



# TRIAL REPORT

WEED CONTROL IN SPRING CEREALS  
PUBLIC ADVISORY TRIALS  
IN JOKIOINEN AND YLISTARO

Natural Resources Institute Finland 2015


*Sanni Junnila and Tapio Kujala*

**WEED CONTROL IN SPRING CEREALS, PUBLIC ADVISORY TRIALS IN JOKIOINEN AND YLISTARO**

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- Method:** Two field trials with randomised complete block design
- Objectives:** Efficacy of herbicides on broad-leaved weeds in spring wheat in Jokioinen and in barley in Ylistaro
- Trial quality:** According to GEP standards and EPPO guidelines PP 1/135(3), PP 1/152(4), PP 1/181(4) and PP 1/93(3)

<b>Trial ID</b>	<b>Crop, variety</b>	<b>Location</b>	<b>Exp. starting date</b>	<b>Exp. completion date</b>
H-15-053-34	Spring wheat, Wellamo	Jokioinen	20/05/15	11/11/15
H-15-050-20	Barley, Edel	Ylistaro	23/05/15	21/08/15

Jokioinen 20.11.2015



**Sanni Junnila, Study Director**

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## SUMMARY

### H-15-053-34 Spring wheat in Jokioinen

Wellamo spring wheat variety was drilled on May 20<sup>th</sup> 2015 on sandy clay soil. Weed infestation with CHEAL (*Chenopodium album*), STEME (*Stellaria media*), LAPCO (*Lapsana communis*) and GALSP (*Galium spurium*) occurred at the application time in the trial with total number of 87 per square meter. In addition, some CIRAR (*Cirsium arvense*) plants occurred almost in every plot. The number of CIRAR plants per plot was counted visually at application time and it varied approximately between 2 and 14 per plot. However, the efficacy results against CIRAR are only suggestive without reliable comparability between the treatments. Efficacy value was estimated as an average of plots containing CIRAR.

Growing season 2015 was cool and rainy until August. The mean temperature of May, June and July was 0.9, 1.6 and 1.6 °C lower, respectively, than the long term normal mean temperature in Jokioinen. In the end of July the effective temperature sum was 132 Celsius degrees lower than on average. In two weeks, one week before and one week after the application time, it rained 69 mm in total, and in six days more than 8 mm. Spring wheat turned to suffer from cool and wet conditions from the end of June onwards. However, the humid conditions might also increase the efficacy of most treatments. Herbicide applications were made on wet soil on June 26<sup>th</sup> 2015 (14.5 °C, 76 % RH) at BBCH stage 30 of spring wheat. Heavy rain shower of 11 mm occurred two hours after the application.

#### Phytotoxicity

Phytotoxicity was assessed three times: 7, 14 and 20 days after the application (DA-A). The phytotoxicity like bleaching was difficult to separate from crop yellowing caused by the wet conditions. All treatments except Express 50 SX plus Starane 180, both Sekator OD treatments and Cleave caused slight bleaching and/or shortening of wheat (1 %) two weeks after application at 14 DA-A. Symptoms were found at least three weeks after application. Shortening was most obvious with Broadway (3%).

#### Efficacy

Weed efficacy was assessed twice, 3 and 7 weeks after the application. In the assessment 20 DA-A, Cleave, Starane 180 plus Sekator OD and the low Sekator OD dose controlled CIRAR less than 80 % (61-79 %, Figure 1), when the other treatments reduced CIRAR 80-97 %. One month later the efficacy of those three treatments and that of Tooler had reduced to 34-40 %. Sekator OD with MCPA seemed to control CIRAR best (90 %) and all remained treatments from 70 to 80 %, except Logran plus Duplosan Meko and Biathlon 4D about 50 %. GALSP, STEME, CHEAL and LAPCO were controlled 78-100 % at both observation timings with all treatments. The efficacy of Tooler and Sekator OD sprayed alone remained slightly lower (88-93 %) on GALSP compared to the efficacy of other treatments at 49 DA-A, when Tooler and Ariane S controlled STEME 96 % and all others 100 %. Ariane S controlled LAPCO 87-89 % when the other treatments destroyed it 94-100 %. Three weeks after application Ariane S and the mixture of Sekator OD plus Starane 180 seemed to control CHEAL slightly weaker (78-87 %) than all other treatments (94-100 %). This difference was not anymore found one month later, when the efficacy of Broadway on CHEAL seemed to be slightly lower (88 %) than that of the other treatments.

POAAN (*Poa annua*) infestation was rather even in the trial area, and efficacy on it was evaluated at 49 DA-A. No statistically significant differences were found in efficacy between the treatments. Only the efficacy of both Sekator OD doses differed significantly from the untreated treatment, their effect was 50-55 %. Sekator OD mixed with Starane 180 and the mixture of Logran 20 WG with Duplosan Meko seemed to decrease POAAN about 45 %.

### Yield and yield quality

There were no statistically significant differences between the treatments in wheat yield or seed quality analysis. The wheat yield was in the untreated plots 4830 kg/ha, the thousand seed weight was 36.7 g, hectoliter weight 84.5 kg, protein content 9.9 % and starch content 68.3 %. Protein and starch contents were given as percent from dry matter. Yield increases from 2 to 12 % occurred. Protein content varied from 9.9. to 10.6 % (0-7 %).

### **H-15-050-20 Barley in Ylistaro**

Edel barley variety was drilled on May 23<sup>rd</sup> 2015 on loamy sand soil in Ylistaro, South Ostrobothnia. Weed infestation with CHEAL (*Chenopodium album*), STEME (*Stellaria media*), GALSP (*Galium spurium*), GAESS (*Galeopsis* spp) and MATIN (*Tripleurospermum inodorum*) occurred at the application time in the trial, every species was found more than 5 per square meter. Dense and even barley trial was fertilized with high amount of Nitrogen (150 kg/ha) and crop competed well with weeds.

The growing season was cool and rainy until August. The mean temperature of June and July was 1.6 and 1.4 °C lower, respectively, than the long term normal mean temperature in Ylistaro. For two weeks before the application time it rained 55 mm in total. Humid conditions and very dense and vigorous barley crop stand increased the efficacy of tested treatments. Herbicide applications were made on June 26<sup>th</sup> 2015 (14.3 °C, 72 % RH) at BBCH stage 25-31 of barley.

### Phytotoxicity

Phytotoxicity was assessed three times: 7, 14 and 28 days after the application (DA-A). Bleaching and/or stunting of crop were found one week after application in eight herbicide treatments sprayed with some sulfonylureas and with Ariane S. Bleaching varied between 3 and 15 % and values were highest in the plots sprayed with Primus XL plus Premium Classic and with Cleave. Shortening of barley was remarkable (9 %) in the plots sprayed with Cleave still one month after application.

### Efficacy

Weed efficacy was assessed twice, one and two months after the application. Every treatment controlled the weeds 100 % in the humid weather conditions in the barley crop with extremely high ability to compete with the broad leaved weeds existed. Farmer of the trial field estimated the barley yield level to be more than 6 tn/ha.

## TIIVISTELMÄ

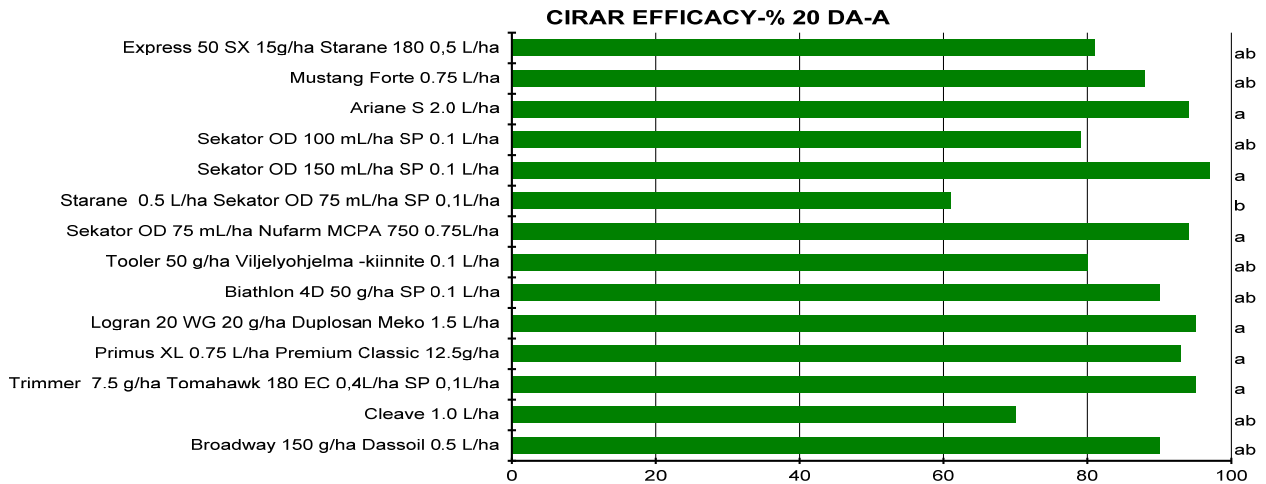
Eri herbisidikäsitteilyjen tehoa tutkittiin kasvukaudella 2015 leveälehtisten rikkakasvien torjuntaan kahdessa kevätiljakokeessa. Wellamo kevätvehnä kylvettiin 20.5.2015 Jokioisilla ja Edel ohra 23.5.2015 Ylistarossa. Molemmat kokeet ruiskutettiin 26.6. viljan pensomisen lopulla (BBCH 30) samankaltaisissa oloissa; lämpötila oli 14 °C ja ilman suhteellinen kosteus 72 - 76 %. Kasvukausi oli heinäkuun lopulle saakka viileä ja sadepäiviä oli runsaasti. Kesä- heinäkuun keskilämpötilat olivat 1.4 - 1.6 °C pitkän aikavälin keskiarvoja alhaisemmat.

Ruiskutusten aiheuttamat viljan voitukset arvioitiin kolmesti; 7, 14 ja 20 - 28 päivää ruiskutuksesta. Jokioisten vehnäkokeessa useimmat herbisidikäsitteilyt aiheuttivat vähäistä kasvuston vaalenemista ja lyhentymistä (1-3 %) kahdesta kolmeen viikkoa ruiskutuksen jälkeen. Ohrassa voitusoireet olivat voimakkaampia (3-15 %) ja niitä esiintyi harvemmissä käsitteilyissä pääasiassa vain viikon kuluttua käsitteilystä (7 DA-A).

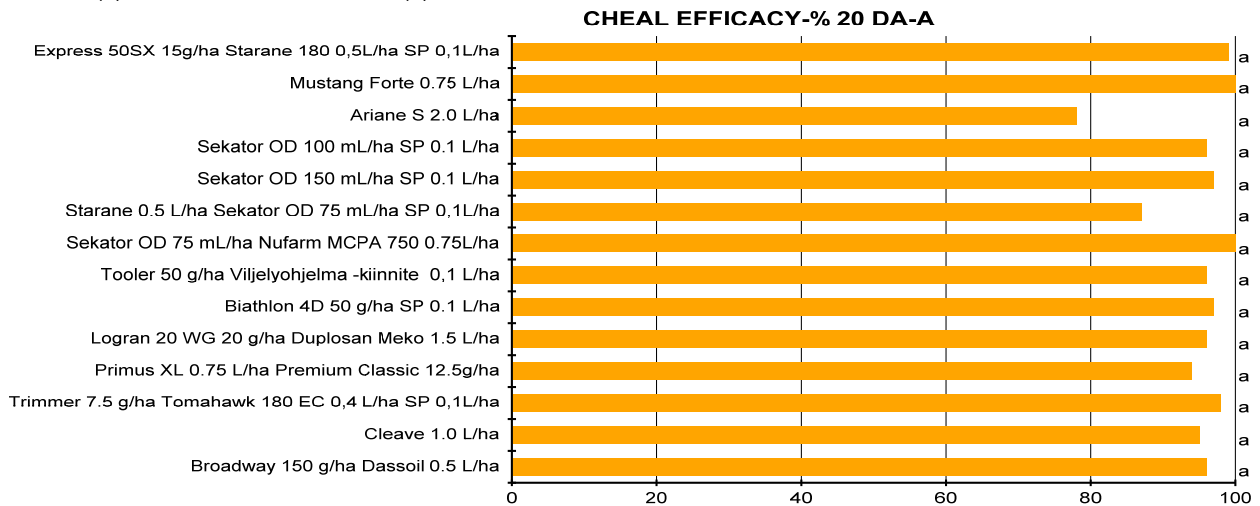
Teho rikkakasveihin arvioitiin visuaalisesti kahdesti; 3-4 ja 7-8 viikkoa käsitteilystä. Tehoerot tutkittavien valmisteiden välillä olivat vähäiset. Ylistaron voimakkaasti lannoitetussa, erittäin tiheässä ja hyvin kilpailevassa ohrassa kaikki käsitteilyt torjuivat savikan, mataran, pihatähtimön, pillikkeen ja saunakukan 100 %. Harvemmassa, liiallisesta märkyydestä osittain heinäkuussa kärsineessä vehnässä kaikki käsitteilyt torjuivat mataran, pihatähtimön, savikan ja linnunkaalin 78 - 100 prosenttisesti. Seitsemän viikkoa käsitteilystä herbisidien välillä ei esiintynyt tilastollisesti merkitseviä tehoeroja kuin pihatähtimöllä, jonka Tooler torjui muita kuin Ariane S -valmistetta heikommin. Silti myös Toolerin ja Ariane S:n teho pihatähtimöön oli 96 - 97 %. Kolme viikkoa ruiskutuksesta Ariane S torjui linnunkaalta 87 % muiden valmisteiden torjuessa sitä 97 - 100 %. Pieniä eroja valmisteiden välillä esiintyi tehossa mataraan ja savikkaan. Koealalla esiintyi kohtalaisen runsaasti kylänurmikkaa. Molemmat Sekator OD annokset puolittivat sen biomassan, mutta muilla käsitteilyillä kylänurmikkaan ei ollut merkittävää vaikutusta. Ohdaketta esiintyi lähes jokaisella ruudulla ja sen kehitysasteessa ruiskutushetkellä oli suuria eroja, mikä osaltaan saattoi vaikuttaa saatuun tehoon. Tehotulokset ohdakkeeseen ovatkin vain suuntaa-antavia, eivätkä valmisteiden väliset erot ole luotettavia. Kolme viikkoa ruiskutuksen jälkeen 80 % tai sitä heikommin tehosivat ohdakkeeseen Cleave, Tooler, pieni Sekator OD annos sekä Staranen ja Sekator OD:n seos. Kuukauden kuluttua tästä näiden teho oli pienentynyt 34 - 40 prosenttiin. Vehnäsadon määrässä ja sadon laadussa ei esiintynyt tilastollisesti merkitseviä eroja. Jyväsadon määrä oli käsittelemättömillä vehnäruuduilla 4830 kg/ha, tuhannen siemenen paino 36.7 g, hehtolitrapaino 84.5 kg, proteiinipitoisuus 9.9 % kuiva-aineesta ja tärkkelyksen määrä 68.3 % kuiva-aineesta.

Kahden viileissä ja kosteissa oloissa kevätiljoilla toteutetun tehokkuuskokeen tulosten perusteella tutkitut herbisidikäsitteilyt olivat tehokkaita ja keskenään vertailukelpoisia yleisimpien rikkakasvilajien torjunnassa. Pieniä tehoeroja valmisteiden välillä esiintyi Jokioisten vehnäkokeessa. Käytännössä on tärkeää vuorotella peräkkäisinä vuosina eri vaikutustavan omaavia valmisteita resistenssiriskin välttämiseksi.

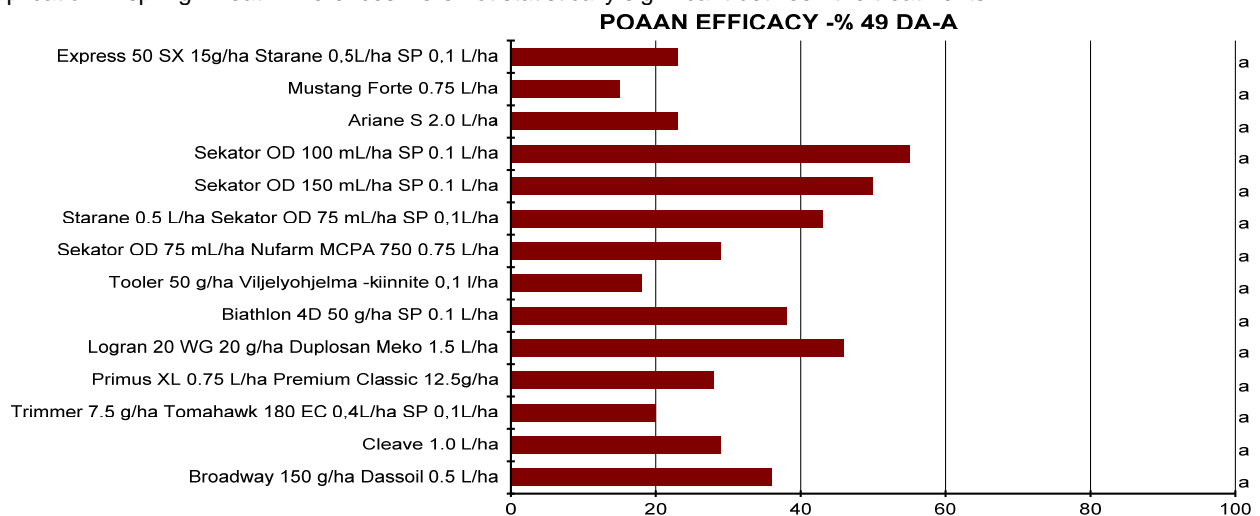
## FIGURES



**Figure 1.** Efficacy of fourteen herbicide treatments on CIRAR (*Cirsium arvense*) assessed visually 20 days after the application in spring wheat. The mixture treatment of Starane 180 plus Sekator OD was statistically significantly weaker on CIRAR (b) than six other treatments (a).



**Figure 2.** Efficacy of fourteen herbicide treatments on CHEAL (*Chenopodium album*) assessed visually 20 days after application in spring wheat. Differences were not statistically significant between the treatments.



**Figure 3.** Efficacy of fourteen herbicide treatments on POAAN (*Poa annua*) assessed visually 49 days after application in spring wheat. Both Sekator OD doses sprayed alone controlled *Poa* about 50 % and significantly when compared with the untreated treatment.

## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

Trial ID: H-15-053-35      Protocol ID: H-15-053-34  
 Location: Jokioinen      Study Director: Sanni Junnila  
 Project ID:      Investigator: Sanni Junnila  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

Trt No.	Treatment Name	Form Conc	Form Type	Lot Code	Rate	Rate Unit	Growth Stage	Appl Code	Comment 1
1	Untreated Check								Luke
2	Express 50 SX -tribenuron-methyl Starane 180 -fluroxypyr Sito Plus	500 500 180 180	SG EC SL	JAN13CE241 ZB22150107 11.3.7706	15 7.5 0.5 90 0.1	g/ha g Al L/ha g Al L/ha	30 30 30	A A A	Luke
3	Mustang Forte -2,4-D -aminopyralid -florasulam	195 180 10 5	SE	3B04150101	0.75 135 7.5 3.75	L/ha g Al g Al g Al	30	A	Dow
4	Ariane S -MCPA -fluroxypyr -clopyralid	260 200 40 20	EW	3B14150101	2.0 400 80 40	L/ha g Al g Al g Al	30	A	Dow
5	Sektor OD -amidosulfuron -iodosulfuron-methyl sodium Sito Plus	125 100 25	SL SL	EKFM002457 11.3.7706	100 10 2.5 0.1	mL/ha g Al g Al L/ha	30 30	A A	Bayer
6	Sektor OD -amidosulfuron -iodosulfuron-methyl sodium Sito Plus	125 100 25	SL SL	EKFM002457 11.3.7706	150 15 3.75 0.1	mL/ha g Al g Al L/ha	30 30	A A	Bayer
7	Starane 180 -fluroxypyr Sektor OD -amidosulfuron -iodosulfuron-methyl sodium Sito Plus	180 180 125 100 25	EC SL SL	F006F31003 EKFM002457 11.3.7706	0.5 90 75 7.5 1.88 0.1	L/ha g Al mL/ha g Al g Al L/ha	30 30 30	A A A	Bayer
8	Sektor OD -amidosulfuron -iodosulfuron-methyl sodium Nufarm MCPA 750 -MCPA	125 100 25 750 750	SL EC	EKFM002457 T030A	75 7.5 1.88 0.75 560	mL/ha g Al g Al L/ha g Al	30 30	A A	Bayer
9	Tooler -tritosulfuron Viljelyohjelma -kiinnite -isodekylialkoholietoksilaatt	714 714	WG SL	03-000042 SP11.3.7706	50 35.7 0.1 0.9	g/ha g Al L/ha g Al	30 30	A A	BASF
10	Biathlon 4D -tritosulfuron -florasulam Sito Plus	768 714 54	WG SL	11-000011 11.3.7706	50 35.7 2.7 0.1	g/ha g Al g Al L/ha	30 30	A A	BASF
11	Logran 20 WG -triasulfuron Duplosan Meko -mecoprop-P	200 200 600 600	WG SL	065387-AR-001 Q121AD	20 4 1.5 900	g/ha g Al L/ha g Al	30 30	A A	Agrimarket
12	Primus XL -florasulam -fluroxypyr Premium Classic	105 5 100 500	SE SG	1G05150103 JAN13CE241	0.75 3.75 75 12.5	L/ha g Al g Al g/ha	30 30	A A	Agrimarket
13	Trimmer 500 WG -tribenuron-methyl Tomahawk 180 EC Sito Plus	500 500 180	WG SL SL	D-89503 16.4.15 11.3.7706	7.5 3.75 0.4 0.1	g/ha g Al L/ha L/ha	30 30 30	A A A	ADAMA
14	Cleave -fluroxypyr -florasulam	102.5 100 2.5	SE	D-106	1.0 100 2.5	L/ha g Al g Al	30	A	ADAMA
15	Broadway -pyroxsulam -florasulam Dassoil	91.1 68.3 22.8	WG SL	F490F3kpo1 16.5.11	150 10.2 3.42 0.5	g/ha g Al g Al L/ha	30 30	A A	Dow

Replications: 4, Untreated treatments: 1, Conduct under GLP/GEP: Yes (GEP with no protection), Design: Randomised Complete Block (RCB), Treatment units: Treated 'Plot' experimental unit size, Dry Form. Unit: %, Treated 'Plot' experimental unit size Width: 2 meters, Treated 'Plot' experimental unit size Length: 8 meters, Application volume: 200 L/ha, Mix size: 2.1 litres, Format definitions: G-All7.def, G-All7.frm



## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

Trial ID: H-15-053-35      Protocol ID: H-15-053-34  
 Location: Jokioinen      Study Director: Sanni Junnilla  
 Project ID:      Investigator: Sanni Junnilla  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

### General Trial Information

**Study Director:** Sanni Junnilla  
**Investigator:** Sanni Junnilla    **Title:** Research Scientist  
**Discipline:** H herbicide  
**Trial Status:** I one-year/interim  
**Initiation Date:** 20/05/15      **Planned Completion Date:** 30/11/15

**Trial Location**  
**City:** Jokioinen      **Latitude of LL Corner °:** 60.8167 N  
**Longitude of LL Corner °:** 23.4839 E  
**Postal Code:** FI-31600    **Altitude of LL Corner, Unit:** 100.00 m  
**Country:** FIN  
**Map Reference:** WGS 84

**Conducted Under GEP:** Yes

No.	Guideline	Description
1.	PP 1/93(3)	weeds in cereals
2.	PP 1/135(3)	Phytotoxicity assessment
3.	PP 1/152(4)	Design and analysis of efficacy evaluation trials
4.	PP 1/181(4)	Conduct and reporting of efficacy evaluation trials including good experimental

### Objectives:

Prioritary target:  
 GALSP, other BLW  
 Weeds minimum 5 / m2/species

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#### Conclusions:

Wellamo spring wheat variety was drilled on May 20<sup>th</sup> 2015 on sandy clay soil. Weed infestation with CHEAL (*Chenopodium album*), STEME (*Stellaria media*), LAPCO (*Lapsana communis*) and GALSP (*Galium spurium*) occurred at the application time in the trial with total number of 87 per square meter. In addition, some CIRAR (*Cirsium arvense*) plants occurred almost in every plot. The number of CIRAR plants per plot was counted visually at application time and it varied between 2 and 14. However, the efficacy results against CIRAR are only suggestive without reliable comparability between the treatments. Efficacy value is estimated as an average of plots containing CIRAR.

Growing season 2015 was cool and rainy until August. The mean temperature of May, June and July was 0.9, 1.6 and 1.6 °C lower, respectively, than the long term normal mean temperature in Jokioinen. In the end of July the effective temperature sum was 132 Celsius degrees lower than on average. In two weeks, one week before and one week after the application time, it rained 69 mm in total, and in six days more than 8 mm. Spring wheat turned to suffer from cool and wet conditions from the end of June onwards. However, the humid conditions might also increase the efficacy of most treatments. Herbicide applications were made on wet soil on June 26<sup>th</sup> 2015 (14.5 °C, 76 % RH) at BBCH stage 30 of spring wheat. Heavy rain shower of 11 mm occurred two hours after the application.

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Weed efficacy was assessed twice, 3 and 7 weeks after the application. In the assessment 20 DA-A, Cleave, Starane 180 plus Sekator OD and the the low Sekator dose controlled CIRAR less than 80 % (61-79 %), when the other treatments reduced CIRAR 80-97 %. One month later the efficacy of those three treatments and that of Tooler had reduced to 34-40 %. Sekator with MCPA seemed to control CIRAR best (90 %) and all remained treatments from 70 to 80 %, except Logran plus Duplosan Meko and Biathlon 4D about 50 %. GALSP, STEME, CHEAL and LAPCO were controlled 78-100 % at both observation timings with all treatments. The efficacy of Tooler and Sekator OD sprayed alone remained slightly lower (88-93 %) on GALSP compared to the efficacy of other treatments at 49 DA-A, when Tooler and Ariane S controlled STEME 96 % and all others 100 %. Ariane S controlled LAPCO 87-89 % when the other treatments destroyed it 94-100 %. Three weeks after application Ariane S and the mixture of Sekator OD plus Starane 180 seemed to control CHEAL slightly weaker (78-87 %) than all other treatments (94-100 %). This difference was not anymore found one month later, when the efficacy of Broadway on CHEAL seemed to be slightly lower (88 %) than that of the other treatments.

POAAN (*Poa annua*) infestation was rather even in the trial area, and efficacy on it was evaluated at 49 DA-A. No statistically significant differences were found in efficacy between the treatments. Only the efficacy of both Sekator OD doses differed significantly from the untreated treatment, their effect was 50-55 %. Sekator OD mixed with Starane 180 and the mixture of Logran 20 WG with Duplosan Meko seemed to decrease POAAN about 45 %.

There were no statistically significant differences between the treatments in wheat yield or seed quality analysis. The wheat yield was in the untreated plots 4830 kg/ha, the thousand seed weight was 36.7 g, hectoliter weight 84.5 kg, protein content 9.9 % and starch content 68.3 %. Protein and starch contents were given as percent from dry matter. Yield increases from 2 to 12 % occurred. Protein content varied from 9.9. to 10.6 % (0-7 %).

#### Personnel

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**Phone No.:** +358 29 532 6183

**Cooperator/Landowner**  
**Cooperator:** Natural Resources Institute Finland      **Role:** Landowner  
**City:** Jokioinen  
**Postal Code:** FI-31600  
**Country:** FIN      Tavastia

## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

Trial ID: H-15-053-35      Protocol ID: H-15-053-34  
 Location: Jokioinen      Study Director: Sanni Junnila  
 Project ID:      Investigator: Sanni Junnila  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

### Crop Description

**Crop 1:** TRZAS      Triticum aestivum (spring) Spring wheat  
**Variety:** Wellamo  
**BBCH Scale:** BCER  
**Planting Method:** DRILLE      drilled  
**Depth, Unit:** 3      cm  
**Row Spacing, Unit:** 12.5      cm  
**Seed Bed:** COARSE      coarse  
**Soil Moisture:** DAMP      damp  
**Harvest Date:** 06/10/15  
**Harvested Width, Unit:** 1.5      m  
**% Standard Moisture:** 15  
**Planting Date:** 20/05/15  
**Rate, Unit:** 210      KG/HA  
**Harvest Equipment:** Wintersteiger  
**Harvested Length, Unit:** 6.80      m

### Pest Description

**Pest 1 Type:** W      **Code:** GALSP Galium spurium  
**Common Name:** False cleavers  
**Pest 2 Type:** W      **Code:** CHEAL Chenopodium album  
**Common Name:** Common lambsquarters  
**Pest 3 Type:** W      **Code:** CIRAR Cirsium arvense  
**Common Name:** Canada thistle  
**Pest 4 Type:** W      **Code:** STEME Stellaria media  
**Common Name:** Common chickweed

### Site and Design

**Plot Width, Unit:** 2 m  
**Plot Length, Unit:** 8 m  
**Plot Area, Unit:** 16 m<sup>2</sup>  
**Replications:** 4  
**Site Type:** FIELD      field  
**Experimental Unit:** 1      PLOT plot  
**Tillage Type:** REDTIL      reduced-till  
**Study Design:** RACOB      Randomized Complete Block (RCB)  
**Untreated Arrangement:** INCLUDED      single control randomized in each block

No.	Previous Crop	Previous Pesticides	Year
1.	Oat	Ariane S	2014
2.	Winter wheat	Ally 40 ST	2013
3.	Barley	Ariane S	2012

### Maintenance

No.	Date	Maintenance Treatment Name	Rate	Rate Unit
1.	20/05/15	NPK N:27 P:2 K:3	350	kg/ha

### Soil Description

**% OM:** 4.09      **Texture:** SC sandy clay  
**pH:** 6.3      **Soil Name:** Sandy Clay  
**Fert. Level:** G good  
**Soil Drainage:** G good

### Additional Measured Elements

Element	Quantity	Unit
Ca	2094	mg/l
P	10.88	mg/l
K	176.3	mg/l
MG	323.7	mg/l

### Moisture and Weather Conditions

**Overall Moisture Conditions:** WEWEDR wet-wet-dry  
**Closest Weather Station:** Jokioinen Observatory      **Distance, Unit:** 0.859 km

## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

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 Project ID:

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 Study Director: Sanni Junnila  
 Investigator: Sanni Junnila  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

### Application Description

	A
Application Date:	26/06/15
Time of Day:	9:15
Application Method:	SPRAY
Application Timing:	POEMSL
Application Placement:	BROFOL
Applied By:	AM,ME,MK,SJ
Air Temperature, Unit:	14.5 C
% Relative Humidity:	76
Wind Velocity, Unit:	1.5 MPS
Dew Presence (Y/N):	N no
Soil Temperature, Unit:	13.7 C
Soil Moisture:	WET
% Cloud Cover:	95
Next Rain Occurred On:	26/06/15

### Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	TRZAS BCER
Stage Scale Used:	BBCH
Stage Majority, Percent:	30
Height, Unit:	33 cm
Height Minimum, Maximum:	30 35
Crop coverage (%):	30

## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

Trial ID: H-15-053-35	Protocol ID: H-15-053-34
Location: Jokioinen	Study Director: Sanni Junnila
Project ID:	Investigator: Sanni Junnila
Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow	

#### Pest Stage At Each Application

	A
<b>Pest 1 Code, Type, Scale:</b>	GALSP W BBCH
<b>Stage Minimum, Percent:</b>	12
<b>Stage Maximum, Percent:</b>	22
<b>Height, Unit:</b>	7 cm
<b>Height Minimum, Maximum:</b>	3 10
<b>Density, Unit:</b>	46 PLA/m <sup>2</sup>
<b>Coverage, Unit:</b>	5 %
<b>Pest 2 Code, Type, Scale:</b>	CHEAL W BBCH
<b>Stage Minimum, Percent:</b>	16
<b>Stage Maximum, Percent:</b>	50
<b>Height, Unit:</b>	7 cm
<b>Height Minimum, Maximum:</b>	5 10
<b>Density, Unit:</b>	20 PLA/m <sup>2</sup>
<b>Coverage, Unit:</b>	1 %
<b>Pest 3 Code, Type, Scale:</b>	CIRAR W BBCH
<b>Stage Minimum, Percent:</b>	15
<b>Stage Maximum, Percent:</b>	30
<b>Height, Unit:</b>	20 cm
<b>Height Minimum, Maximum:</b>	10 30
<b>Density, Unit:</b>	13 PLA/m <sup>2</sup>
<b>Coverage, Unit:</b>	3 %
<b>Pest 4 Code, Type, Scale:</b>	STEME W BBCH
<b>Stage Minimum, Percent:</b>	14
<b>Stage Maximum, Percent:</b>	22
<b>Height, Unit:</b>	7 cm
<b>Height Minimum, Maximum:</b>	5 10
<b>Density, Unit:</b>	12 PLA/m <sup>2</sup>
<b>Coverage, Unit:</b>	1 %

## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

Trial ID: H-15-053-35  
 Location: Jokioinen  
 Project ID:

Protocol ID: H-15-053-34  
 Study Director: Sanni Junnilla  
 Investigator: Sanni Junnilla  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

#### Application Equipment

	A
<b>Appl. Equipment:</b>	Plot sprayer
<b>Equipment Type:</b>	SPRAYE
<b>Operation Pressure, Unit:</b>	2.0 bar
<b>Nozzle Type:</b>	Hardi4110
<b>Nozzle Size:</b>	12
<b>Nozzle Spacing, Unit:</b>	50 cm
<b>Nozzles/Row:</b>	6
<b>Boom ID:</b>	KSU3
<b>Boom Length, Unit:</b>	3 m
<b>Boom Height, Unit:</b>	50 cm
<b>Ground Speed, Unit:</b>	1 mps
<b>Carrier:</b>	water
<b>Spray Volume, Unit:</b>	200 l/ha
<b>Mix Size, Unit:</b>	2.1 Liters

Date	By	Notes
26/06/15	SJ	Two hours after application (9:15 - 10:05 o'clock) it started rather heavy rain of about 11 mm in total.

## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

Trial ID: H-15-053-35      Protocol ID: H-15-053-34  
 Location: Jokioinen      Study Director: Sanni Junnila  
 Project ID:                  Investigator: Sanni Junnila  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed		
Pest Code	CIRAR	CIRAR	GALSP	STEME	LAPCO	CHEAL		
Crop Code	TRZAS	TRZAS	TRZAS	TRZAS	TRZAS	TRZAS		
Crop Variety	Wellamo	Wellamo	Wellamo	Wellamo	Wellamo	Wellamo		
Description	height 30-35 cm	height 30-35 cm	height 30-35 cm	height 30-35 cm	height 30-35 cm	height 30-35 cm		
Part Rated	PLANT P	PLANT P	PLANT P	PLANT P	PLANT P	PLANT P		
Rating Date	26/06/15	29/06/15	29/06/15	29/06/15	29/06/15	29/06/15		
Rating Type	COUNT	COUNT	COUNT	COUNT	COUNT	COUNT		
Rating Unit	NUMBER	NUMBER	NUMBER	NUMBER	NUMBER	NUMBER		
Sample Size, Unit	1 PLOT	1 m2	1 m2	1 m2	1 m2	1 m2		
Number of Subsamples	1	1	1	1	1	1		
Crop Stage Majority	30	30	30	30	30	30		
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH		
Crop Density, Unit	30 %	30 %	30 %	30 %	30 %	30 %		
Pest Stage Majority	15-20	15-30	12-22	14-22	11-15	16-50		
Assessed By	SJ, AM	AM,LP,EJ	AM,LP,EJ	AM,LP,EJ	AM,LP,EJ	AM,LP,EJ		
Days After First/Last Applic.	0 0	3 3	3 3	3 3	3 3	3 3		
Trt-Eval Interval	0 DA-A	3 DA-A	3 DA-A	3 DA-A	3 DA-A	3 DA-A		
ARM Action Codes								
Trt Treatment	Rate	Appl						
No. Name	Rate Unit	Code	1	2	3	4	5	6
1 Untreated Check			14 a	13	46	12	9	20
2 Express 50 SX Starane 180 Sito Plus	15 g/ha 0.5 L/ha 0.1 L/ha	A A A	9 a					
3 Mustang Forte	0.75 L/ha	A	8 a					
4 Ariane S	2.0 L/ha	A	7 a					
5 Sekator OD Sito Plus	100 mL/ha 0.1 L/ha	A A	9 a					
6 Sekator OD Sito Plus	150 mL/ha 0.1 L/ha	A A	6 a					
7 Starane 180 Sekator OD Sito Plus	0.5 L/ha 75 mL/ha 0.1 L/ha	A A A	11 a					
8 Sekator OD Nufarm MCPA 750	75 mL/ha 0.75 L/ha	A A	7 a					
9 Tooler Vijelyohjelma -kiinnite	50 g/ha 0.1 L/ha	A A	2 a					
10 Biathlon 4D Sito Plus	50 g/ha 0.1 L/ha	A A	4 a					
11 Logran 20 WG Duplosan Meko	20 g/ha 1.5 L/ha	A A	7 a					
12 Primus XL Premium Classic	0.75 L/ha 12.5 g/ha	A A	7 a					
13 Trimmer 500 WG Tomahawk 180 EC Sito Plus	7.5 g/ha 0.4 L/ha 0.1 L/ha	A A A	6 a					
14 Cleave	1.0 L/ha	A	6 a					
15 Broadway Dassoil	150 g/ha 0.5 L/ha	A A	8 a					
LSD P=.05			9.4	.	.	.	.	.
Standard Deviation			6.6	.	.	.	.	.
CV			90.07	.	.	.	.	.
Bartlett's X2			11.169	.	.	.	.	.
P(Bartlett's X2)			0.673	.	.	.	.	.
Replicate F			4.289					
Replicate Prob(F)			0.0100					
Treatment F			0.680					
Treatment Prob(F)			0.7802					

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Column 20 Footnote: height CIRAR 15-100 cm  
 Column 21 Footnote: height GALSP 40 cm  
 Column 22 Footnote: height STEME 15-50 cm  
 Column 23 Footnote: height CHEAL 10-25 cm  
 Column 24 Footnote: height LAPCO 25 cm  
 Column 25 Footnote: height POAAN 5-45 cm  
 Column 34: TY1 = 0.9803922\*[C32]\*(100-[C33])/85  
 Column 36: T2 = ((100-@AVGSUB([C33]))\*@AVGSUB([C35]))/85  
 Column 38: T3 = ((100-@AVGSUB([C33]))\*@AVGSUB([C37]))/85  
 Column 40: T4 = @AVGSUB([C39])

Could not calculate LSD (% mean diff) for columns 2,3,4,5,6,7, 15,16,17,18, 19,26,27,28,29,30,31 because error mean square = 0.

## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

Trial ID: H-15-053-35      Protocol ID: H-15-053-34  
 Location: Jokioinen      Study Director: Sanni Junnila  
 Project ID:      Investigator: Sanni Junnila  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

Pest Type	TRZAS		TRZAS		TRZAS		W Weed	W Weed	W Weed	
Pest Code	TRZAS		TRZAS		TRZAS		CIRAR	GALSP	STEME	
Crop Code	TRZAS		TRZAS		TRZAS		TRZAS	TRZAS	TRZAS	
Crop Variety	Wellamo		Wellamo		Wellamo		Wellamo	Wellamo	Wellamo	
Description	height 45-50cm		height 65 cm		height 80 cm		height 75-80 cm	height 75-80 cm	height 75-80 cm	
Part Rated	PLANT C		PLANT C		PLANT C		PLANT P	PLANT P	PLANT P	
Rating Date	03/07/15		10/07/15		16/07/15		16/07/15	16/07/15	16/07/15	
Rating Type	PHYGEN		PHYGEN		PHYGEN		CONTRO	CONTRO	CONTRO	
Rating Unit	%		%		%		%	%	%	
Sample Size, Unit	1 PLOT		1 PLOT		1 PLOT		1 PLOT	1 PLOT	1 PLOT	
Number of Subsamples	1		1		1		1	1	1	
Crop Stage Majority	32		39		50		50	50	50	
Crop Stage Scale	BBCH		BBCH		BBCH		BBCH	BBCH	BBCH	
Crop Density, Unit	40 %		55 %		70 %		70 %	70 %	70 %	
Pest Stage Majority	39-51		51-60		51-60		60-61	60-61	60-61	
Assessed By	SJ		SJ		SJ		LR,EJ	LR,EJ	LR,EJ	
Days After First/Last Applic.	7 7		14 14		20 20		20 20	20 20	20 20	
Trt-Eval Interval	7 DA-A		14 DA-A		20 DA-A		20 DA-A	20 DA-A	20 DA-A	
ARM Action Codes	P		P		P		P	P	P	
Trt No.	Treatment Name	Rate	Unit	Appl Code	7	8	9	10	11	12
1	Untreated Check				0 a	0 c	0 b	0 c	0 c	0 b
2	Express 50 SX Starane 180 Sito Plus	15 g/ha 0.5 L/ha 0.1 L/ha	A A A		0 a	0 c	0 b	81 ab	99 a	100 a
3	Mustang Forte	0.75 L/ha	A		0 a	2 ab	1 ab	88 a	97 ab	99 a
4	Ariane S	2.0 L/ha	A		0 a	1 bc	1 ab	94 a	100 a	99 a
5	Sekator OD Sito Plus	100 mL/ha 0.1 L/ha	A A		0 a	0 c	1 ab	79 ab	97 ab	99 a
6	Sekator OD Sito Plus	150 mL/ha 0.1 L/ha	A A		0 a	0 c	0 b	97 a	97 ab	99 a
7	Starane 180 Sekator OD Sito Plus	0.5 L/ha 75 mL/ha 0.1 L/ha	A A A		0 a	1 bc	1 ab	61 b	98 ab	100 a
8	Sekator OD Nufarm MCPA 750	75 mL/ha 0.75 L/ha	A A		0 a	1 bc	1 ab	94 a	98 a	99 a
9	Tooler Viljelyohjelma -kiinnite	50 g/ha 0.1 L/ha	A A		0 a	1 bc	1 ab	80 ab	91 b	99 a
10	Biathlon 4D Sito Plus	50 g/ha 0.1 L/ha	A A		0 a	1 bc	1 ab	90 a	96 ab	99 a
11	Logran 20 WG Duplosan Meko	20 g/ha 1.5 L/ha	A A		0 a	1 bc	1 ab	95 a	100 a	100 a
12	Primus XL Premium Classic	0.75 L/ha 12.5 g/ha	A A		0 a	1 bc	0 b	93 a	100 a	100 a
13	Trimmer 500 WG Tomahawk 180 EC Sito Plus	7.5 g/ha 0.4 L/ha 0.1 L/ha	A A A		0 a	1 bc	1 ab	95 a	99 a	100 a
14	Cleave	1.0 L/ha	A		0 a	0 c	0 b	70 ab	97 ab	100 a
15	Broadway Dassoil	150 g/ha 0.5 L/ha	A A		0 a	3 a	3 a	90 a	98 ab	99 a
LSD P=.05						1.2	1.5	17.6	4.7	1.0
Standard Deviation					0.0	0.8	1.1	12.4	3.3	0.7
CV					0.0	124.28	161.47	15.39	3.62	0.73
Bartlett's X2					0.0	3.053	1.666	42.167	48.959	5.52
P(Bartlett's X2)					.	0.931	0.996	0.001*	0.001*	0.962
Replicate F					0.000	0.324	0.384	1.834	1.537	2.395
Replicate Prob(F)					1.0000	0.8082	0.7654	0.1556	0.2190	0.0818
Treatment F					0.000	4.353	2.055	15.669	235.696	5810.116
Treatment Prob(F)					1.0000	0.0001	0.0364	0.0001	0.0001	0.0001



## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

Trial ID: H-15-053-35      Protocol ID: H-15-053-34  
 Location: Jokioinen      Study Director: Sanni Junnila  
 Project ID:      Investigator: Sanni Junnila  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

Pest Type	W Weed	W Weed	W Weed	W Weed	W Weed	W Weed		
Pest Code	LAPCO	CHEAL	CIRAR	GALSP	STEME	LAPCO		
Crop Code	TRZAS	TRZAS	TRZAS	TRZAS	TRZAS	TRZAS		
Crop Variety	Wellamo	Wellamo	Wellamo	Wellamo	Wellamo	Wellamo		
Description	height 75-80 cm	height 75-80 cm	height 75-80 cm	height 75-80 cm	height 75-80 cm	height 75-80 cm		
Part Rated	PLANT P	PLANT P	PLANT P	PLANT P	PLANT P	PLANT P		
Rating Date	16/07/15	16/07/15	16/07/15	16/07/15	16/07/15	16/07/15		
Rating Type	CONTRO	CONTRO	GROUND	GROUND	GROUND	GROUND		
Rating Unit	%	%	%	%	%	%		
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT		
Number of Subsamples	1	1	1	1	1	1		
Crop Stage Majority	50	50	50	50	50	50		
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH		
Crop Density, Unit	70 %	70 %	70 %	70 %	70 %	70 %		
Pest Stage Majority	14-51	51	39-51	60-61	51-60	14-51		
Assessed By	LR,EJ	LR,EJ	LR,EJ	LR,EJ	LR,EJ	LR,EJ		
Days After First/Last Applic.	20 20	20 20	20 20	20 20	20 20	20 20		
Trt-Eval Interval	20 DA-A	20 DA-A	20 DA-A	20 DA-A	20 DA-A	20 DA-A		
ARM Action Codes	P	P	P	P	P	P		
Trt Treatment	Rate	Appl	13	14	15	16	17	18
No. Name	Rate Unit	Code						
1 Untreated Check			0 c	0 b	3	1	2	1
2 Express 50 SX Starane 180 Sito Plus	15 g/ha 0.5 L/ha 0.1 L/ha	A A A	99 a	99 a				
3 Mustang Forte	0.75 L/ha	A	98 a	100 a				
4 Ariane S	2.0 L/ha	A	87 b	78 a				
5 Sekator OD Sito Plus	100 mL/ha 0.1 L/ha	A A	99 a	96 a				
6 Sekator OD Sito Plus	150 mL/ha 0.1 L/ha	A A	100 a	97 a				
7 Starane 180 Sekator OD Sito Plus	0.5 L/ha 75 mL/ha 0.1 L/ha	A A A	99 a	87 a				
8 Sekator OD Nufarm MCPA 750	75 mL/ha 0.75 L/ha	A A	99 a	100 a				
9 Tooler Vijelyohjelma -kiinnite	50 g/ha 0.1 L/ha	A A	97 a	96 a				
10 Biathlon 4D Sito Plus	50 g/ha 0.1 L/ha	A A	99 a	97 a				
11 Logran 20 WG Duplosan Meko	20 g/ha 1.5 L/ha	A A	99 a	96 a				
12 Primus XL Premium Classic	0.75 L/ha 12.5 g/ha	A A	98 a	94 a				
13 Trimmer 500 WG Tomahawk 180 EC Sito Plus	7.5 g/ha 0.4 L/ha 0.1 L/ha	A A A	97 a	98 a				
14 Cleave	1.0 L/ha	A	99 a	95 a				
15 Broadway Dassoil	150 g/ha 0.5 L/ha	A A	99 a	96 a				
LSD P=.05			3.9	16.8	.	.	.	.
Standard Deviation			2.7	11.8	.	.	.	.
CV			3.01	13.33	.	.	.	.
Bartlett's X2			69.136	86.973	.	.	.	.
P(Bartlett's X2)			0.001*	0.001*	.	.	.	.
Replicate F			1.434	4.236				
Replicate Prob(F)			0.2463	0.0105				
Treatment F			343.565	18.177				
Treatment Prob(F)			0.0001	0.0001				





## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

Trial ID: H-15-053-35      Protocol ID: H-15-053-34  
 Location: Jokioinen      Study Director: Sanni Junnilla  
 Project ID:      Investigator: Sanni Junnilla  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

Pest Type	TRZAS	TRZAS	TRZAS	TRZAS	TRZAS	TRZAS	TRZAS			
Pest Code	Wellamo	Wellamo	Wellamo	Wellamo	Wellamo	Wellamo	Wellamo			
Crop Code	dryed	moisture 15%	dryed	moisture 15%	dryed	moisture 15%	dryed			
Crop Variety	GRAIN C	YIELD C	GRAIN C	GRAIN C	GRAIN C	GRAIN C	GRAIN C			
Description	GRAIN C	YIELD C	GRAIN C	GRAIN C	GRAIN C	GRAIN C	GRAIN C			
Part Rated										
Rating Date	11/11/15	11/11/15	09/11/15	11/11/15	11/11/15	11/11/15	11/11/15			
Rating Type	MOICON	YIELD	TKW	TKW	HLW	HLW	PROCON			
Rating Unit	%	kg	g	g	kg	kg	%			
Sample Size, Unit	10.2 m <sup>2</sup>	1 ha	1000 SEED	1000 SEED	1 hL	1 hL	1 SAMPLE			
Number of Subsamples	2	1	2	1	2	1	2			
Crop Stage Majority	99	99	99	99	99	99	99			
Crop Stage Scale	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH	BBCH			
Crop Density, Unit										
Pest Stage Majority										
Assessed By	LR	KP	ER,LR	KP	LR	KP	LR			
Days After First/Last Applic.	138 138	138 138	136 136	138 138	138 138	138 138	138 138			
Trt-Eval Interval	138 DA-A	138 DA-A	136 DA-A	138 DA-A	138 DA-A	138 DA-A	138 DA-A			
ARM Action Codes		TY1 APOC		T2 APOC		T3 APOC	P			
Trt No.	Treatment Name	Rate	Appl Code	33	34	35	36	37	38	39
1	Untreated Check			6.70 a	4829 a (100%)	33.466 a	36.7 a (100%)	77.0 a	84.5 a (100%)	9.9 a
2	Express 50 SX Starane 180 Sito Plus	15 g/ha 0.5 L/ha 0.1 L/ha	A A A	6.91 a	5003 a (104%)	33.614 a	36.8 a (100%)	77.1 a	84.4 a (100%)	10.1 a
3	Mustang Forte	0.75 L/ha	A	7.01 a	4931 a (102%)	34.038 a	37.2 a (101%)	77.5 a	84.7 a (100%)	10.3 a
4	Ariane S	2.0 L/ha	A	6.89 a	5096 a (106%)	33.737 a	37.0 a (101%)	77.4 a	84.8 a (100%)	10.4 a
5	Sekator OD Sito Plus	100 mL/ha 0.1 L/ha	A A	6.80 a	5433 a (112%)	33.760 a	37.0 a (101%)	77.4 a	84.8 a (100%)	10.5 a
6	Sekator OD Sito Plus	150 mL/ha 0.1 L/ha	A A	6.66 a	4950 a (102%)	33.489 a	36.8 a (100%)	77.1 a	84.7 a (100%)	9.9 a
7	Starane 180 Sekator OD Sito Plus	0.5 L/ha 75 mL/ha 0.1 L/ha	A A A	6.75 a	4920 a (102%)	33.620 a	36.9 a (100%)	77.0 a	84.4 a (100%)	10.1 a
8	Sekator OD Nufarm MCPA 750	75 mL/ha 0.75 L/ha	A A	6.78 a	4778 a (99%)	33.319 a	36.5 a (99%)	77.0 a	84.5 a (100%)	9.9 a
9	Tooler Viljelyohjelma -kiinnite	50 g/ha 0.1 L/ha	A A	6.36 a	4955 a (103%)	33.651 a	37.1 a (101%)	76.9 a	84.7 a (100%)	10.0 a
10	Biathlon 4D Sito Plus	50 g/ha 0.1 L/ha	A A	6.78 a	5199 a (108%)	33.432 a	36.7 a (100%)	77.3 a	84.8 a (100%)	10.2 a
11	Logran 20 WG Duplosan Meko	20 g/ha 1.5 L/ha	A A	6.88 a	5380 a (111%)	33.533 a	36.7 a (100%)	77.6 a	85.0 a (101%)	10.6 a
12	Primus XL Premium Classic	0.75 L/ha 12.5 g/ha	A A	7.06 a	5099 a (106%)	33.932 a	37.1 a (101%)	77.3 a	84.5 a (100%)	10.1 a
13	Trimmer 500 WG Tomahawk 180 EC Sito Plus	7.5 g/ha 0.4 L/ha 0.1 L/ha	A A A	6.76 a	5089 a (105%)	33.707 a	37.0 a (101%)	77.3 a	84.8 a (100%)	10.1 a
14	Cleave	1.0 L/ha	A	6.89 a	5161 a (107%)	33.762 a	37.0 a (101%)	77.3 a	84.7 a (100%)	10.0 a
15	Broadway Dassoil	150 g/ha 0.5 L/ha	A A	6.41 a	5248 a (109%)	33.107 a	36.5 a (99%)	77.1 a	84.8 a (100%)	10.4 a
LSD P=.05				0.747	457.4	0.7861	0.81	0.55	0.75	0.61
Standard Deviation				0.524	320.5	0.5509	0.57	0.39	0.53	0.43
CV				7.73	6.32	1.64	1.55	0.5	0.62	4.22
Bartlett's X2				12.214	13.382	19.506	23.64	10.387	11.408	9.793
P(Bartlett's X2)				0.589	0.497	0.146	0.051	0.733	0.654	0.777
Replicate F				4.099	18.393	1.527	1.312	11.704	3.770	28.425
Replicate Prob(F)				0.0122	0.0001	0.2216	0.2830	0.0001	0.0175	0.0001
Treatment F				0.536	1.398	0.725	0.566	1.277	0.468	0.928
Treatment Prob(F)				0.8971	0.1965	0.7379	0.8757	0.2613	0.9376	0.5380

## Natural Resources Institute Finland (Luke)

### Weed control in spring wheat, public advisory trial in Jokioinen

Trial ID: H-15-053-35	Protocol ID: H-15-053-34
Location: Jokioinen	Study Director: Sanni Junnila
Project ID:	Investigator: Sanni Junnila
Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow	

Pest Type				
Pest Code				
Crop Code		TRZAS		TRZAS
Crop Variety		Wellamo		Wellamo
Description		average subsample		dryed
Part Rated		GRAIN C		GRAIN C
Rating Date		11/11/15		11/11/15
Rating Type		PROCON		STACON
Rating Unit		%		%
Sample Size, Unit		1 SAMPLE		1 SAMPLE
Number of Subsamples		1		2
Crop Stage Majority		99		99
Crop Stage Scale		BBCH		BBCH
Crop Density, Unit				
Pest Stage Majority				
Assessed By		KP		LR
Days After First/Last Applic.		138 138		138 138
Trt-Eval Interval		138 DA-A		138 DA-A
ARM Action Codes		T4 APOC		P
Trt Treatment	Rate	Appl		
No. Name	Rate Unit	Code	40	41
1 Untreated Check			9.9 a (100%)	68.3 a
2 Express 50 SX	15 g/ha	A	10.1 a (102%)	68.3 a
Starane 180	0.5 L/ha	A		
Sito Plus	0.1 L/ha	A		
3 Mustang Forte	0.75 L/ha	A	10.3 a (103%)	68.2 a
4 Ariane S	2.0 L/ha	A	10.4 a (104%)	68.2 a
5 Sekator OD	100 mL/ha	A	10.5 a (106%)	67.8 a
Sito Plus	0.1 L/ha	A		
6 Sekator OD	150 mL/ha	A	9.9 a (100%)	68.2 a
Sito Plus	0.1 L/ha	A		
7 Starane 180	0.5 L/ha	A	10.1 a (102%)	68.1 a
Sekator OD	75 mL/ha	A		
Sito Plus	0.1 L/ha	A		
8 Sekator OD	75 mL/ha	A	9.9 a (100%)	68.2 a
Nufarm MCPA 750	0.75 L/ha	A		
9 Tooler	50 g/ha	A	10.0 a (101%)	68.0 a
Vijelyohjelma -kiinnite	0.1 L/ha	A		
10 Biathlon 4D	50 g/ha	A	10.2 a (103%)	68.2 a
Sito Plus	0.1 L/ha	A		
11 Logran 20 WG	20 g/ha	A	10.6 a (107%)	68.0 a
Duplosan Meko	1.5 L/ha	A		
12 Primus XL	0.75 L/ha	A	10.1 a (102%)	68.2 a
Premium Classic	12.5 g/ha	A		
13 Trimmer 500 WG	7.5 g/ha	A	10.1 a (102%)	68.2 a
Tomahawk 180 EC	0.4 L/ha	A		
Sito Plus	0.1 L/ha	A		
14 Cleave	1.0 L/ha	A	10.0 a (101%)	68.3 a
15 Broadway	150 g/ha	A	10.4 a (105%)	67.9 a
Dassoil	0.5 L/ha	A		
LSD P=.05			0.61	0.57
Standard Deviation			0.43	0.40
CV			4.22	0.59
Bartlett's X2			9.793	8.838
P(Bartlett's X2)			0.777	0.841
Replicate F			28.425	12.743
Replicate Prob(F)			0.0001	0.0001
Treatment F			0.928	0.578
Treatment Prob(F)			0.5380	0.8667

## Natural Resources Institute Finland (Luke)

### Weed control in barley, public advisory trial

Trial ID: H-15-050-20      Protocol ID: H-15-050-20  
 Location: Ylistaro      Study Director: Sanni Junnila/Tapio Kujala  
 Project ID:      Investigator: Sanni Junnila  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

Trt No.	Treatment Name	Form Conc	Form Type	Lot Code	Rate	Rate Unit	Growth Stage	Appl Code	Comment 1
1	Untreated Check								Luke
2	Express 50 SX -tribenuron-methyl Starane 180 -fluroxypyr Sito Plus	500 500 180 180	SG EC SL	JAN13CE241 ZB22150107 11.3.7706	15 7.5 0.5 90 0.1	g/ha g AI L/ha g AI L/ha	30 30 30	A A A	Luke
3	Mustang Forte -2,4-D -aminopyralid -florasulam	195 180 10 5	SE	3B04150101	0.75 135 7.5 3.75	L/ha g AI g AI g AI	30	A	Dow
4	Ariane S -MCPA -fluroxypyr -clopypyrilid	260 200 40 20	EW	3B14150101	2.0 400 80 40	L/ha g AI g AI g AI	30	A	Dow
5	Sekator OD -amidosulfuron -iodosulfuron-methyl sodium Sito Plus	125 100 25	SL SL	EKFM002457 11.3.7706	100 10 2.5 0.1	mL/ha g AI g AI L/ha	30 30	A A	Bayer
6	Sekator OD -amidosulfuron -iodosulfuron-methyl sodium Sito Plus	125 100 25	SL SL	EKFM002457 11.3.7706	150 15 3.75 0.1	mL/ha g AI g AI L/ha	30 30	A A	Bayer
7	Starane 180 -fluroxypyr Sekator OD -amidosulfuron -iodosulfuron-methyl sodium Sito Plus	180 180 125 100 25	EC SL SL	F006F31003 EKFM002457 11.3.7706	0.5 90 75 7.5 1.88 0.1	L/ha g AI mL/ha g AI g AI L/ha	30 30 30	A A A	Bayer
8	Sekator OD -amidosulfuron -iodosulfuron-methyl sodium Nufarm MCPA 750 -MCPA	125 100 25 750 750	SL EC	EKFM002457 T030A	75 7.5 1.88 0.75 560	mL/ha g AI g AI L/ha g AI	30 30	A A	Bayer
9	Tooler -tritosulfuron Viljelyohjelma -kiinnite -isodekyylialkoholietoksilaatt	714 714	WG SL	SP11.3.7706	50 35.7 0.1 0.9	g/ha g AI L/ha g AI	30 30	A A	BASF
10	Biathlon 4D -tritosulfuron -florasulam Sito Plus	768 714 54	WG SL	11-000011 11.3.7706	50 35.7 2.7 0.1	g/ha g AI g AI L/ha	30 30	A A	BASF
11	Logran 20 WG -triasulfuron Duplosan Meko -mecoprop-P	200 200 600 600	WG SL	065387-AR-001 Q121AD	20 4 1.5 900	g/ha g AI L/ha g AI	30 30	A A	Agrimarket
12	Primus XL -florasulam -fluroxypyr Premium Classic	105 5 100 500	SE SG	1G05150103 JAN13CE241	0.75 3.75 75 12.5	L/ha g AI g AI g/ha	30 30	A A	Agrimarket
13	Trimmer 500 WG -tribenuron-methyl Tomahawk 180 EC Sito Plus	500 500 180	WG SL SL	D-89503 16.4.15 11.3.7706	7.5 3.75 0.4 0.1	g/ha g AI L/ha L/ha	30 30 30	A A A	ADAMA
14	Cleave -fluroxypyr -florasulam	102.5 100 2.5	SE	D-106	1.0 100 2.5	L/ha g AI g AI	30	A	ADAMA

Replications: 4, Untreated treatments: 1, Conduct under GLP/GEP: Yes (GEP with no protection), Design: Randomised Complete Block (RCB), Treatment units: Treated 'Plot' experimental unit size, Dry Form. Unit: %, Treated 'Plot' experimental unit size Width: 2 meters, Treated 'Plot' experimental unit size Length: 8 meters, Application volume: 200 L/ha, Mix size: 2.3 litres, Format definitions: G-All7.def, G-All7.frm

## Natural Resources Institute Finland (Luke)

### Weed control in barley, public advisory trial

Trial ID: H-15-050-20      Protocol ID: H-15-050-20  
 Location: Ylistaro      Study Director: Sanni Junnilla/Tapio Kujala  
 Project ID:      Investigator: Sanni Junnilla  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

### General Trial Information

**Study Director:** Sanni Junnilla      **Title:** Research Scientist  
**Investigator:** Tapio Kujala      **Title:** Research Scientist

**Discipline:** H herbicide  
**Trial Status:** F one-year/final  
**Initiation Date:** 05/05/15      **Planned Completion Date:** 30/11/15

**Trial Location**  
**City:** Ylistaro      **Latitude of LL Corner °:** 62.96269 N FIN 70.088882 -59.804993  
**Longitude of LL Corner °:** 22.53221 E      19.510555 -31.588928  
**Postal Code:** FI-61400  
**Country:** FIN  
**Map Reference:** WGS 84

**Conducted Under GEP:** Yes

No.	Guideline	Description
1.	PP 1/93(3)	weeds in cereals
2.	PP 1/135(3)	Phytotoxicity assessment
3.	PP 1/152(4)	Design and analysis of efficacy evaluation trials
4.	PP 1/181(4)	Conduct and reporting of efficacy evaluation trials including good experimental

### Objectives:

Prioritary target:  
 GALSP, other BLW  
 Weeds minimum 5 / m2/species

### Conclusions:

Edel barley variety was drilled on May 23<sup>rd</sup> 2015 on loamy sand soil in Ylistaro, South Ostrobothnia. Weed infestation with CHEAL (*Chenopodium album*), STEME (*Stellaria media*), GALSP (*Galium spurium*), GAESS (*Galeopsis* spp) and MATIN (*Tripleurospermum inodorum*) occurred at the application time in the trial, every species was found more than 5 per square meter. Dense and even barley trial was fertilized with high amount of Nitrogen (150 kg/ha) and crop competed well with weeds.

The growing season was cool and rainy until August. The mean temperature of June and July was 1.6 and 1.4 °C lower, respectively, than the long term normal mean temperature in Ylistaro. For two weeks before the application time it rained 55 mm in total. Humid conditions and very dense and vigorous barley crop stand increased the efficacy of tested treatments. Herbicide applications were made on June 26<sup>th</sup> 2015 (14.3 °C, 72 % RH) at BBCH stage 25-31 of barley.

Phytotoxicity was assessed three times: 7, 14 and 28 days after the application (DA-A). Bleaching and/or stunting of crop were found one week after application in eight herbicide treatments sprayed with most of sulfonylureas and Ariane S. Bleaching varied between 3 and 15 % and values were highest in the plots sprayed with Primus XL plus Premium Classic and Cleave. Shortening of barley was remarkable in the plots sprayed with Cleave still one month after application (9 %). Weed efficacy was assessed twice, one and two months after the application. Every treatment controlled the weeds 100 % in the humid weather conditions in the barley crop with extremely high ability to compete with the broad leaved weeds existed. Farmer estimated the barley yield level to be about 6 tn/ha.

### Personnel

**Study Director:** Sanni Junnilla      **Title:** Research Scientist  
**Affiliation:** Natural Resources Institute Finland (Luke)  
**Address:** Laboratorium, Uutetie 2  
**Location:** Jokioinen, Finland  
**Postal Code:** FI-31600      **E-mail:** sanni.junnilla@luke.fi  
**Phone No.:** +358 29 532 6183  
**Investigator:** Tapio Kujala      **Title:** Research Scientist  
**Affiliation:** Natural Resources Institute Finland (Luke)  
**Address:** Alapääntie 104  
**Location:** Ylistaro, Finland  
**Postal Code:** FI-61400      **E-mail:** tapio.kujala@luke.fi  
**Phone No.:** +358 29 532 6279

## Natural Resources Institute Finland (Luke)

### Weed control in barley, public advisory trial

Trial ID: H-15-050-20 Protocol ID: H-15-050-20  
 Location: Ylistaro Study Director: Sanni Junnilla/Tapio Kujala  
 Project ID: Investigator: Sanni Junnilla  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

### Cooperator/Landowner

Cooperator: Heikki Kuoppala Role: Farmer  
 Address 1: Munakantie 1  
 Address 2: Halkosaari Phone No.: +358445804221  
 City: Ylistaro  
 Postal Code: FI-60560 E-mail: kitinojankauppaoy@netikka.fi  
 Country: FIN South Ostrobothnia

### Crop Description

Crop 1: HORVS Hordeum vulgare (spring) Spring barley  
 Variety: Edel  
 BBCH Scale: BCER Planting Date: 23/05/15  
 Planting Method: DRILLE drilled Rate, Unit: 480 S/M2  
 Depth, Unit: 4 cm  
 Row Spacing, Unit: 12.5 cm  
 Seed Bed: FINE fine  
 Soil Moisture: DAMP damp

### Pest Description

Pest 1 Type: W Code: GALSP Galium spurium  
 Common Name: False cleavers  
 Pest 2 Type: W Code: CHEAL Chenopodium album  
 Common Name: Common lambsquarters  
 Pest 3 Type: W Code: GAESS Galeopsis sp.  
 Common Name: Hempnettle  
 Pest 4 Type: W Code: STEME Stellaria media  
 Common Name: Common chickweed  
 Pest 5 Type: W Code: MATIN Tripleurospermum mar. inodorum  
 Common Name: False chamomille

### Site and Design

Plot Width, Unit: 2 m Site Type: FIELD field  
 Plot Length, Unit: 8 m Experimental Unit: 1 PLOT plot  
 Plot Area, Unit: 16 m<sup>2</sup> Tillage Type: REDTIL reduced-till  
 Replications: 4 Study Design: RACOB L Randomized Complete Block (RCB)  
 Untreated Arrangement: INCLUDED single control randomized in each block

No.	Previous Crop	Previous Pesticides	Year
1.	spring wheat	Sekator 0,1+MCPA 1 l/ha	2014
2.	spring wheat	Sekator 0,1+MCPA 1 l/ha	2013

### Maintenance

No.	Date	Maintenance Treatment Name	Rate	Rate Unit
1.	23/05/15	Belor (N:27 P:3 K:5)	200	kg/ha
2.	23/05/15	Chicken manure (N: 2,7 P:3,6)	15	m3/ha

### Soil Description

pH: 6.9 Texture: LS loamy sand  
 Fert. Level: E excellent  
 Soil Drainage: E excellent



## Natural Resources Institute Finland (Luke)

### Weed control in barley, public advisory trial

Trial ID: H-15-050-20      Protocol ID: H-15-050-20  
 Location: Ylistaro      Study Director: Sanni Junnilla/Tapio Kujala  
 Project ID:      Investigator: Sanni Junnilla  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

### Additional Measured Elements

Element	Quantity	Unit
Ca	3000	mg/l
P	21.2	mg/l
K	400	mg/l
Mg	220	mg/l
Cu	6.9	mg/l
Mn	23	mg/l
Zn	3	mg/l

### Moisture and Weather Conditions

Overall Moisture Conditions: WEWEDR wet-wet-dry  
 Closest Weather Station: PELMAA Observatory      Distance, Unit: 2.5 km

### Application Description

	A
Application Date:	26/06/15
Time of Day:	8:15 am
Application Method:	SPRAY
Application Timing:	POEMSL
Application Placement:	BROFOL
Applied By:	VH,JJ,HL
Air Temperature, Unit:	14.3 C
% Relative Humidity:	72
Wind Velocity, Unit:	2 MPS
Dew Presence (Y/N):	Y yes
Soil Moisture:	DAMP
% Cloud Cover:	40
Next Rain Occurred On:	29/06/15

### Crop Stage At Each Application

	A
Crop 1 Code, BBCH Scale:	HORVS BCER
Stage Scale Used:	BBCH
Stage Majority, Percent:	25
Stage Maximum, Percent:	31
Height, Unit:	27 cm
Height Minimum, Maximum:	20 34
Crop coverage (%):	55

## Natural Resources Institute Finland (Luke)

### Weed control in barley, public advisory trial

Trial ID: H-15-050-20      Protocol ID: H-15-050-20  
 Location: Ylistaro      Study Director: Sanni Junnilla/Tapio Kujala  
 Project ID:      Investigator: Sanni Junnilla  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

### Pest Stage At Each Application

	A
<b>Pest 1 Code, Type, Scale:</b>	GALSP W BBCH
<b>Stage Minimum, Percent:</b>	25
<b>Stage Maximum, Percent:</b>	33
<b>Height, Unit:</b>	9 cm
<b>Height Minimum, Maximum:</b>	4 14
<b>Pest 2 Code, Type, Scale:</b>	CHEAL W BBCH
<b>Stage Minimum, Percent:</b>	16
<b>Height, Unit:</b>	6 cm
<b>Height Minimum, Maximum:</b>	5 7
<b>Pest 3 Code, Type, Scale:</b>	GAESS W BBCH
<b>Stage Minimum, Percent:</b>	14
<b>Stage Maximum, Percent:</b>	16
<b>Height, Unit:</b>	8 cm
<b>Height Minimum, Maximum:</b>	5 10
<b>Pest 4 Code, Type, Scale:</b>	STEME W BBCH
<b>Stage Minimum, Percent:</b>	20
<b>Stage Maximum, Percent:</b>	32
<b>Height, Unit:</b>	4 cm
<b>Height Minimum, Maximum:</b>	2 6
<b>Pest 5 Code, Type, Scale:</b>	MATIN W BBCH
<b>Stage Minimum, Percent:</b>	16
<b>Stage Maximum, Percent:</b>	18
<b>Height, Unit:</b>	11 cm
<b>Height Minimum, Maximum:</b>	10 12

### Application Equipment

	A
<b>Appl. Equipment:</b>	Plot sprayer
<b>Equipment Type:</b>	SPRAYE
<b>Operation Pressure, Unit:</b>	2.9 bar
<b>Nozzle Type:</b>	015-110
<b>Nozzle Size:</b>	015
<b>Nozzle Spacing, Unit:</b>	50 cm
<b>Nozzles/Row:</b>	4
<b>Boom ID:</b>	EPO1
<b>Boom Length, Unit:</b>	2 m
<b>Boom Height, Unit:</b>	50 cm
<b>Ground Speed, Unit:</b>	1 mps
<b>Spray Volume, Unit:</b>	200 l/ha
<b>Mix Size, Unit:</b>	2.3 liters
<b>Propellant:</b>	COMAIR

## Natural Resources Institute Finland (Luke)

### Weed control in barley, public advisory trial

Trial ID: H-15-050-20      Protocol ID: H-15-050-20  
 Location: Ylistaro      Study Director: Sanni Junnilla/Tapio Kujala  
 Project ID:      Investigator: Sanni Junnilla  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

Pest Code	HORVS		HORVS		GALSP		CHEAL		
Crop Code	HORVS		HORVS		HORVS		HORVS		
BBCH Scale	BCER		BCER		BCER		BCER		
Crop Variety	Edel		Edel		Edel		Edel		
Description			height 100 cm		height 100 cm		height 100 cm		
Part Rated	PLANT C		PLANT C		PLANT P		PLANT P		
Rating Date	03/07/15		09/07/15		24/07/15		24/07/15		
Rating Type	PHYBLE		PHYBLE		PHYSTU		CONTRO		
Rating Unit	%		%		%		%		
Sample Size, Unit	1	PLOT	1	PLOT	1	PLOT	1	PLOT	
Number of Subsamples	1		1		1		1		
Crop Stage Majority			65		65		65		
Crop Stage Scale			BBCH		BBCH		BBCH		
Crop Density, Unit	90 %		90 %		90 %		90 %		
Assessed By	SJ,MH		SJ,MH		TK		TK		
Days After First/Last Applic.	7 7		13 13		28 28		28 28		
Trt-Eval Interval	7 DA-A		13 DA-A		28 DA-A		28 DA-A		
Plant-Eval Interval	41 DP-1		47 DP-1		62 DP-1		62 DP-1		
ARM Action Codes	P		P		P		P		
Trt No.	Treatment Name	Rate	Unit	Appl Code	1	2	3	4	5
1	Untreated Check				0 a	0 a	0 b	0 b	0 b
2	Express 50 SX Starane 180 Sito Plus	15 g/ha 0.5 L/ha 0.1 L/ha	A A A		10 a	0 a	0 b	100 a	100 a
3	Mustang Forte	0.75 L/ha	A		0 a	0 a	0 b	100 a	100 a
4	Ariane S	2.0 L/ha	A		10 a	0 a	0 b	100 a	100 a
5	Sekator OD Sito Plus	100 mL/ha 0.1 L/ha	A A		0 a	0 a	0 b	100 a	100 a
6	Sekator OD Sito Plus	150 mL/ha 0.1 L/ha	A A		3 a	0 a	0 b	100 a	100 a
7	Starane 180 Sekator OD Sito Plus	0.5 L/ha 75 mL/ha 0.1 L/ha	A A A		13 a	0 a	0 b	100 a	100 a
8	Sekator OD Nufarm MCPA 750	75 mL/ha 0.75 L/ha	A A		0 a	0 a	0 b	100 a	100 a
9	Tooler Viljelyohjelma -kiinnite	50 g/ha 0.1 L/ha	A A		0 a	0 a	0 b	100 a	100 a
10	Biathlon 4D Sito Plus	50 g/ha 0.1 L/ha	A A		3 a	0 a	0 b	100 a	100 a
11	Logran 20 WG Duplosan Meko	20 g/ha 1.5 L/ha	A A		0 a	0 a	0 b	100 a	100 a
12	Primus XL Premium Classic	0.75 L/ha 12.5 g/ha	A A		15 a	0 a	0 b	100 a	100 a
13	Trimmer 500 WG Tomahawk 180 EC Sito Plus	7.5 g/ha 0.4 L/ha 0.1 L/ha	A A A		8 a	0 a	0 b	100 a	100 a
14	Cleave	1.0 L/ha	A		15 a	0 a	9 a	100 a	100 a
LSD P=.05					8.8	.	0.4	.	.
Standard Deviation					6.2	0.0	0.3	0.0	0.0
CV					115.49	0.0	48.01	0.0	0.0
Bartlett's X2					3.095	0.0	0.0	0.0	0.0
P(Bartlett's X2)					0.876	.	.	.	.
Replicate F					0.062	0.000	1.000	0.000	0.000
Replicate Prob(F)					0.9794	1.0000	0.4031	1.0000	1.0000
Treatment F					3.804	0.000	243.000	0.000	0.000
Treatment Prob(F)					0.0006	1.0000	0.0001	1.0000	1.0000

Means followed by same letter do not significantly differ (P=.05, Student-Newman-Keuls)

Could not calculate LSD (% mean diff) for columns 2,4,5,6,7,8,9,10,11,12,13 because error mean square = 0.



## Natural Resources Institute Finland (Luke)

### Weed control in barley, public advisory trial

Trial ID: H-15-050-20      Protocol ID: H-15-050-20  
 Location: Ylistaro      Study Director: Sanni Junnilla/Tapio Kujala  
 Project ID:      Investigator: Sanni Junnilla  
 Sponsor Contact: Adama, Agrimarket, Basf, Bayer, Dow

Pest Code				GAESS		STEME		MATIN
Crop Code				HORVS		HORVS		HORVS
BBCH Scale				BCER		BCER		BCER
Crop Variety				Edel		Edel		Edel
Description				height 100 cm		height 100 cm		height 100 cm
Part Rated				PLANT P		PLANT P		PLANT P
Rating Date				21/08/15		21/08/15		21/08/15
Rating Type				CONTRO		CONTRO		CONTRO
Rating Unit				%		%		%
Sample Size, Unit				1 PLOT		1 PLOT		1 PLOT
Number of Subsamples				1		1		1
Crop Stage Majority				85		85		85
Crop Stage Scale				BBCH		BBCH		BBCH
Crop Density, Unit				85 %		85 %		85 %
Assessed By				TK		TK		TK
Days After First/Last Applic.				56 56		56 56		56 56
Trt-Eval Interval				56 DA-A		56 DA-A		56 DA-A
Plant-Eval Interval				90 DP-1		90 DP-1		90 DP-1
ARM Action Codes				P		P		P
Trt No.	Treatment Name	Rate	Appl Code	11		12		13
		Rate Unit						
1	Untreated Check			0 b		0 b		0 b
2	Express 50 SX	15 g/ha	A	100 a		100 a		100 a
	Starane 180	0.5 L/ha	A					
	Sito Plus	0.1 L/ha	A					
3	Mustang Forte	0.75 L/ha	A	100 a		100 a		100 a
4	Ariane S	2.0 L/ha	A	100 a		100 a		100 a
5	Sekator OD	100 mL/ha	A	100 a		100 a		100 a
	Sito Plus	0.1 L/ha	A					
6	Sekator OD	150 mL/ha	A	100 a		100 a		100 a
	Sito Plus	0.1 L/ha	A					
7	Starane 180	0.5 L/ha	A	100 a		100 a		100 a
	Sekator OD	75 mL/ha	A					
	Sito Plus	0.1 L/ha	A					
8	Sekator OD	75 mL/ha	A	100 a		100 a		100 a
	Nufarm MCPA 750	0.75 L/ha	A					
9	Tooler	50 g/ha	A	100 a		100 a		100 a
	Viljelyohjelma -kiinnite	0.1 L/ha	A					
10	Biathlon 4D	50 g/ha	A	100 a		100 a		100 a
	Sito Plus	0.1 L/ha	A					
11	Logran 20 WG	20 g/ha	A	100 a		100 a		100 a
	Duplosan Meko	1.5 L/ha	A					
12	Primus XL	0.75 L/ha	A	100 a		100 a		100 a
	Premium Classic	12.5 g/ha	A					
13	Trimmer 500 WG	7.5 g/ha	A	100 a		100 a		100 a
	Tomahawk 180 EC	0.4 L/ha	A					
	Sito Plus	0.1 L/ha	A					
14	Cleave	1.0 L/ha	A	100 a		100 a		100 a
LSD P=.05				.		.		.
Standard Deviation				0.0		0.0		0.0
CV				0.0		0.0		0.0
Bartlett's X2				0.0		0.0		0.0
P(Bartlett's X2)				.		.		.
Replicate F				0.000		0.000		0.000
Replicate Prob(F)				1.0000		1.0000		1.0000
Treatment F				0.000		0.000		0.000
Treatment Prob(F)				1.0000		1.0000		1.0000

Maa- ja elintarviketalouden tutkimuskeskus MTT  
Kasvintuotannon tutkimus  
Torjunta-ainetarkastus- ja testaus (TAT)  
31600 Jokioinen

## Muutos kasvinsuojeluaineiden testauksia suorittavan laitoksen viralliseen hyväksymiseen

- HAKIJA** Maa- ja elintarviketalouden tutkimuskeskus, kasvintuotannon tutkimus, torjunta-ainetarkastus ja -testaus (TAT)
- HAKEMUS** Maa- ja elintarviketalouden tutkimuskeskus, kasvintuotannon tutkimus, torjunta-ainetarkastus ja -testaus (TAT) on hakenut kasvinsuojeluaineiden biologista tehokkuutta ja käyttökelpoisuutta testaavan laitoksen virallisen hyväksymisensä siirtämistä 1.1.2015 aloittavalle Luonnonvarakeskus (Luke), luonnonvarat ja biotuotanto ja sen elinympäristö ja ekologia-ryhmälle. Uusi organisaatio muodostetaan yhdistämällä Maa- ja elintarviketalouden tutkimuskeskus (MTT), Metsäntutkimuslaitos (Metla), Riista- ja kalatalouden tutkimuslaitos (RKTL) ja maa- ja metsätalousministeriön tietopalvelukeskus (Tike) Luonnonvarakeskukseksi.
- PÄÄTÖS** Turvallisuus- ja kemikaalivirasto, Tukes hyväksyy esitetyn muutoksen, jolla Luonnonvarakeskus, luonnonvarat ja biotuotanto ja sen elinympäristö ja ekologia-ryhmä jatkaa uudessa organisaatiossa aiemmin Maa- ja elintarviketalouden tutkimuskeskukselle, kasvintuotannon tutkimus, torjunta-ainetarkastus ja -testaus (TAT) annetun hyväksymisen nojalla kasvinsuojeluaineiden biologista tehokkuutta ja käyttökelpoisuutta testaavana laitoksena. Testaustoiminnassa noudatetaan kansainvälisiä periaatteita (Good Experimental Practice, GEP). Hyväksyminen koskee laboratorio- ja kenttäkokeita.
- Kasvinsuojeluaineiden testauksia suorittava virallisesti hyväksytty laitos (GEP) on 1.1.2015 lähtien:
- Luonnonvarakeskus  
Luonnonvarat ja biotuotanto  
Elinympäristö ja ekologia  
31600 Jokioinen
- Tämä päätös korvaa aikaisemmin 14.9.2011 annetun päätöksen.
- PERUSTELUT** Turvallisuus- ja kemikaalivirasto, Tukes on arvioinut, että toiminnan siirtyminen uudelle organisaatiolle täyttää edelleen GEP-toiminnalle asetetut vaatimukset, koska testaushenkilökunta siirtyy tähän organisaatioon ja toimintaa jatketaan voimassa olevien vakioitujen toimintaohjeiden mukaisesti.

**VOIMASSAOLO** Muutos on voimassa 1.1.2015 alkaen. Kasvinsuojeluaineiden testauksia suorittavan laitoksen virallinen hyväksyminen on voimassa 3.2.2017 saakka.

**SOVELLETUT OIKEUSOHJEET**

Laki kasvinsuojeluaineista (1563/2011) § 18  
Maa- ja metsätalousministeriön asetus 9/12 kasvinsuojeluaineiden käyttöä koskevasta tutkinnosta, tarkastuksia suorittavien laitosten hyväksymisestä sekä koe- ja tutkimustoiminnasta

**MUUTOKSENHAKU** Tähän päätökseen voi hakea muutosta valittamalla korkeimpaan hallinto-oikeuteen.

**MAKSU** Muutoksesta peritään työ- ja elinkeinoministeriön asetuksen N:o 636/2013 mukaisesti 250 euron suuruinen maksu. Lasku toimitetaan myöhemmin.

Ryhmäpäällikkö

  
Kaija Kallio-Mannila

Ylitarkastaja

  
Jouni Rokkanen

**LIITTEET** Valitusosoitus





# JOKIOINEN

## WEATHER CONDITIONS IN JOKIOINEN 2015. DATA FROM THE OBSERVATORY OF JOKIOINEN

(location 60.81402°N, 23.49829°E according to map datum WGS 84, altitude 104 m). Data source: Finnish Meteorological Institute

April								
Date	Temperature				Precipitation		Relative humidity	
	Effective			Surface Min °C	Sum mm	Sum mm	(mean) %	
	Mean °C	temp. sum °C	Max °C					
1	2.1	0.0	4.4	0.1	-2.7	0.8	0.8	86
2	1.8	0.0	3.7	1.2	1.1	0.0	0.8	84
3	1.4	0.0	3.1	0.3	-0.7	0.3	1.1	77
4	1.9	0.0	4.7	0.4	-0.3	1.8	2.9	86
5	2.0	0.0	6.3	-0.5	-3.2	0.0	2.9	88
6	2.3	0.0	7.5	-3.8	-8.3	0.0	2.9	66
7	4.4	0.0	9.8	1.2	0.6	0.7	3.6	91
8	5.2	0.2	8.0	3.1	0.8	0.0	3.6	48
9	6.7	1.9	12.0	2.1	-0.2	0.0	3.6	39
10	6.5	3.4	11.0	0.4	-2.2	0.0	3.6	46
11	7.9	6.3	14.6	0.6	-4.1	0.0	3.6	40
12	6.3	7.6	14.9	3.4	-0.8	1.7	5.3	90
13	4.5	7.6	10.3	1.1	-0.1	1.0	6.3	53
14	1.2	7.6	5.1	-0.1	-0.2	1.1	7.4	83
15	2.0	7.6	6.8	-2.1	-6.0	0.7	8.1	60
16	2.3	7.6	6.3	-2.0	-6.4	2.4	10.5	86
17	3.3	7.6	7.4	0.5	-0.1	0.2	10.7	74
18	2.3	7.6	5.8	-1.5	-3.6	0.0	10.7	60
19	5.8	8.4	10.4	-1.4	-4.5	0.0	10.7	64
20	6.8	10.2	11.9	1.6	-0.2	0.0	10.7	38
21	7.6	12.8	12.7	0.9	-4.1	0.0	10.7	39
22	4.9	12.8	9.9	-0.5	-4.6	1.0	11.7	52
23	5.7	13.5	9.1	3.8	1.9	0.0	11.7	45
24	3.2	13.5	7.1	-1.0	-4.5	0.0	11.7	50
25	5.8	14.3	12.5	-3.8	-9.6	2.4	14.1	28
26	6.3	15.6	9.8	4.2	2.9	3.2	17.3	98
27	6.7	17.3	10.7	2.2	2.6	6.0	23.3	61
28	8.0	20.3	13.3	5.0	5.6	0.0	23.3	48
29	4.0	20.3	7.7	1.6	2.3	19.1	42.4	93
30	5.5	20.8	10.3	1.3	0.8	0.0	42.4	73
Month	4.5					42.4		
Normal 1981-2010	3.5	26.4				30.0		

May								
Date	Temperature				Precipitation		Relative humidity	
	Effective			Surface Min °C	Sum mm	Sum mm	(mean) %	
	Mean °C	temp. sum °C	Max °C					
1	9.0	24.8	14.4	3.8	2.5	0.0	0.0	46
2	7.2	27.0	10.3	4.0	0.2	0.0	0.0	72
3	5.7	27.7	10.8	0.4	-3.9	1.0	1.0	69
4	6.0	28.7	12.4	-3.6	-8.8	0.0	1.0	33
5	8.9	32.6	12.4	4.3	2.0	0.0	1.0	55
6	9.5	37.1	12.9	5.7	4.1	7.5	8.5	97
7	10.9	43.0	16.3	5.2	3.9	1.6	10.1	61
8	7.4	45.4	13.0	5.5	1.2	0.1	10.2	58
9	6.2	46.6	10.8	3.5	0.7	0.0	10.2	64
10	7.6	49.2	13.1	-1.1	-6.3	2.1	12.3	38
11	8.0	52.2	13.6	5.2	5.3	2.1	14.4	68
12	8.2	55.4	10.1	6.5	5.3	16.5	30.9	90
13	7.1	57.5	9.6	5.3	7.3	6.4	37.3	94
14	7.6	60.1	12.4	5.1	4.7	0.1	37.4	60
15	4.8	60.1	9.4	0.8	-2.5	3.3	40.7	73
16	6.7	61.8	12.2	0.9	-3.6	0.0	40.7	58
17	8.3	65.1	12.3	1.1	-3.1	0.1	40.8	55
18	7.6	67.7	12.3	2.5	-1.6	0.0	40.8	60
19	10.5	73.2	16.2	5.1	1.5	0.7	41.5	48
20	10.5	78.7	15.4	6.5	5.9	0.0	41.5	57
21	10.4	84.1	15.0	7.0	4.1	0.6	42.1	60
22	10.7	89.8	16.9	3.0	-1.7	1.8	43.9	42
23	9.4	94.2	12.9	7.9	6.7	0.0	43.9	54
24	9.0	98.2	14.3	3.9	0.9	0.0	43.9	38
25	11.1	104.3	16.7	3.0	-0.7	0.0	43.9	53
26	11.7	111.0	16.8	3.6	-1.7	1.8	45.7	54
27	11.6	117.6	16.7	7.7	6.3	0.0	45.7	55
28	11.8	124.4	17.6	4.3	-0.2	0.0	45.7	42
29	9.5	128.9	13.7	6.6	3.8	3.6	49.3	90
30	12.1	136.0	16.8	5.4	1.2	0.1	49.4	37
31	10.9	141.9	14.7	8.8	8.5	0.0	49.4	44
Month	8.9					49.4		
Normal 1981-2010	9.8	163.6				41.0		

# JOKIOINEN

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(location 60.81402°N, 23.49829°E according to map datum WGS 84, altitude 104 m). Data source: Finnish Meteorological Institute

June								
Date	Temperature				Precipitation		Relative humidity	
	Mean °C	Effective	Max °C	Min °C	Surface Min °C	mm	Sum mm	(mean) %
		temp. sum °C						
1	10.8	147.7	14.7	7.7	6.4	1.8	1.8	77
2	12.0	154.7	16.8	6.8	4.6	3.3	5.1	39
3	10.9	160.6	13.7	8.2	8.8	5.6	10.7	75
4	10.8	166.4	14.4	7.1	5.5	0.0	10.7	55
5	11.5	172.9	16.7	5.5	1.7	0.0	10.7	35
6	12.6	180.5	17.8	2.3	-1.8	0.4	11.1	65
7	11.9	187.4	16.2	9.8	8.4	2.2	13.3	59
8	11.2	193.6	16.3	6.6	2.5	0.0	13.3	41
9	11.0	199.6	16.6	4.1	-0.8	0.0	13.3	37
10	12.2	206.8	17.3	4.5	0.4	0.0	13.3	35
11	11.8	213.6	14.4	8.8	6.8	0.4	13.7	36
12	14.6	223.2	22.4	8.5	7.4	0.2	13.9	49
13	15.8	234.0	22.5	7.9	3.1	1.5	15.4	33
14	11.8	240.8	17.8	9.8	8.3	1.6	17.0	97
15	10.1	245.9	13.4	8.5	8.7	0.9	17.9	50
16	9.6	250.5	12.9	6.0	3.3	0.0	17.9	49
17	11.4	256.9	16.1	4.8	2.5	0.6	18.5	37
18	10.2	262.1	14.2	8.6	6.7	13.8	32.3	95
19	12.8	269.9	16.2	10.6	10.0	0.0	32.3	79
20	11.9	276.8	17.1	4.9	2.0	13.6	45.9	84
21	13.2	285.0	17.6	8.1	4.4	0.3	46.2	63
22	12.4	292.4	16.6	8.6	5.7	0.4	46.6	89
23	14.3	301.7	20.0	7.0	4.9	10.9	57.5	54
24	13.7	310.4	17.0	11.8	11.9	8.0	65.5	87
25	12.7	318.1	15.6	11.4	11.5	0.0	65.5	78
26	12.2	325.3	16.2	6.0	2.1	11.8	77.3	85
27	12.4	332.7	16.5	9.5	9.5	0.5	77.8	77
28	15.6	343.3	20.8	11.0	10.5	0.0	77.8	48
29	16.8	355.1	22.3	10.7	10.1	1.0	78.8	35
30	14.6	364.7	19.5	12.6	11.8	8.8	87.6	73
Month	12.4					87.6		
Normal 1981-2010	14.0	437.9				63.0		

July								
Date	Temperature				Precipitation		Relative humidity	
	Mean °C	Effective	Max °C	Min °C	Surface Min °C	mm	Sum mm	at 3 p.m. %
		temp. sum °C						
1	16.4	376.1	21.7	11.3	10.5	0.0	0.0	37
2	19.0	390.1	26.2	8.1	4.3	0.0	0.0	45
3	21.8	406.9	28.3	16.4	14.7	0.0	0.0	39
4	19.9	421.8	25.6	15.3	14.2	0.0	0.0	55
5	17.3	434.1	22.0	11.2	8.3	0.0	0.0	49
6	15.2	444.3	19.8	9.9	5.7	9.0	9.0	53
7	13.4	452.7	15.3	10.2	9.3	10.4	19.4	95
8	14.7	462.4	17.4	13.2	12.6	1.9	21.3	92
9	15.0	472.4	19.0	13.9	13.3	3.5	24.8	78
10	13.6	481.0	15.7	10.9	9.2	1.3	26.1	76
11	14.0	490.0	19.2	8.7	5.6	5.3	31.4	91
12	12.1	497.1	15.8	9.4	7.6	0.1	31.5	75
13	13.3	505.4	18.0	8.4	5.4	0.9	32.4	62
14	14.8	515.2	19.3	9.6	7.1	0.0	32.4	59
15	15.7	525.9	21.2	8.8	5.4	0.0	32.4	48
16	14.2	535.1	19.1	10.9	8.1	12.0	44.4	72
17	15.1	545.2	20.1	12.5	12.2	0.0	44.4	67
18	14.2	554.4	20.4	8.4	5.4	2.0	46.4	67
19	14.0	563.4	16.6	11.9	11.0	0.1	46.5	80
20	14.3	572.7	19.9	8.0	4.5	0.0	46.5	66
21	15.3	583.0	20.9	8.2	5.5	15.7	62.2	71
22	14.0	592.0	18.3	11.5	11.4	0.3	62.5	75
23	13.6	600.6	18.7	6.8	4.0	2.3	64.8	74
24	13.9	609.5	17.4	13.0	12.5	2.0	66.8	94
25	15.4	619.9	20.5	9.0	5.1	2.4	69.2	43
26	14.9	629.8	18.5	12.5	11.9	1.6	70.8	98
27	14.0	638.8	16.1	13.1	12.1	1.5	72.3	79
28	14.6	648.4	20.6	8.1	4.3	0.0	72.3	48
29	15.2	658.6	19.6	9.9	7.9	0.1	72.4	63
30	15.0	668.6	18.8	12.0	9.0	0.4	72.8	66
31	13.6	677.2	16.5	12.6	12.1	1.9	74.7	76
Month	15.1					74.7		
Normal 1981-2010	16.7	809.5				75.0		

# JOKIOINEN

## WEATHER CONDITIONS IN JOKIOINEN 2015. DATA FROM THE OBSERVATORY OF JOKIOINEN

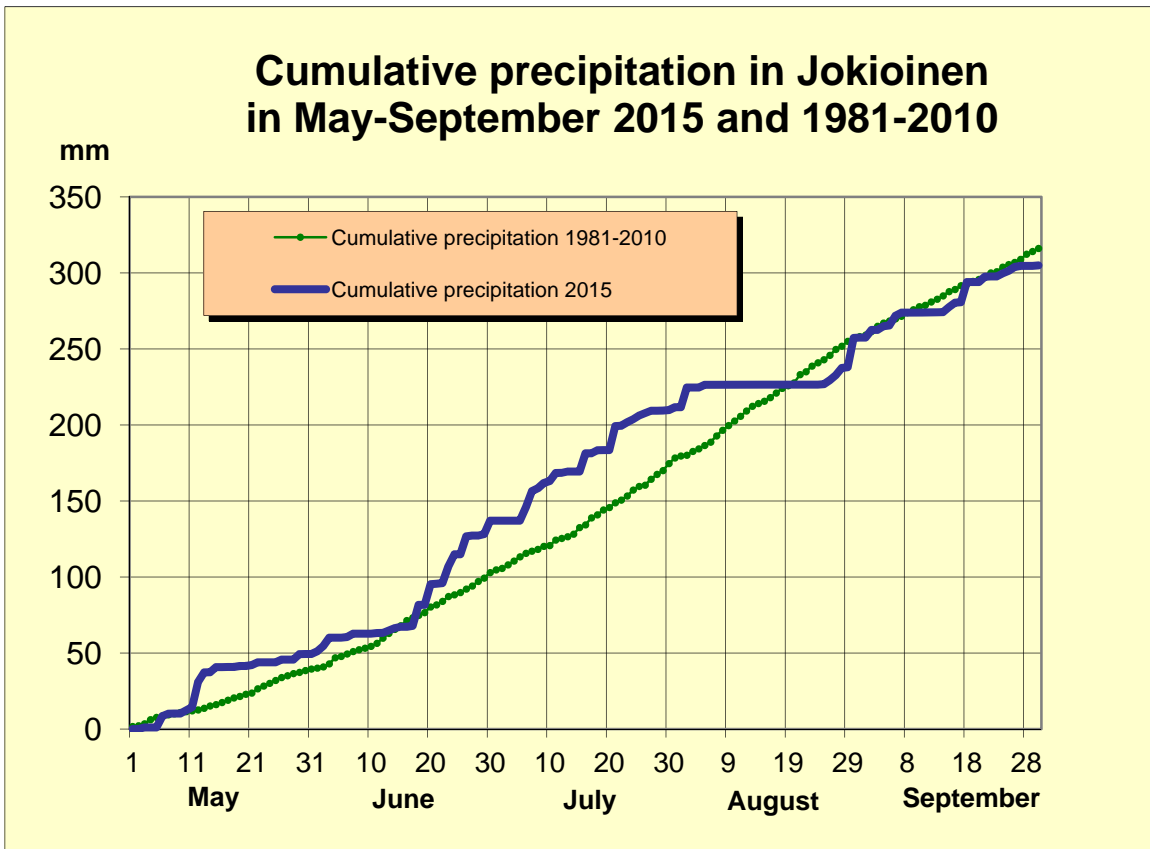
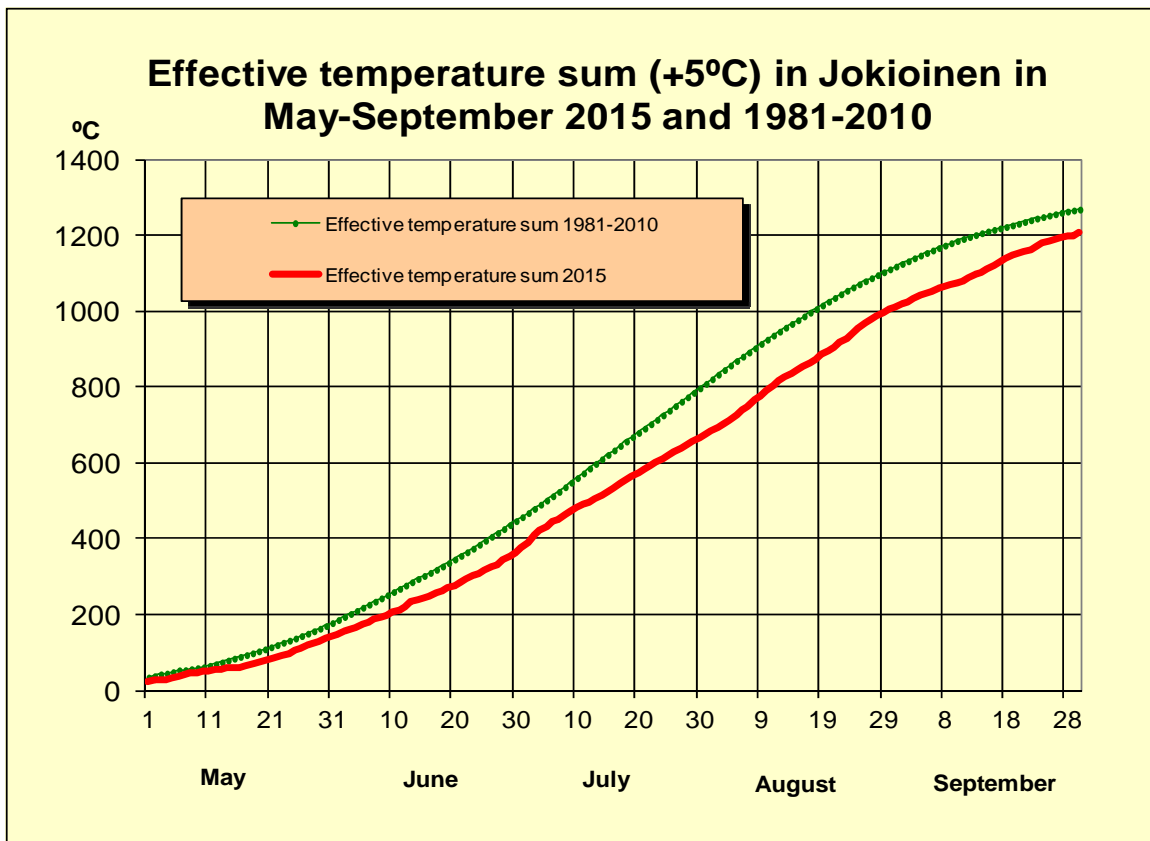
(location 60.81402°N, 23.49829°E according to map datum WGS 84, altitude 104 m). Data source: Finnish Meteorological Institute.

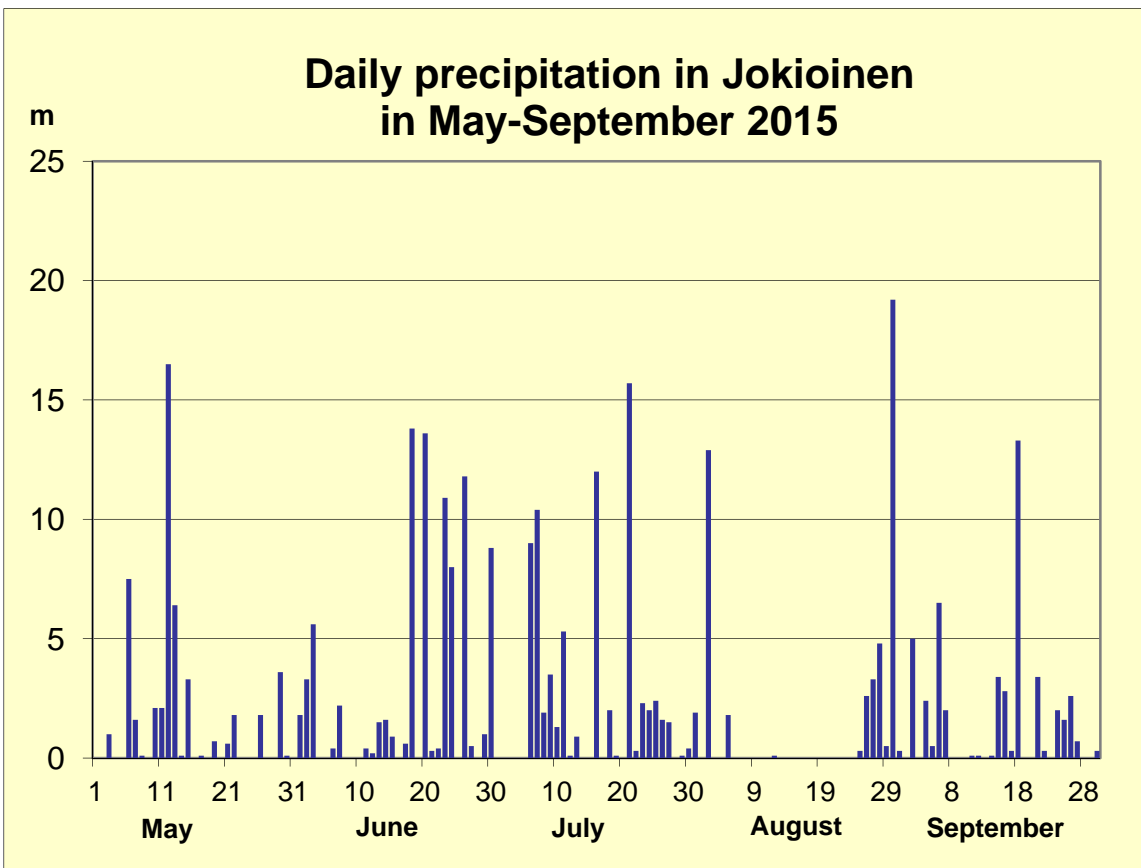
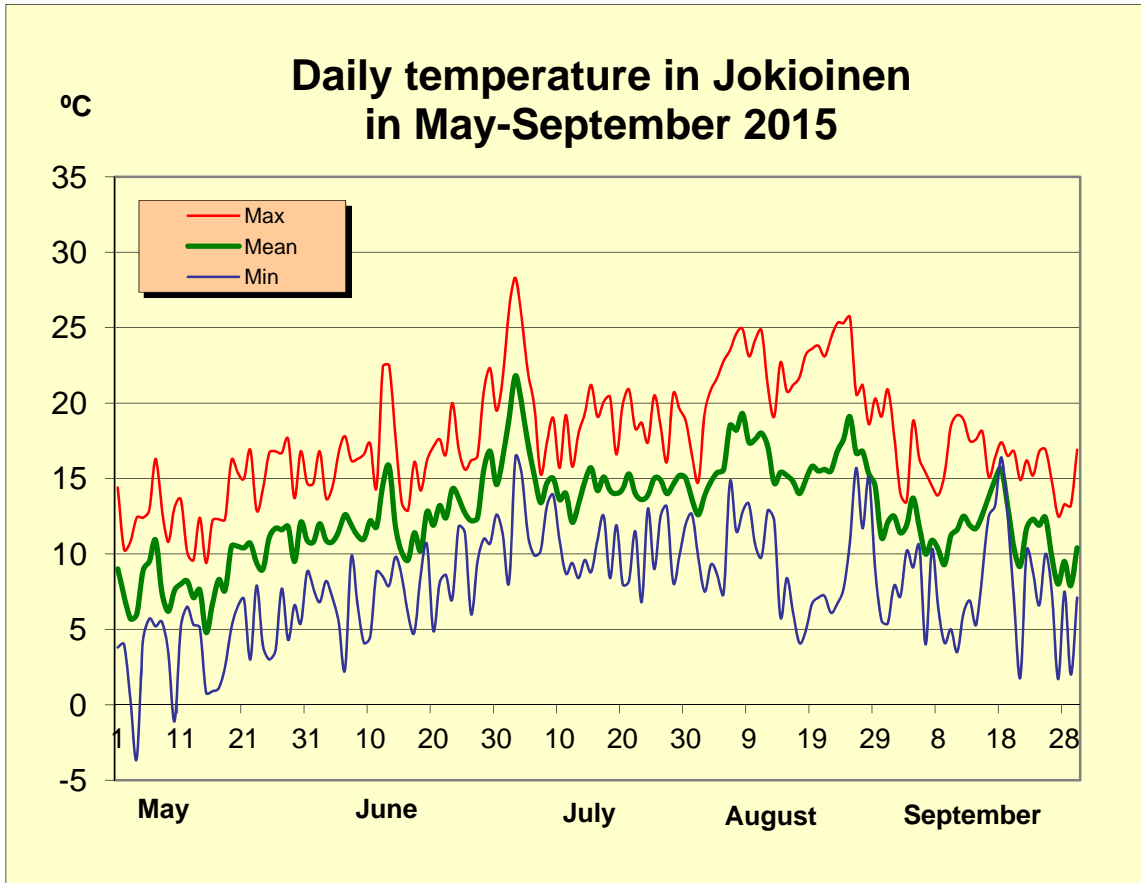
### August

Date	Temperature					Precipitation		Relative humidity at 3 p.m. %
	Effective			Surface		mm	Sum mm	
	Mean °C	temp. sum °C	Max °C	Min °C	Min °C			
1	12.6	684.8	14.8	9.7	7.0	0.0	0.0	78
2	13.9	693.7	19.4	7.5	2.9	12.9	12.9	52
3	14.8	703.5	20.9	9.3	6.6	0.0	12.9	49
4	15.4	713.9	21.7	8.6	5.1	0.0	12.9	50
5	15.6	724.5	22.8	7.4	4.0	1.8	14.7	42
6	18.5	738.0	23.5	14.8	13.3	0.0	14.7	69
7	18.2	751.2	24.6	11.5	6.9	0.0	14.7	53
8	19.3	765.5	24.9	12.8	8.9	0.0	14.7	63
9	17.4	777.9	23.1	13.3	11.9	0.0	14.7	54
10	17.6	790.5	24.2	10.6	7.2	0.0	14.7	37
11	18.0	803.5	24.8	9.8	6.4	0.0	14.7	45
12	17.1	815.6	21.1	12.9	10.1	0.1	14.8	66
13	14.7	825.3	19.1	12.2	8.3	0.0	14.8	50
14	15.4	835.7	22.7	5.8	2.2	0.0	14.8	48
15	15.2	845.9	20.8	8.4	4.1	0.0	14.8	53
16	14.8	855.7	21.2	6.1	1.6	0.0	14.8	31
17	14.0	864.7	21.7	4.1	0.1	0.0	14.8	41
18	14.9	874.6	23.2	4.9	1.0	0.0	14.8	38
19	15.8	885.4	23.6	6.7	3.0	0.0	14.8	34
20	15.5	895.9	23.8	7.1	2.8	0.0	14.8	38
21	15.6	906.5	23.1	7.2	3.2	0.0	14.8	47
22	15.5	917.0	24.3	6.1	2.1	0.0	14.8	39
23	16.8	928.8	25.3	6.7	2.7	0.0	14.8	35
24	17.6	941.4	25.3	7.7	3.7	0.0	14.8	42
25	19.1	955.5	25.7	10.8	6.3	0.3	15.1	39
26	16.7	967.2	20.6	15.7	14.8	2.6	17.7	84
27	16.8	979.0	21.2	11.7	8.1	3.3	21.0	76
28	15.3	989.3	18.6	15.1	14.4	4.8	25.8	85
29	14.5	998.8	20.3	9.0	4.3	0.5	26.3	54
30	11.1	1004.9	19.1	5.6	2.0	19.2	45.5	98
31	12.1	1012.0	20.9	5.4	2.7	0.3	45.8	57
Month	15.8					45.8		
Normal								
1981-2010	15.0	1118.8				80.0		

### September

Date	Temperature					Precipitation		Relative humidity at 3 p.m. %
	Effective			Surface		mm	Sum mm	
	Mean °C	temp. sum °C	Max °C	Min °C	Min °C			
1	12.5	1020	17.9	7.9	5.2	0.0	0.0	72
2	11.4	1026	14.0	7.2	4.1	5.0	5.0	77
3	11.9	1033	13.5	10.2	9.8	0.0	5.0	96
4	13.7	1042	18.8	9.1	4.6	2.4	7.4	57
5	11.8	1048	16.3	10.5	8.9	0.5	7.9	89
6	10.0	1053	15.4	4.0	2.9	6.5	14.4	83
7	10.9	1059	14.5	10.3	9.2	2.0	16.4	86
8	10.3	1065	13.9	6.4	4.9	0.0	16.4	82
9	9.3	1069	15.3	4.1	-0.6	0.0	16.4	60
10	11.2	1075	18.5	5.0	1.4	0.0	16.4	60
11	11.6	1082	19.2	3.5	-0.1	0.1	16.5	62
12	12.5	1089	18.9	6.1	2.3	0.1	16.6	62
13	11.9	1096	17.5	6.9	1.6	0.0	16.6	47
14	11.7	1103	17.6	5.3	1.2	0.1	16.7	71
15	12.6	1110	18.1	8.8	5.4	3.4	20.1	55
16	13.8	1119	15.1	12.5	12.1	2.8	22.9	95
17	14.9	1129	16.4	13.2	12.8	0.3	23.2	96
18	15.6	1140	17.4	16.4	14.9	13.3	36.5	89
19	13.2	1148	16.5	12.5	11.9	0.0	36.5	66
20	10.4	1153	16.8	6.9	2.0	0.0	36.5	61
21	9.2	1157	14.9	1.8	-1.2	3.4	39.9	74
22	11.7	1164	16.2	10.2	9.9	0.3	40.2	58
23	12.3	1171	15.2	8.8	5.4	0.0	40.2	79
24	11.9	1178	16.8	6.6	3.1	2.0	42.2	.
25	12.4	1186	16.9	10.0	6.1	1.6	43.8	71
26	9.8	1191	14.8	7.4	5.0	2.6	46.4	75
27	8.0	1194	12.5	1.7	-1.6	0.7	47.1	80
28	9.5	1198	13.3	7.5	5.7	0.0	47.1	67
29	7.9	1201	13.2	2.0	-2.6	0.0	47.1	63
30	10.4	1206	16.9	7.1	2.1	0.3	47.4	55
Month	11.5					47.4		
Normal								
1981-2010	9.9	1269				58.0		





# YLISTARO

**WEATHER CONDITIONS IN YLISTARO 2015. DATA FROM THE WEATHER STATION IN YLISTARO, PELMA**  
 (location 62.93°N, 22.48°E according to map datum WGS 84, altitude 26 m). *Data source: Finnish Meteorological Institute.*

April								
Date	Temperature					Precipitation		Relative humidity
	Mean °C	Effective		Surface Min °C	Sum mm	Mean %		
		temp. sum °C	Max °C				Min °C	
1	1.9	0.0	6.8	-0.3	-0.9	0.0	0.0	86
2	1.0	0.0	6.1	-2.2	-4.3	0.0	0.0	74
3	-0.3	0.0	1.9	-1.7	-1.5	0.0	0.0	93
4	1.9	0.0	6.2	-1.2	-3.0	0.0	0.0	93
5	2.1	0.0	6.8	-0.5	-2.7	0.0	0.0	71
6	1.4	0.0	4.2	-2.7	-5.2	2.3	2.3	84
7	5.9	0.9	11.3	2.1	1.3	0.0	2.3	74
8	5.1	1.0	8.3	2.7	1.9	0.0	2.3	71
9	5.7	1.7	9.7	2.1	0.5	0.0	2.3	51
10	5.1	1.8	9.9	1.1	0.3	0.0	2.3	62
11	6.4	3.2	12.7	-0.5	-4.0	0.0	2.3	58
12	6.3	4.5	15.4	1.8	0.8	1.5	3.8	92
13	2.8	4.5	6.4	1.5	2.0	22.8	26.6	97
14	1.0	4.5	2.5	0.1	0.0	0.4	27.0	97
15	1.6	4.5	5.1	-0.7	-1.5	1.1	28.1	83
16	1.8	4.5	4.3	-0.4	-0.5	1.4	29.5	83
17	3.5	4.5	7.9	1.0	-0.1	0.0	29.5	72
18	3.9	4.5	9.0	-1.7	-4.3	0.0	29.5	71
19	6.2	5.7	11.9	0.7	-1.5	0.0	29.5	51
20	5.7	6.4	9.2	0.7	-1.4	0.0	29.5	60
21	6.6	8.0	13.2	-0.2	-2.6	0.0	29.5	59
22	6.2	9.2	10.9	2.4	0.9	9.4	38.9	56
23	4.4	9.2	9.5	1.9	1.7	1.3	40.2	68
24	4.4	9.2	9.5	0.7	-0.1	0.0	40.2	71
25	4.7	9.2	10.8	-2.3	-6.3	1.1	41.3	49
26	5.0	9.2	8.5	4.2	3.8	5.6	46.9	99
27	6.8	11.0	12.1	3.3	3.5	0.0	46.9	70
28	5.2	11.2	11.8	-0.4	-3.4	0.0	46.9	56
29	4.2	11.2	8.9	-1.2	-4.4	0.1	47.0	84
30	5.7	11.9	11.3	-0.2	-3.9	0.0	47.0	54
Month	4.1					47.0		
<i>Normal</i> <i>1981-2010</i>	3.0					28		

May								
Date	Temperature					Precipitation		Relative humidity
	Mean °C	Effective		Surface Min °C	Sum mm	Mean %		
		temp. sum °C	Max °C				Min °C	
1	9.3	16.2	14.1	5.4	4.8	0.8	0.8	80
2	7.2	18.4	12.9	2.8	-0.6	0.0	0.8	81
3	5.6	19.0	11.2	1.3	-1.7	0.0	0.8	53
4	6.8	20.8	11.9	-1.4	-5.8	0.0	0.8	52
5	10.2	26.0	15.7	4.2	0.9	0.0	0.8	50
6	11.6	32.6	16.2	7.3	4.8	5.7	6.5	94
7	12.0	39.6	17.7	8.1	7.7	3.7	10.2	89
8	9.2	43.8	12.3	6.8	4.0	0.7	10.9	91
9	7.1	45.9	10.8	3.7	3.3	0.0	10.9	70
10	7.3	48.2	13.6	1.1	-3.3	7.2	18.1	97
11	8.8	52.0	13.0	4.5	4.3	0.2	18.3	56
12	10.6	57.6	13.4	7.4	6.7	6.6	24.9	69
13	8.0	60.6	12.5	6.5	7.7	17.4	42.3	99
14	6.2	61.8	9.2	4.6	4.5	0.8	43.1	75
15	5.1	61.9	7.9	2.3	0.1	0.0	43.1	80
16	5.8	62.7	7.8	4.4	3.9	0.0	43.1	61
17	6.6	64.3	11.8	0.8	-1.6	1.8	44.9	74
18	6.9	66.2	13.8	0.2	-2.8	6.4	51.3	58
19	6.6	67.8	10.9	4.3	4.3	6.4	57.7	61
20	8.2	71.0	12.0	4.9	1.9	0.0	57.7	68
21	10.8	76.8	16.3	5.4	4.5	0.0	57.7	57
22	11.3	83.1	16.6	2.4	-0.8	3.3	61.0	59
23	7.8	85.9	12.1	5.2	8.5	2.9	63.9	70
24	7.9	88.8	12.9	2.9	1.8	0.8	64.7	54
25	8.6	92.4	12.8	3.3	0.7	2.4	67.1	81
26	10.7	98.1	14.3	8.3	7.0	10.6	77.7	98
27	10.6	103.7	13.7	9.5	9.3	0.0	77.7	74
28	10.4	109.1	15.3	4.3	0.6	0.0	77.7	40
29	9.5	113.6	13.6	4.3	1.5	6.3	84.0	64
30	12.3	120.9	17.9	6.2	5.3	2.3	86.3	42
31	11.8	127.7	16.1	7.9	7.5	1.0	87.3	50
Month	8.7					87.3		
<i>Normal</i> <i>1981-2010</i>	9.1					43		

# YLISTARO

**WEATHER CONDITIONS IN YLISTARO 2015. DATA FROM THE WEATHER STATION IN YLISTARO, PELMA**  
**(location 62.93°N, 22.48°E according to map datum WGS 84, altitude 26 m). Data source: Finnish Meteorological Institute.**

June								
Date	Temperature					Precipitation		Relative humidity
	Mean °C	Effective temp. sum °C	Max °C	Min °C	Surface Min °C	Sum mm	Sum mm	Mean %
2	10.9	139.9	15.5	7.1	5.7	7.0	8.8	76
3	10.2	145.1	13.9	7.7	6.1	0.0	8.8	71
4	10.4	150.5	14.5	6.7	5.0	0.0	8.8	48
5	10.8	156.3	15.2	4.6	0.7	0.0	8.8	51
6	10.9	162.2	17.4	4.6	1.4	3.5	12.3	88
7	11.5	168.7	15.4	9.1	8.7	0.0	12.3	63
8	9.7	173.4	13.7	5.5	2.7	0.0	12.3	57
9	11.0	179.4	14.9	7.0	5.1	0.0	12.3	54
10	11.3	185.7	15.7	6.0	4.8	0.2	12.5	72
11	11.1	191.8	15.7	5.5	0.7	0.0	12.5	51
12	13.4	200.2	17.8	6.8	4.8	0.0	12.5	51
13	12.4	207.6	16.6	9.0	7.1	0.0	12.5	39
14	9.8	212.4	15.4	4.6	1.5	3.9	16.4	98
15	10.2	217.6	14.3	7.1	6.8	0.6	17.0	59
16	10.5	223.1	15.4	6.0	3.4	0.6	17.6	46
17	10.8	228.9	15.5	5.6	2.8	0.0	17.6	46
18	11.0	234.9	16.7	2.4	-2.2	9.8	27.4	80
19	12.4	242.3	16.7	8.9	6.9	0.2	27.6	81
20	15.1	252.4	21.3	12.0	11.5	6.7	34.3	87
21	14.6	262.0	18.0	13.0	12.9	1.8	36.1	88
22	14.1	271.1	17.6	12.0	8.9	4.4	40.5	97
23	14.0	280.1	19.4	8.9	7.0	2.2	42.7	58
24	13.2	288.3	17.8	11.9	10.4	24.4	67.1	98
25	13.9	297.2	18.2	11.3	10.9	0.0	67.1	67
26	14.0	306.2	18.7	9.5	8.3	0.0	67.1	68
27	12.1	313.3	16.5	7.5	4.3	0.0	67.1	81
28	15.3	323.6	21.0	6.1	2.0	0.0	67.1	63
29	17.1	335.7	22.4	9.2	4.0	0.3	67.4	71
30	14.2	344.9	17.0	13.4	13.0	0.8	68.2	83
Month	12.2					68.2		
Normal 1981-2010	13.8					55		

July								
Date	Temperature					Precipitation		Relative humidity
	Mean °C	Effective temp. sum °C	Max °C	Min °C	Surface Min °C	Sum mm	Sum mm	Mean %
2	19.4	369.3	26.6	9.6	5.5	0.0	0.0	51
3	22.3	386.6	26.8	16.0	12.5	0.0	0.0	38
4	17.7	399.3	22.4	13.9	10.6	0.0	0.0	67
5	14.6	408.9	18.3	11.0	8.6	0.0	0.0	45
6	15.2	419.1	21.7	3.1	0.1	6.2	6.2	46
7	13.8	427.9	17.6	10.3	10.3	0.2	6.4	85
8	15.0	437.9	20.5	10.5	8.1	10.9	17.3	57
9	15.3	448.2	19.7	13.3	11.8	23.1	40.4	74
10	14.8	458.0	19.0	12.5	12.3	11.1	51.5	97
11	14.1	467.1	18.6	12.0	12.0	0.0	51.5	54
12	12.1	474.2	15.7	9.5	8.2	0.0	51.5	68
13	13.3	482.5	17.9	6.9	3.9	0.0	51.5	57
14	12.6	490.1	18.7	5.3	1.6	0.0	51.5	57
15	12.7	497.8	18.1	4.7	1.4	0.0	51.5	55
16	15.0	507.8	20.1	10.4	7.5	12.5	64.0	88
17	14.2	517.0	19.1	7.5	5.3	0.0	64.0	66
18	14.0	526.0	20.5	7.4	3.4	1.6	65.6	52
19	14.8	535.8	19.0	11.9	11.0	0.1	65.7	73
20	14.3	545.1	19.7	7.5	4.1	0.0	65.7	44
21	15.0	555.1	20.3	8.3	3.9	1.0	66.7	44
22	14.5	564.6	17.0	12.2	11.7	4.5	71.2	.
23	14.3	573.9	17.4	11.4	9.4	24.6	95.8	77
24	14.1	583.0	17.8	12.3	12.1	4.3	100.1	90
25	15.9	593.9	21.2	10.2	7.1	1.5	101.6	47
26	14.1	603.0	15.5	12.6	11.8	8.9	110.5	95
27	15.1	613.1	16.5	14.2	12.8	1.8	112.3	89
28	15.9	624.0	21.0	10.3	8.1	0.0	112.3	51
29	14.9	633.9	18.4	11.7	8.4	0.6	112.9	77
30	14.9	643.8	19.6	10.7	8.0	0.1	113.0	61
31	13.7	652.5	19.9	8.4	6.7	0.0	113.0	71
Month	14.9					113.0		
Normal 1981-2010	16.3					75		

# YLISTARO

**WEATHER CONDITIONS IN YLISTARO 2015. DATA FROM THE WEATHER STATION IN YLISTARO, PELMA**  
 (location 62.93°N, 22.48°E according to map datum WGS 84, altitude 26 m). *Data source: Finnish Meteorological Institute.*

## August

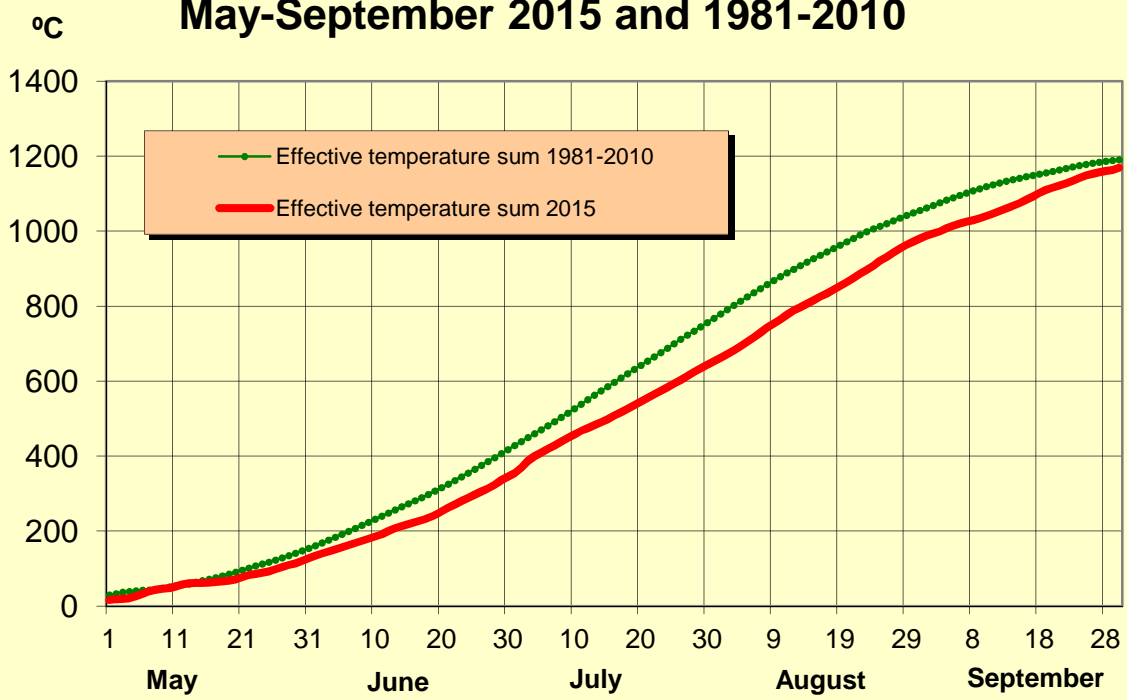
Date	Temperature					Precipitation		Relative humidity
	Mean °C	Effective temp. sum °C	Max °C	Min °C	Surface Min °C	mm	Sum mm	Mean %
1	14.6	662.1	20.0	8.5	5.0	0.0	0.0	71
2	15.0	672.1	20.8	10.2	6.7	0.0	0.0	40
3	14.3	681.4	19.4	8.7	3.9	0.0	0.0	74
4	16.0	692.4	21.7	9.9	5.4	0.0	0.0	46
5	16.8	704.2	23.7	7.2	3.5	0.9	0.9	47
6	16.9	716.1	19.5	14.1	13.2	0.0	0.9	75
7	18.3	729.4	23.5	11.9	7.4	0.0	0.9	50
8	17.8	742.2	23.0	14.5	12.3	30.0	30.9	75
9	15.9	753.1	21.2	11.5	7.8	0.0	30.9	56
10	16.5	764.6	23.7	7.3	4.4	0.0	30.9	38
11	17.6	777.2	22.8	12.1	7.6	3.5	34.4	57
12	15.8	788.0	20.2	13.0	10.9	0.9	35.3	78
13	13.7	796.7	18.0	9.0	5.9	0.0	35.3	51
14	14.4	806.1	20.1	8.5	4.4	0.0	35.3	50
15	14.3	815.4	20.2	6.3	2.9	0.0	35.3	51
16	14.1	824.5	21.6	5.7	1.8	0.0	35.3	35
17	14.2	833.7	23.7	3.6	-0.4	0.0	35.3	30
18	15.1	843.8	25.2	3.5	0.3	0.0	35.3	32
19	.	853.8	.	5.0	2.0	0.0	35.3	.
20	14.8	863.6	23.3	5.0	.	0.0	35.3	47
21	16.2	874.8	23.5	8.9	3.6	0.0	35.3	41
22	16.6	886.4	25.1	8.5	3.9	0.0	35.3	43
23	14.8	896.2	24.9	5.6	0.9	0.0	35.3	39
24	16.7	907.9	26.9	6.0	2.9	0.0	35.3	38
25	17.5	920.4	25.4	9.2	4.9	0.0	35.3	41
26	15.7	931.1	19.1	12.2	7.3	0.4	35.7	85
27	16.2	942.3	19.0	13.3	10.9	2.2	37.9	91
28	16.2	953.5	20.7	15.4	14.8	1.8	39.7	64
29	14.5	963.0	19.8	11.3	9.9	0.0	39.7	53
30	13.8	971.8	20.9	7.2	2.4	19.6	59.3	49
31	13.8	980.6	20.9	6.2	3.9	0.0	59.3	44
Month	15.6					59.3		
Normal 1981-2010	14.3					67		

## September

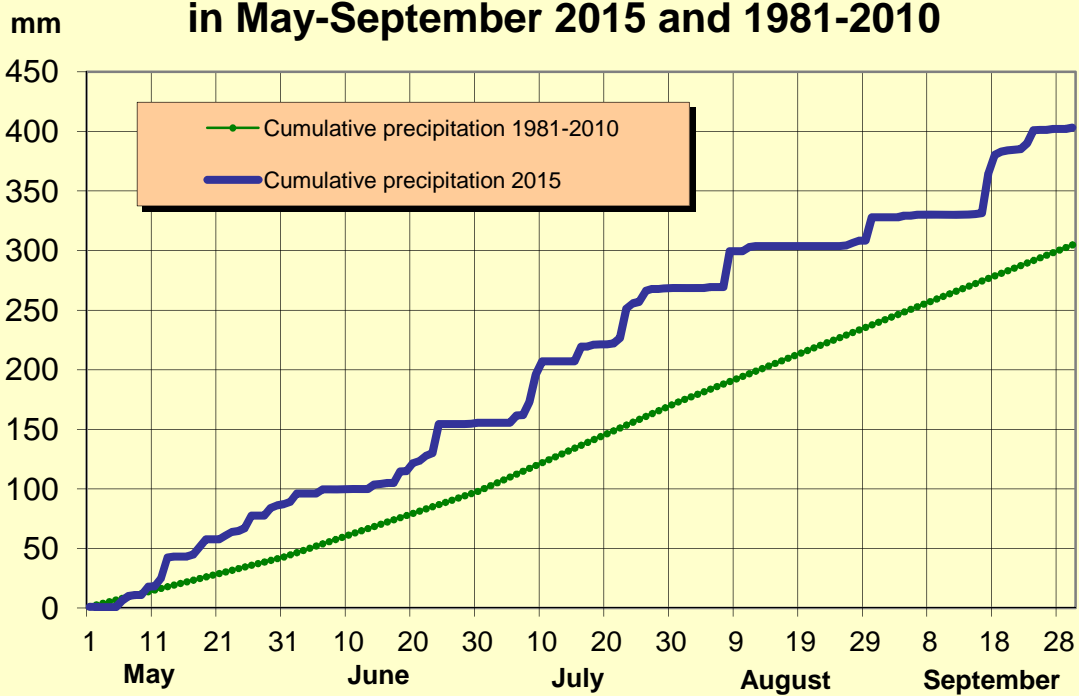
Date	Temperature					Precipitation		Relative humidity
	Mean °C	Effective temp. sum °C	Max °C	Min °C	Surface Min °C	mm	Sum mm	Mean %
1	12.2	987.8	19.2	7.2	3.5	0.0	0.0	65
2	10.1	992.9	14.5	3.9	0.4	0.0	0.0	54
3	11.3	999.2	18.5	6.8	5.7	0.0	0.0	51
4	13.0	1007.2	18.2	8.0	2.5	1.4	1.4	73
5	11.8	1014.0	17.4	9.3	7.2	0.0	1.4	65
6	10.2	1019.2	16.0	4.7	3.2	0.8	2.2	76
7	10.4	1024.6	15.0	9.2	5.5	0.0	2.2	67
8	9.5	1029.1	14.0	5.0	1.0	0.0	2.2	65
9	9.6	1033.7	17.3	1.9	-1.5	0.0	2.2	50
10	11.0	1039.7	20.1	3.5	0.6	0.0	2.2	55
11	11.7	1046.4	21.3	2.9	0.4	0.0	2.2	48
12	12.5	1053.9	20.3	6.4	1.0	0.1	2.3	52
13	11.5	1060.4	17.5	5.5	-0.1	0.0	2.3	46
14	11.8	1067.2	18.8	5.8	0.6	0.0	2.3	48
15	12.3	1074.5	19.4	6.6	0.3	0.4	2.7	50
16	13.7	1083.2	17.5	11.4	10.6	0.8	3.5	81
17	13.6	1091.8	14.6	10.4	5.6	33.5	37.0	92
18	15.0	1101.8	16.1	14.5	14.4	15.5	52.5	92
19	12.9	1109.7	15.4	11.4	10.4	2.6	55.1	67
20	10.9	1115.6	15.4	8.1	6.8	1.0	56.1	73
21	10.6	1121.2	14.8	6.0	1.6	0.7	56.8	82
22	10.8	1127.0	15.5	7.2	5.0	0.5	57.3	80
23	11.6	1133.6	14.6	7.1	1.9	4.9	62.2	72
24	12.9	1141.5	16.0	10.6	9.1	11.0	73.2	.
25	11.7	1148.2	14.9	11.2	10.3	0.1	73.3	92
26	9.6	1152.8	14.5	7.6	5.6	0.2	73.5	79
27	9.2	1157.0	14.0	5.3	1.7	0.7	74.2	68
28	8.5	1160.5	12.7	7.7	4.2	0.0	74.2	60
29	7.5	1163.0	14.3	-0.9	-2.7	0.1	74.3	62
30	10.8	1168.8	14.6	9.1	5.6	1.1	75.4	59
Month	11.3					75.4		
Normal 1981-2010	9.3					51		



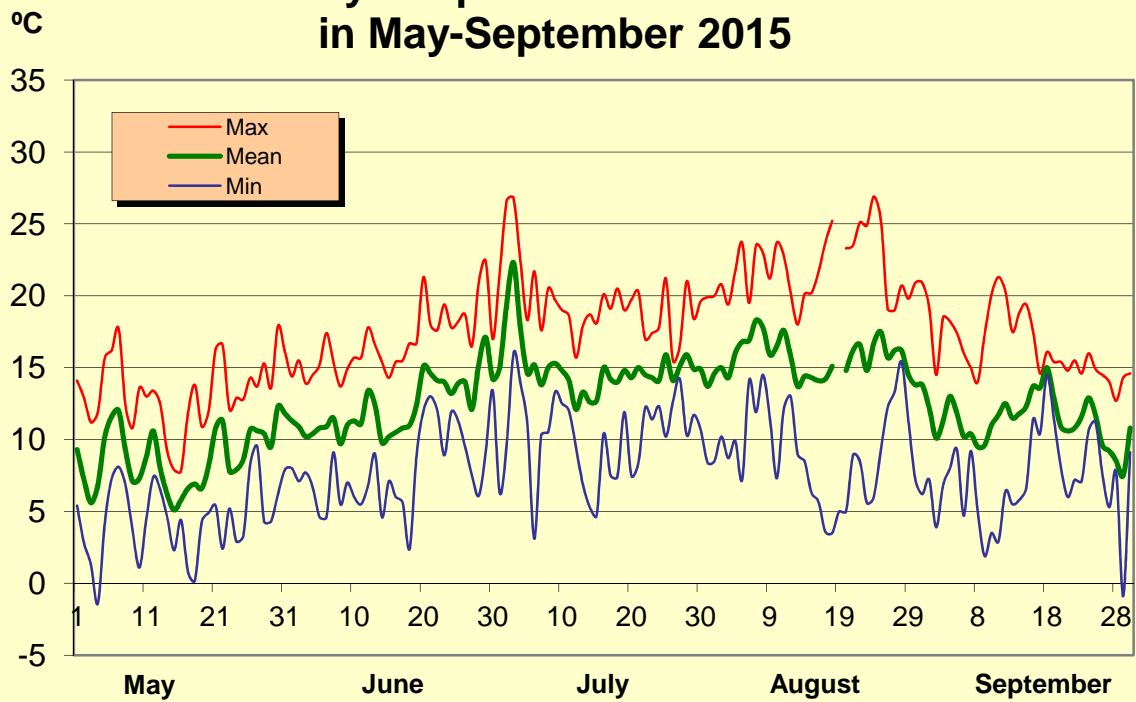
**Effective temperature sum (+5°C) in Ylistaro  
May-September 2015 and 1981-2010**



**Cumulative precipitation in Ylistaro  
in May-September 2015 and 1981-2010**



**Daily temperature in Ylistaro  
in May-September 2015**



**Daily precipitation in Ylistaro  
in May-September 2015**

