yield, content of alpha acids in harvested hops cones; hop Variety Aurora, field location: Savinjska valley, year 2013; [link](#)

Data/ documentation of product Cora agrohhomeopathie X62

Source:
Product's Cora agrohhomeopathie® documentation – PH. Agroh., Ing. Majda Ortan s.p. ;

Products Cora agrohomeopathie® Code	Product's Specification Data Sheet	Safety Data Sheet (ethanol, 43% m/m)	Product's Label
<u>X62</u>	<u>Product's X62 Specification Data Sheet</u>	<u>Safety data sheet for ethanol 43% m/m, according to Regulation (EC) No. 2015/830/EU</u>	<u>LABEL – for product X62</u>

For hop trials 2013 on surfaces sprayed with product Cora agrohomoepathie X62:
Data for Average monthly temperatures, monthly percipitation and monthly Kf
AND COMPARISON
with data from spreadsheets 18 and [spreadsheet 13](#)

For hop trials 2013 on surfaces sprayed with product Cora agrohomoepathie X62: Data for average monthly temperatures, monthly percipitation and monthly Kf AND COMPARISON with data from spreadsheets 18 and 13
Spreadsheet 17

Month in year 2013	Average monthly temperature 2013, (°C)	Percipitation 2013 (mm)	Quocient Kf (2013)
March	2,7	201	74,4
April	11,6	80	6,89
May	14,5	203	14
June	18,7	76	4,06
July	21,7	47	2,16
Avgust	20,6	102	4,95

HARVEST:	1.182kg/ha, 1057 kg/ha <1.182 kg/ha<1321kg/ha<1833kg/ha
----------	--

Comparision with data from spreadsheets 18 and [spreadsheet 13](#)

Month	Quocients Kf	Average temperatures, (°C)	Percipita-tions (mm)
April	6,89<9,8 6,89<10,4	10,4<11,6>9,8	201>101,9 201>101,8
Maj	14>9,8 14>6,5	14,1<15,5<15,7	203>137,7 203>101,5
June	4,06<7,4 4,06<7,5	18,2<18,7<18,8	76<137,4 76<135,5
July	2,16<6,6	21,7>19,5 21,7>20,1	47<129,2 47<133
August	4,95<6,6 4,95<5,7	20,6>18,8 20,6>19,2	102<120,8 102<109,7

Quotient Kf: Monthly sume of precipitation/average sume of temperatures during the month in relation with yield fertile years and yield poor years, for hops plants,Field location of Slovenian Institute for hop research and brewing, years : 1956 – 1973; (1)
Spreadsheet 18

Month	Kf for years with an above-average yield	Kf for Years with a lower average yield
April	9,8	10,4
May	9,8	6,5
June	7,4	7,5
July	6,6	6,6
Avgust	6,8	5,7
AVERAGE HARVEST	1.574 kg per ha Maximum: 1.838 kg/ha	1321 kg / ha Minimum: 1057kg / ha

Weather conditions of fertile years (with abudance crops, years with an above-average yield) and of years with poor crops (Years with a lower average yield)for Hops plants,Field location of Slovenian Institute for hop research and brewing, years : 1956 – 1973; (1)
[Spreadsheet 13](#)

	Years with an above-average yield		Years with a lower average yield	
Month	Average temperature (°C)	Precipiration (mm)	Average temperature (°C)	Precipiration (mm)
April	10,4	101,9	9,8	101,8
May	14,1	137,7	15,7	101,5
June	18,8	137,4	18,2	135,5
July	19,5	129,2	20,1	133,3
August	18,8	120,8	19,2	109,7

APPLICATIVE RESEARCH PROJECT:
Effectiveness of the product
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II.4 Content of published posts

1.

-Weather circumstances 2013

(March –September):

- Temperatures, [link](#)
- Precipitation, [link](#)
- Drought, [link](#)

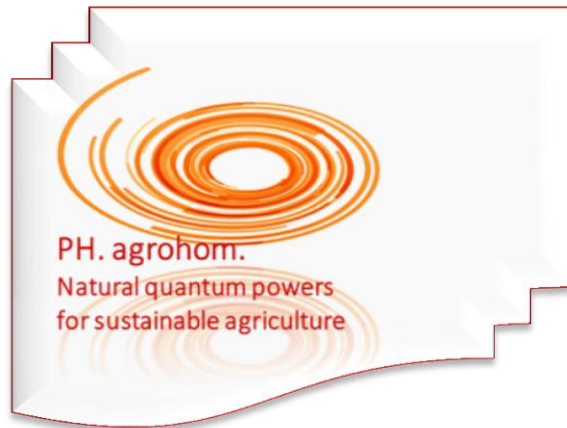
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APPLICATIVE RESEARCH PROJECT:

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Content of published posts

-Long terms observation – weather circumstances effects to the growing of hop and to the cones yield and Kf Factor



COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEODYNAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS.
MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

II.4

Content of published posts

1.

- Long terms observation – weather circumstances effects to the growing of hop and to the cones yield and Kf factor;
[link](#)

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APPLICATIVE RESEARCH PROJECT:
Effectiveness of the product
Cora agrohomoepathie X62 in case of drought and high temperatures in growing seasons
Influence of temperature and precipitation during vegetation on the yield of hops

Source: (1) Tone Wagner: Vpliv temperatur in padavin na proizvodnjo hmelja, (1. Jugoslovanski Kongres o hmelju, IHPS); // Tone Wagner:
Influence of temperatures and precipitation on the production of hops, (1st Yugoslav congress on hops),
Slovenian Institute for hop research and brewing.; Tone Wagner, prof. dr., Slovenian Institute for hop research and brewing; http://www.testing.smd.smd.v-izdelavi.si/data/Arhiv_razprave_papers/razprave/po_avtorjih/Tone%20Wagner/simpozij_75_3_251-260.pdf;

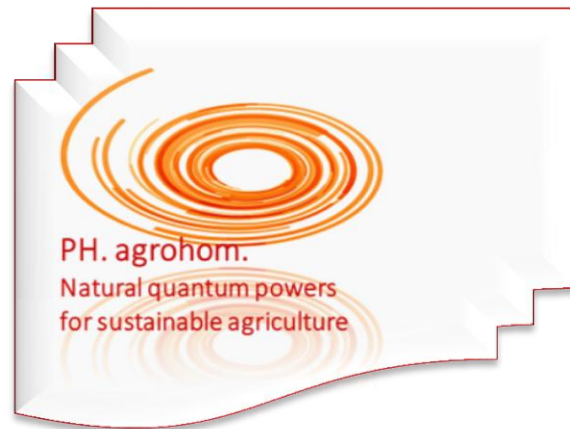
- The amount of hop is harvested isn kg / ha of air dry cones (usually at 11% moisture).
- For the study of the influence of temperatures and precipitation during vegetation on the hops harvest, the selected hops were a typical area of the Savinja valley and weather data of the observation station of the Institute for Hop and Breeding of Slovenia in Zalec.
- The **period from 1956 to 1973** was included in the study.
- The **average yield was 1434 kg / ha**. Years of production were divided into two groups (years with an above-average yield and years with a lower average yield).
- The **average harvest in the fertile years was 1574 kg per ha**.
- The **average harvest of years with poor crops years 1321 kg / ha**.
- The **difference between them is 253 kg / ha, which is 17.6% of the 18-year- average of crop**.
- **Extreme harvest values are 1057kg / ha in 1971 and 1838 kg / ha in 1960**.
- The **variation width is 781 kg / ha, which is 54%**.
- **Thus, the fluctuation of crop over the years is largely due to weather conditions during the vegetation period.**

Weather conditions of fertile years (with abundance crops, Years with an above-average yield) and of years with poor crops (Years with a lower average yield)

for Hops plants, from Field locations of Slovenian Institute for hop research and brewing, years : 1956 – 1973; (1)

	Years with an above-average yield		Years with a lower average yield	
Month	Average temperature (°C)	Precipitation (mm)	Average temperature (°C)	Precipitation (mm)
April	10,4	101,9	9,8	101,8
May	14,1	137,7	15,7	101,5
June	18,8	137,4	18,2	135,5
July	19,5	129,2	20,1	133,3
August	18,8	120,8	19,2	109,7

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II.4 Content of published posts

2.

- DATA from Slovenian Institute for Hop Research and Breeding for irrigated and non irrigated hops fields from Slovenian hop, 2013 and for their irrigated hops fields; [link](#), [link](#)
- Monitorings of hop development per BBCH scale, quantity of yield, content of alpha acids in harvested hops cones; hop variety Aurora, field location: Savinjska valey, year 2013; [link](#)

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APPLICATIVE RESEARCH PROJECT:
Effectiveness of the product Cora agrohomeopathie X62 in case of drought and high temperatures in growing seasons
Data from Slovenian Institute of hop research and brewing

- **Table: Development phase hop in 2013(date of commencement of the development phase) at a location IHPS**, SOURCE: Slovenian Institute for hop in brewing (IHPS), Archiv for year 2013: link: <http://cora-agrohomeopathie.com/en/wp-content/uploads/sites/3/2019/08/razvojne-faze-2013.pdf>
- **Hop in drought;** (1) Research article Hop (*Humulus lupulus* L.) response mechanisms in drought stress: Proteomic analysis with physiology Zala Kolenc,^a Dominik Vodnik,^b Stanislav Mandelc,^b Branka Javornik, Damijana Kastelec,^b Andreja Čerenak, Slovenian Institute of Hop Research and Brewing, Cesta Žalskega tabora 2, SI3310, Žalec, Slovenia ^b Agronomy Department, Biotechnical Faculty, University of Ljubljana, Jamnikarjeva 101, SI-1000, Ljubljana, Slovenia (2) Kontingenca suše, Ranljivostna ocena kmetijske suše v Sloveniji (Contingency drought,Vulnerability assessment Agricultural drought in Slovenia), Andreja Sušnik, Agencija RS za okolje (Environmental Agency of the Republic of Slovenia); Short extract: [link](#)
- **Impact of growing conditions on the growth and development of hops during the year 2013;** Source: dr. Barbara Čech, Monika Oset Luskar, Gregor Leskošek, Alenka Ferlež Rus , Institute for Hop Growing and Brewing in Slovenia / *Hmeljar, letnik 74 (Institut za hmeljarstvo in pivovarstvo Slovenije / Institute of Hop Research and Brewing of Slovenia)* : **Vpliv rastnih razmer na rast in razvoj hmelja v letu 2013**, by: dr. Barbara Čeh, Monika Oset Luskar, Gregor Leskošek, Alenka Ferlež Rus, Inštitut za hmeljarstvo in pivovarstvo Slovenije. LINK: <http://www.dlib.si/stream/URN:NBN:SI:DOC-1U2PVAHF/f26f12b1-3178-4ff6-a1ca-c357d5df9e82/PDF>
- The Sources were also **my Project Arhiv data**, which include also e mail communication.

I.4 Implementation of hop field trials with spraying hop fields
with products Cora agrohomeopathie®:

RESULTS OF MONITORING OF PHENOLOGICAL DEVELOPMENT OF PLANTS OF HOPS ON FIELD TRIALS, Variety Aurora, year 2013

Source: (1) Material for Article – Mag. Marko Zmrzlak, Hmezd exim d.d., Dr. Magda Rak – Cizej, Slovenian Institute for hop research and brewing, Štefan Šlander;
(2) Determination of the phenophases for column 3 of spreadsheet below – Janko Rode, Doctor of biological sciences, University graduated biologist, Master of Science, Virin s.p. email
archiv Majda Ortan, ing. PH. Agrohorm.;

Spreadsheet 11

1.Date of observation – monitoring of development of hops, hops field trials, Aurora, 013	2. Monitoring findings	3.Determination of the phenophases per BBCH (2),*
14. 4. 013	Hops cut due to adverse weather conditions was made late, on 14.4.013 (1)	01
13.5.013	In the middle of May (13th of May 013), the plants reached height from 80 cm to 120 cm (1)	31 - 32
4. 6. 013	At the beginning of June (4.6.013), the main shoots reached a third of the height of the wires support. (1)	33
27. 6. 013	By the end of June (27 June 013), individual plants have already reached the top of the wires support (1)	
27.6.013	At the end of June (27.06.013), the first blossoms were also formed. (1)	61
10. 7. 013	At the end of the first decade of July (10 July 013), most of the plants were at the top of the support, and individual shoots even overgrown them! (1)	38
10.7.013	On July 10, the plants had formed side shoots, about 30 cm long (1)	23
10.7.018	On July 10 individual flowers were opened (1)	61
16.7.2013	On 16 July 013 full flowering occurred (1)	65
25.7.2013	25.7.013, blossoms began to develop in the cones in the lower part of the hops plants (1)	71-75
The monitoring of technological maturity of cones was not the object of the tests field trials in hop The content of alpha acids and visual quality of cones, were tested in yield in air dry cones.		
6.9.013	Hops was harvested on 6th of September 013 (1)	

By using Source (1), determination of the phenophases per BBCH from column 3, were also made by Janko Rode, Doctor of biological sciences, University graduated biologist, Virin s.p. (2)

COMPARISON AND EVALUATION OF DATA ABOUT PHENOLOGICAL DEVELOPMENT OF HOP from HOPS FIELD TRIAL (2013) with hops of Aurora variety, which was NOT IRRIGATED and was sprayed with product Cora agrohomeopathieX62, with DATA ABOUT PHENOLOGICAL DEVELOPMENT OF HOPS from hops IRRIGATED fields of Slovenian Institute for hops research and brewing, variety Aura, monitored by Slovenian Institute for hops research and brewing, integrated mode of production without use of product Cora agrohomeopathieX62, location Savinjska Valey, year 2013

Legend for spreadsheet below:
I.= date of reaching phenophase specified for hop plants from our field trials, where product Cora agrohomeopathie X62 was used, on not irrigated and not watering hops fields.
Variety of hops Aurora, year 2013;
II. = sume of growing days from cut (from date 14. 4. 013)
III. date of reaching phenophase specified for hop plants from cut (from date 05. 4. 013, on irrigated hop fields of Slovenian Institute for hop researching and brewing, which employees also were controled growing and monitored this hops. Variety of hops: Aurora, year 2013;
IV = sume of growing days from cut (from date 05. 4. 013)
V. : The upper row: the diif erence: V= IV.-II.; V. the bottom row: the value of the difference expressed as a percentage
A: results of phenophasys monitorings from hops fields, where product Cora agrohomeopathie X62 was used, on not irrigated and not watering hops fields.
B: Sources: from previous slides. Spreadsheet 20

- 1.
- 1.
- Spreadsheet: RESULTS OF MONITORONG OF PHENOLOGICAL DEVELOPMENT OF PLANTS
 - OF HOPS ON FIELD TRIALS sprayed with product Cora agrohomeopathieX62, Variety Aurora, year 2013; NOT IRRIGATEDHOP FIELDS: <http://cora-agrohomeopathie.com/en/wpcontent/uploads/sites/3/2018/12/Results-of-monitoring-of-hops-development-per-phenophaseshops-field-trials-2013-Cora-agrohomeopathie-X62.pdf>
 - Sources:
 - (1) Material for Article – Dr. MarkoZmrzlak, Hmezadexim d.d., Dr. Magda Rak – Cizej, Slovenian Institute for hop research and brewing, Štefan Šlander;
 - (2) Determination of the phenophases for column 3 of spreadsheet below – Janko Rode, Doctor of biological sciences, University graduated biologist, Virin s.p. email archiv Majda Ortan, ing. PH. Agroh. ; Spreadsheet 11
- 2.
- Spreadsheet: DEVELOPMENT PHASES (PHENOPHASES – DATES OF OCCURING) IN HOPS-AURORA IN 2013 ON LOCATION OF SLOVENIAN INSTITUTE FOR HOPS AND BREWING; IRRIGATED HOP FIELDS: <http://cora-agrohomeopathie.com/en/wpcontent/uploads/sites/3/2018/12/2013-razvojne-fazeAUrora-ihps.pdf> Sorce: Archive of Slovenian Institute for hops and brewing; Spreadsheed nr. 20

Description of phenophaze	BBCH	A		B		V. (V.=IV. -II.)
		I.	II.	III.	IV.	Value of the difference expressed as a percentage and comments
Dormancy: rootstock without shoots (cut)	01	14. 4. 013		5.4.013		
Emergence: first shoots emerge at the soil surface	09			9.4.012		
2nd pair of leaves unfolded	12			30.4.013		
Bines have reached 10%-20% of top wire height	31-32	13.5. 013				
Bines have reached 30% of top wire height	33	4.6. 013	51	29.5.013	54	3; II. is faster for 5,56%
Some plants reached top of wires.		27.6.013				
Inflorescence buds visible	51	27.6.013	74	21.6.013	77	3; II. is faster for 3,89%
Inflorescence buds enlarged	55	27.6.018	74	21.6.013	77	3; II. is faster for 3,89%
Plants have reached the top wire, (*some of them even overreached top of wires)	38	*10.7.013	*87	28.6.013	84	-3; II. is slower for 3,57%
Visible site shoots, long about 30 cm	22-23	10.7.013				
Beginning of flowering: about 10% of flowers open	61	10.7. 013	87	7.7.013	93	6; II. is faster for 6,45%
Full flowering: about 50% of flowers open	65	16.7. 013	93	12.7.013	98	5; II. is faster for 5,11%
Beginning of cone development: 10% of inflorescences are cones - cone development on half way: all cones visible, cones soft, stigmas still present	71-75	25.7.018				
Cone development complete: nearly all cones have reached full size	79			8.8.013		

Summary Spreadsheet of results of Content of alpha acids in hops cones and weather conditions in the phenophases of hop cones making (1); For comparison and evaluation of results from spreadsheet 19, please see spreadsheet 20!
Sources: under Llnk: <http://cora-agrohomeopathie.com/en/wp-content/uploads/sites/3/2019/08/1-SOURCES.pdf>
Items: I, II, III, IV, V

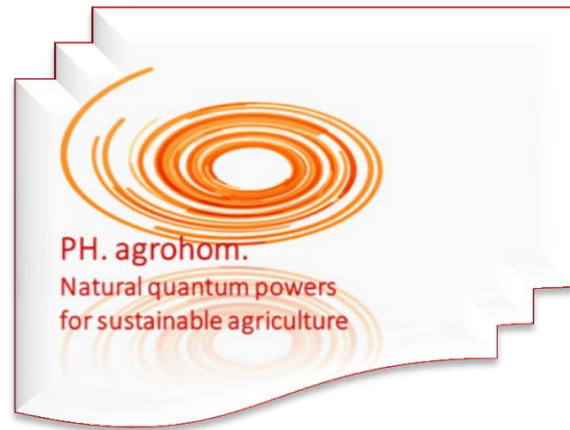
Spreadsheet 19

Year	% alpha acids		Sume of temperatutes (°C)/August 2013	Precipirations (mm)/August 013				
I:2013, trials hop-fields sprayeres with product Cora agrohomeopathie 62 Source: Spreadsheet 12	7,4		608,6	102	Content of alpha acids in hops cones and weather conditions in the phenophases of hop cones making - long term observation (1); Spreadsheet 16			
II.1971 Source: Spreadsheet 16	MIN. % of alpha acids / Spreadsheet 16, year 1971		Sume of temperatutes (°C)/August 1971,Spreadsheet 16	Precipirations (mm)/August 1971, Spreadsheet 16	Year	% alpha acids	Sume of temperatutes (°C)/August	Precipirations (mm)/August
II:1971 Source: Spreadsheet 16	5,6		752	100	1965	6,4	850	136
					1966	6,9	809	195
III, IV:1970, 1974 Source:Spreadsheet 16	MAX. % of alpha acids / Spreadsheet 16, year 1970,year 1974		Sume of temperatutes (°C)/August 1970 (°C)/August 1974	Precipirations (mm)/August 1970, August1974	1967	6,0	851	94
III.:1970, Source: Spreadsheet 16	7,6		690	166	1968	6,9	723	174
III.:1974 Source: Spreadsheet 16	7,6		729	122	1969	7,5	787	254
III: AVERAGE For years 1970, 1974	7,6		709,5	144	1970	7,6	690	166
IV:***:2013,Observation location of Slovenian Institute for hop research and brewing, hops varity Aurora, irrigated hop fields!	MAX. % of alpha acids	MIN. % of alpha acids	Sume of temperatutes (°C)/August 2013	Precipirations (mm)/August 2013	1971	5,6	752	100
	7,4	6,1	608,6	102	1972	7,1	854	302
					1973	5,8	648	82
V:***AVERAGE of Max. and Min.% of alpha acids	6,75		608,6	102	1974	7,6	729	122

APPLICATIVE RESEARCH PROJECT:

Effectiveness of the product Cora agrohomoepathie X62 in case of drought and high temperatures in growing seasons
Successful & efficient strengthening of agricultural plants and crop on their ability to adapt to Climate Change – to the conditions of drought and high temperatures

Results



COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEOIDYNAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS. MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

II.5

Results:

- Phenological development of plants, [link](#)
- Yield, [link](#)
- Comparison and evaluation of results, [link](#)

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II.3

Results:

- Phenological development of plants, [link](#)

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I.4 Implementation of hop field trials with spraying hop fields
with products Cora agrohomeopathie®:

RESULTS OF MONITORING OF PHENOLOGICAL DEVELOPMENT OF PLANTS OF HOPS ON FIELD TRIALS, Variety Aurora, year 2013

Source: (1) Material for Article – Mag. Marko Zmrzlak, Hmezd exim d.d., Dr. Magda Rak – Cizej, Slovenian Institute for hop research and brewing, Štefan Šlander;
(2) Determination of the phenophases for column 3 of spreadsheet below – Janko Rode, Doctor of biological sciences, University graduated biologist, Master of Science, Virin s.p. email
archiv Majda Ortan, ing. PH. Agrohorm.;

Spreadsheet 11

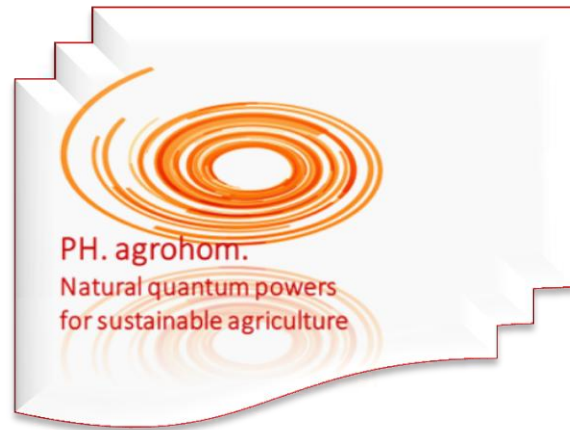
1.Date of observation – monitoring of development of hops, hops field trials, Aurora, 013	2. Monitoring findings	3.Determination of the phenophases per BBCH (2),*
14. 4. 013	Hops cut due to adverse weather conditions was made late, on 14.4.013 (1)	01
13.5.013	In the middle of May (13th of May 013), the plants reached height from 80 cm to 120 cm (1)	31 - 32
4. 6. 013	At the beginning of June (4.6.013), the main shoots reached a third of the height of the wires support. (1)	33
27. 6. 013	By the end of June (27 June 013), individual plants have already reached the top of the wires support (1)	
27.6.013	At the end of June (27.06.013), the first blossoms were also formed. (1)	61
10. 7. 013	At the end of the first decade of July (10 July 013), most of the plants were at the top of the support, and individual shoots even overgrown them! (1)	38
10.7.013	On July 10, the plants had formed side shoots, about 30 cm long (1)	23
10.7.018	On July 10 individual flowers were opened (1)	61
16.7.2013	On 16 July 013 full flowering occurred (1)	65
25.7.2013	25.7.013, blossoms began to develop in the cones in the lower part of the hops plants (1)	71-75
The monitoring of technological maturity of cones was not the object of the tests field trials in hop The content of alpha acids and visual quality of cones, were tested in yield in air dry cones.		
6.9.013	Hops was harvested on 6th of September 013 (1)	

By using Source (1), determination of the phenophases per BBCH from column 3, were also made by Janko Rode, Doctor of biological sciences, University graduated biologist, Virin s.p. (2)

APPLICATIVE RESEARCH PROJECT:

Effectiveness of the product Cora agrohomeopathie X62 in case of drought and high temperatures in growing seasons
Successful & efficient strengthening of agricultural plants and crop on their ability to adapt to Climate Change – to the conditions of drought and high temperatures

Results



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II.3

Results:

- Yield, [link](#)

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RESULTS ON YIELD ;

RESULTS	Harvested amount on 0,55 ha our trials hop –fields , sprayed with products Cora agrohomeopathie®; in tons	Recalculated harvested yield on 1 ha; surface; in tons/ha
YIELD, harvested 6th of september,2013		
YIELD – HOP CONES, Aurora, QUANTITY :	0,650 tons	1,182 tons/ha NOTE:Grown in severe drought, summer hit,growing surfaces was not irrigated, not watered!
YIELD – HOP CONES, Aurora, QUALITY:	Score after visual inspection of cones	Estimation of economic damage caused by damage of cones because pests, diseases, drought, heat
Hop Downy Mildew (Pseudoperonospora humuli)	Cones are health, without injuries caused by Hop Downy Mildew (Pseudoperonospora humuli) ,also without any other injuries and without any signs of diseases.	NO economic damage, cones are of good quaility
Hop Powdewry Mildew (Sphaerotheca macularis)	Cones are health, without injuries caused by Hop Powdewry Mildew (Sphaerotheca macularis),also without any other injuries and without any signs of diseases.	NO economic damage, cones are of good quaility
Hop spider mite (Tetranychus urticae)	Cones are health, without injuries caused by Hop spider mite (Tetranychus urticae),also without any other injuries and without any signs of diseases.	NO economic damage, cones are of good quaility
Hop flea beetle (Psylliodes punctulatus Koch)	Cones are health, without injuries caused by Hop flea beetle (Psylliodes punctulatus Koch),also without any other injuries and without any signs of diseases.	NO economic damage, cones are of good quaility
Hop Aphid (Phorodon humuli)	Cones are health, without injuries caused by Hop Aphid (Phorodon humuli) ,also without any other injuries and without any signs of diseases.	NO economic damage, cones are of good quaility
Drought, heat	Cones are health, without visible damage from drought,heat	
QUALITY: Alpha acid acid content in air dry cones	Content of Alpha acid acid in air dry cones; in %	7,4 %

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Comparison and evaluation of results



COMPREHENSIVE PROGRAM OF PROFESSIONAL, SUSTAINABLE, ENERGIZED (AGRO-HOMEOIDYNAMICS) PRODUCTS FOR PLANTS CARE AND STRENGTHENING VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF ENERGY BALANCE OF SPRAYED ECOSYSTEMS. MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

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II.3

Results:

- Comparison and evaluation of results, [link](#)

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COMPARISON AND EVALUATION OF DATA ABOUT PHENOLOGICAL DEVELOPMENT OF HOP from HOPS FIELD TRIAL (2013) with hops of Aurora variety, which was NOT IRRIGATED and was sprayed with product Cora agrohomeopathieX62, with DATA ABOUT PHENOLOGICAL DEVELOPMENT OF HOPS from hops IRRIGATED fields of Slovenian Institute for hops research and brewing, variety Aura, monitored by Slovenian Institute for hops research and brewing, integrated mode of production without use of product Cora agrohomeopathieX62, location Savinjska Valey, year 2013

Legend for spreadsheet below:
I.= date of reaching phenophase specified for hop plants from our field trials, where product Cora agrohomeopathie X62 was used, on not irrigated and not watering hops fields.
Variety of hops Aurora, year 2013;
II. = sume of growing days from cut (from date 14. 4. 013)
III. date of reaching phenophase specified for hop plants from cut (from date 05. 4. 013, on irrigated hop fields of Slovenian Institute for hop researching and brewing, which employees also were controled growing and monitored this hops. Variety of hops: Aurora, year 2013;
IV = sume of growing days from cut (from date 05. 4. 013)
V. : The upper row: the diif erence: V= IV.-II.; V. the bottom row: the value of the difference expressed as a percentage
A: results of phenophasys monitorings from hops fields, where product Cora agrohomeopathie X62 was used, on not irrigated and not watering hops fields.
B: Sources: from previous slides. Spreadsheet 20

1.
1.
- Spreadsheet: RESULTS OF MONITORONG OF PHENOLOGICAL DEVELOPMENT OF PLANTS

OF HOPS ON FIELD TRIALS sprayed with product Cora agrohomeopathieX62, Variety Aurora, year 2013; NOT IRRIGATEDHOP FIELDS: <http://cora-agrohomeopathie.com/en/wpcontent/uploads/sites/3/2018/12/Results-of-monitoring-of-hops-development-per-phenophaseshops-field-trials-2013-Cora-agrohomeopathie-X62.pdf>
 - Sources:

(1) Material for Article – Dr. MarkoZmrzlak, Hmezadexim d.d., Dr. Magda Rak – Cizej, Slovenian Institute for hop research and brewing, Štefan Šlander;
 - (2) Determination of the phenophases for column 3 of spreadsheet below – Janko Rode, Doctor of biological sciences, University graduated biologist, Virin s.p. email archiv Majda Ortan, ing. PH. Agrohom.; Spreadsheet 11
2.
- Spreadsheet: DEVELOPMENT PHASES (PHENOPHASES – DATES OF OCCURRING) IN HOPS-AURORA IN 2013 ON LOCATION OF SLOVENIAN INSTITUTE FOR HOPS AND BREWING; IRRIGATED HOP FIELDS: <http://cora-agrohomeopathie.com/en/wpcontent/uploads/sites/3/2018/12/2013-razvojne-fazeAUrora-ihps.pdf> Sorce: Archive of Slovenian Institute for hops and brewing; Spreadsheed nr. 20

Description of phenophaze	BBCH	A		B		V. (V.=IV. -II.)
		I.	II.	III.	IV.	Value of the difference expressed as a percentage and comments
Dormancy: rootstock without shoots (cut)	01	14. 4. 013		5.4.013		
Emergence: first shoots emerge at the soil surface	09			9.4.012		
2nd pair of leaves unfolded	12			30.4.013		
Bines have reached 10%-20% of top wire height	31-32	13.5. 013				
Bines have reached 30% of top wire height	33	4.6. 013	51	29.5.013	54	3; II. is faster for 5,56%
Some plants reached top of wires.		27.6 013				
Inflorescence buds visible	51	27.6.013	74	21.6.013	77	3; II. is faster for 3,89%
Inflorescence buds enlarged	55	27.6.018	74	21.6.013	77	3; II. is faster for 3,89%
Plants have reached the top wire, (*some of them even overreached top of wires)	38	*10.7.013	*87	28.6.013	84	-3; II. is slower for 3,57%
Visible site shoots, long about 30 cm	22-23	10.7.013				
Beginning of flowering: about 10% of flowers open	61	10.7. 013	87	7.7.013	93	6; II. is faster for 6,45%
Full flowering: about 50% of flowers open	65	16.7. 013	93	12.7.013	98	5; II. is faster for 5,11%
Beginning of cone development: 10% of inflorescences are cones - cone development on half way: all cones visible, cones soft, stigmas still present	71-75	25.7.018				
Cone development complete: nearly all cones have reached full size	79			8.8.013		

Comparison and Evaluation of data from spreadsheet 19:

Alpha acid contents in hops cones and weather conditions in the phenophases of hop cones making

Compared items from spreadsheet 19	% alpha acids in air dry hop cones			Sume of temperatutes (°C)/August 2013			Precipirations (mm)/August 2013		
Compared item I with item II from spreadsheet 19	7,4 > 5,6 For 32,15% better/higher			608,6<752 For 19,15% lower			102>100 For 2% more		
Compared item I with item III from spreadsheet 19	7,4< 7,6 For 2,64% worse/lower			608<690; For 11,88% lower	608<729; For 16,6% lower	608<709,5 For 14,25% lower	102<166; For 61,44% less	102<122; For 16,3% less	102<144 For 29,16 less
Compared item I with item IV from spreadsheet 19	7,4=7,4; Eaqual	7,4>6,1; For 21,33% better/higher	7,4>6,75 For 9,62% better/higher	608=608 Eauqal			102=102 Eaqual		

Comparison and Evaluation of [data from spreadsheet 19](#):
Alpha acid contents in hops cones and **weather conditions in the phenophases of hop cones making**

- Comparison of trials in hop-fields sprayed with product Cora agrohomoepathie X62 in 2013, with the worst result (1971) from 10 years monitored results (1965-1974):
- Hop cones from trials from hop-fields sprayed with product Cora agrohomoepathie X62 in 2013, had for 32,15% better/higher content of alpha acid. During phenophases of hop cones making (August), in this "our" trials hops fields were for 19,15% lower sum of temperatures and for 2% more precipitation.

- Comparison of trials in hop-fields sprayed with product Cora agrohomoepathie X62 in 2013, with the best result (1970, 1974) from 10 years monitored results (1965-1974):
- Hop cones from trials from hop-fields sprayed with product Cora agrohomoepathie X62 in 2013, had for 2,64 worse/lower content of alpha acid, lower were sum of August temperatures: for 11,88% lower than in year 1970, for 16,16% lower as in year 1974 and for 14,25% lower as is their average. Also are lower precipitation in comparison with August 1970 for 61,44%, with comparison from 1974 for 16,3% and with comparison with average of August 1970 and 1971 are August precipitation in our trials on hop-fields sprayed with product Cora agrohomoepathie X62 in 2013, lower for 29,16%.

- Comparison of: trials from not irrigated hop fields sprayed with product Cora agrohomoepathie X62 in growing season 2013 (1), with results from of Slovenian Institute for hops research and brewing – of their hops monitoring from their irrigated hop fields in 2013 (2). By both ((1), (2)) was grown hop variety Aurora, both ((19), (2)) are on location Savinjska Valley.
- The sum of temperatures was the same, the precipitation was the same. In **comparison of alpha acid content**, are results for hops cones from our hop trials (1) in comparison with results from hops cones from irrigated hops fields of Slovenian Institute for hops research and brewing (2): for their (2) maximum achieved value equal, for their minimal achieved value for 21,23 better, for average values of their results for 9,62% better. (*Slovenian institute for hops research and brewing gave us two values for alpha acids in air dry hops cones regarding to different hop fields*).

- **Conclusion:** hop plants on not irrigated hop fields which were in our hops trials sprayed with products Cora agrohomoepathie X62, in drought and heat gave the same results of content of alpha acid in hops cones, as was achieved as maximum value in hops cones of the same variety (Aurora) from irrigated hops fields owned and monitored of Slovenian Institute for hops research and brewing. It's excellent result which **confirmed good effectiveness of product Cora agrohomoepathie X62 on strengthening vitality and thus implicitly strengthening adaptability of hops plants to the drought and high temperatures, also in the most sensitive phenophases for the quality of the crop.**
- Also in comparison with results from 10 years monitorings, only from two years from those 10 years lasting hops monitoring, hop cones from years 1970 and 1974 had for 2,64 % better results (and another weather conditions, which included from 29,16% to 61,44% more precipitation in phenophases, when hops making cones) as hop cones from hop plants from not irrigated hop fields, which were in our hops trials in growing season 2013 sprayed with products Cora agrohomoepathie X62.

APPLICATIVE RESEARCH PROJECT:
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Abstract, Summary, Conclusion



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II.2 and II.7

Abstract, Summary, Conclusion, [link](#)

[\(given under link only\)!](#)

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[Under link: More short information about some exposed good practices with our products without active substances](#)

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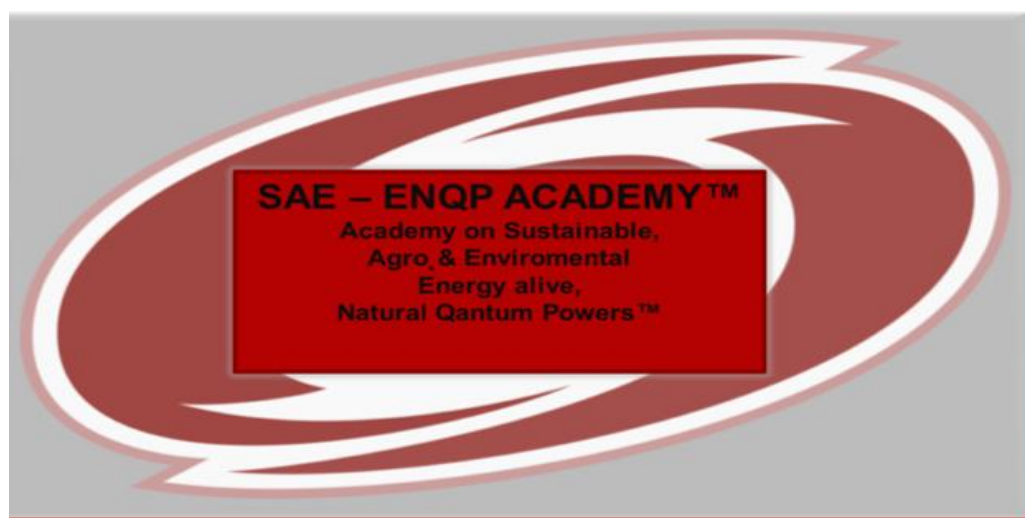
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APPLICATIVE RESEARCH PROJECT:

Effectiveness of the product

Cora agrohomeopathie X62

in case of drought and high temperatures in growing seasons:

**By strengthening plants vitality, implicate successful & efficient strengthening of
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on their ability to adapt to Climate Change – to the conditions of drought and high
temperature**



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VITALITY OF PLANTS AND ECOSYSTEMS, WHICH INDIRECTLY AFFECT ON PLANTS
RESISTANCE OF PLANTS DISEASES AND PESTS AND ON STRENGTHENING OF
ENERGY BALANCE OF SPRAYED ECOSYSTEMS.
MORE VITAL PLANTS ARE MORE RESISTANT TO PLANTS DISEASES AND PESTS.

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