DEPARTMENT OF AGROECOLOGY
AARHUS UNIVERSITY

Final report of trials 22404, 22416 and 22478

Optimized weed control in open field vegetables and strawberries by addition of liquid nitrogen (N) fertilizer

Forstærket ukrudtsbekæmpelse i frilandsgrønsager og jordbær med flydende kvælstof gødning

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Report for Produktionsafgiftsfonden for frugt og gartneriprodukter

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CONTENT

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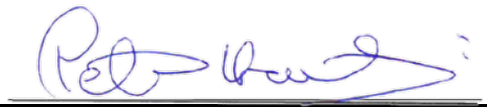
Trial leader's authentication
This report represents a true and accurate record of the results obtained.

19 January 2023 
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Abstract (English)

An addition of liquid N fertilizer to herbicide treatment is seen as a way of reducing the herbicide dose rate used to reach lower phytotoxicity damages and without negative impact on yield while maintaining or increasing weed control efficacy in open field crops as carrots, strawberries, and onions. Despite no significant results in carrot crops, it seems that an addition of liquid N fertilizer could improve the herbicide efficacy at a half dose rate while strategy I seems to be more promising than strategy II. In the case of strawberry crops the second strategy provides an improved weed control and it seems favorized by the use of Betanal product while liquid N fertilizer shows increasing effectiveness in half dose rate treatment. In onion crops, an addition of liquid N fertilizer doesn't show any interest while full and half dose rates treatments show similar efficacies in most of the assessments. But some weeds as *Viola arvensis* require full dose rate herbicide treatment. Furthermore, liquid N fertilizer doesn't significantly increase phytotoxicity.

Abstract (Danish)

Kvælstofsgødning i blandinger med de væsentligste ukrudtsmidler kan ses som en måde at nedsætte forbrug af ukrudtsmidler, samtidig med at bevare samme eller lavere afgrødeskånsomhed i gulerødder, løg og jordbær. På trods af ingen signifikante resultater i forsøget med gulerødder, ser det ud til, at en tilsætning af flydende N-gødning kunne forbedre herbicideffekt af den reducerede dosis af herbicidstrategi, samtidig med at strategi I ser ud til at være mere lovende end strategi II. I forsøget med jordbær giver ukrudtsstrategi II med bl.a. Betanal forbedret ukrudtsbekæmpelse i forholdt til strategi I. I forsøget med jordbær var der en tydelig og ofte signifikant tendens til, at tilsætning af flydende N kunne bidrage til øget effekt af den reducerede dosis af ukrudtsmidler. I løg viser tilsætning af flydende N-gødning ingen forskel, mens behandlinger med fuld og halv dosis viser lignende effektivitet i de fleste sammenligninger. Men noget ukrudt som ager stedmoder (*Viola arvensis*) kræver behandling med fuld dosis for at opnå en tilstrækkelig effekt. Ydermere øger flydende N-gødning ikke fytotoksiciteten væsentligt.

Introduction

The objectives of these trials are to test and demonstrate, whether it is possible or not to reduce the use of herbicide by boosting herbicide efficacy by adding liquid nitrogen fertilizer to a tank mix. These three field trials are continuation of the teamwork with liquid nitrogen fertilizer trials, carried out in 2020 and 2021. Several trials in semi-field with different vegetable crops, and different weeds to gather some efficacy and selectivity data were carried out.

Since the beginning of the utilization of herbicide products farmers are challenged by the development that more and more herbicides for minor crop production are being banned, the approved doses are being reduced and weed resistances soar. These trials have been intended to test how growers could improve the way of using these products when the approved dose rate is not sufficient or when they should reduce the use of pesticides according to EU strategy for sustainable use of pesticide until 2030 to reduce their use by 50% or other national guidelines.

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Materials and methods

Valid for all three trials

The total amount of N-fertilizer (120 kg N/ha) in the trial was adjusted by lowering the input of granulated N fertilizer for treatments 4 and 7, respectively. It was compensated by the addition of liquid fertilizer (added in a tank mix) at some application timings. All treatments received equal input of total N fertilizer. This goes for all three trials.

During this trial 2 different herbicides strategies were studied. Strategy I concerns treatments 2,3 and 4 while strategy II concerns treatments 5,6 and 7.
Treatments 2 and 5 are 100% herbicide dose rate treatment while 3, 4, 6 and 7 are 50% dose rate herbicide treatment which receive an addition of liquid fertilizer (4 and 7) in order to boost the efficacy of the herbicide to enhance weed control while reducing damage (phytotoxicity) on the crops.

DFF SC 500 and **Fenix** products were used in the form of suspension concentrate, **Goltix WG** as water dispersible granules, **Centium** as capsule suspension and **liquid N fertilizer** as flowable. **Stomp CS** was used as a capsule suspension for dilution with water, **Boxer** was used as an emulsifiable concentrate for dilution in water and **Betanal** as a suspension concentrate. **Lentegran 45** as wettable powder.

Carrots

The first part measuring 3,5 m is treated with steam to avoid weeds emerging from the soil weed seed bank, and this area is then dedicated for assessment for damage and yield. The other half is used to record the effects on weeds and both parts are sprayed and fertilized equally. A plot area is 2,5 m width and 7 m length for a total area of 17,5 m². Each treatment is replicated 4 times for a total of 28 plots. Treatments B was realized on the 07/06/2022, C on 17/06/2022, D on the 24/06/2022 and E on the 04/07/2022.
The type of nozzle used is a Hardi LD015-110 at 3,8 bars with an interspace of 50 cm length. Boom length is 2.5m for 5 nozzles/row. Products were mixed with water for a total rate of 200 L/ha and sprayed at a speed of 3.6 KPH at height of 50cm.
Herbicide products dose rates are in L/ha.
Application A was realized at the beginning of the trial before sowing.
Application B was realized on a moist soil just before germination. It consists of a spray of *DFF* (treatments 2 : 0.15L/ha, 3 : 0.075 L/ha, 4 : 0.075 L/ha), *Goltix WG* (treatments 5 : 1.0 L/ha, 6 : 0.5 L/ha, 7 : 0.5 L/ha) at different dose rates and a spray of *liquid fertilizer* : 40 kg N/ha L/ha for treatments 4 and 7.
Application C consists of a spray of *Fenix* at a dose rate of 0.3 L/ha for treatments 2 and 5 while 3, 4, 6 and 7 are sprayed with half the dose rate (i.e 0.15 L/ha).
Application D consists of a spray of *Fenix* (treatments 2 : 0.5 L/ha, 3 : 0.25 L/ha, 4 : 0.25 L/ha, 5 : 0.3 L/ha, 6 : 0.15 L/ha and 7 : 0.15 L/ha), *Centium CS* (treatments 5 : 0.08 L/ha, 6 : 0.04 L/ha and 7 : 0.04 L/ha) and *liquid fertilizer* (treatments 4 : 10 kg N/ha and 7 : 10 kg N/ha).
Application E consists of a spray of *Fenix* (treatments 2 : 0.5 L/ha, 3 : 0.25 L/ha, 4 : 0.25 L/ha, 5 : 0.3 L/ha, 6 : 0.15 L/ha and 7 : 0.15 L/ha), *Centium CS* (treatments 5 : 0.08 L/ha, 6 : 0.04 L/ha and 7 : 0.04 L/ha) and *liquid fertilizer* (treatments 4 : 10 kg N/ha and 7 :10 kg N/ha).

About data assessments, effect on weeds were assessed at treatments D, E, and 2 weeks after treatment E. Damage assessments at C, D, E, and 2 weeks after E. The harvest of carrots was cancelled in this trial because of the poor establishment of the carrots – they emerged very uneven, and it was decided not to harvest this trial.

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		A		B		C		D		E		
	Granuleret gødskning før såning kilo N/ha			På fugtig jord lige før fremspiring (evt. vandet)				8-12 dage efter C		8-12 dage efter D		Granuleret sengødskning - placeres mellem tid C, D, E eller efter. Kilo N/ha
BBCH						BBCH 10,5 -11						
1.	60	Ubehandlet										60
2.	60			DFF	0,15	Fenix	0,3	Fenix	0,5	Fenix	0,5	60
3.	60			DFF	0,075	Fenix	0,15	Fenix	0,25	Fenix	0,25	60
4.	60			DFF + Fl. N	0,075 + 40 N	Fenix	0,15	Fenix + Fl. N	0,25 + 10 N	Fenix + Fl. N	0,25 + 10 N	0
5.	60			Goltix WG	1,0	Fenix	0,3	Fenix + Centium CS	0,3 + 0,08	Fenix + Centium CS	0,3 + 0,08	60
6.	60			Goltix WG	0,5	Fenix	0,15	Fenix + Centium CS	0,15 + 0,04	Fenix + Centium CS	0,15 + 0,04	60
7.	60			Goltix WG + Fl. N	0,5 + 40 kg N	Fenix	0,15	Fenix + Centium CS + Fl. N	0,15 + 0,04 + 10 kg N	Fenix + Centium CS + Fl. N	0,15 + 0,04 + 10 kg N	0

Fig 1: Trial plan of liquid nitrogen fertilizer trial in carrots

Strawberries

Plot area is 2 m width and 5 m length for a total treated area of 10 m². There are 4 replicates for a total of 28 plots. The trial contains 3 treatments timings with 2 different treatment strategies. Strategy I includes treatments 2, 3 and 4 and strategy II includes treatments 5, 6 and 7 while treatment 1 is the untreated control (but fertilized). Treatment A was realized on the 10/06/2022, B on 23/06/2022, C on the 08/07/2022. Herbicide products dose rates are in L/ha.
Application A was realized on moist soil on newly sprouted weeds. It consists of a spray of Stomp CS (treatments 2 : 1.6 L/ha, 3 : 0.8 L/ha, 4 : 0.8 L/ha), Boxer (treatments 2 : 1.5 L/ha, 3 : 0.75 L/ha, 4 : 0.75 L/ha, Goltix WG (treatments 5 : 1.0 L/ha, 6 : 0.5 L/ha, 7 : 0.5 L/ha) and an addition of liquid fertilizer for treatments 4 and 7 with 40 kg N/ha.
Application B was realized after emergence of newly sprouted weeds 13 days after treatment A. It consists of a spray of Boxer (treatments 2 : 1.5 L/ha, 3 : 0.75), 4 : 0.75 L/ha, 5 : 2.0 L/ha, 6 : 1.0 L/ha, 7 : 1.0 L/ha), Goltix WG (treatments 2 : 0.75 L/ha, 3 : 0.35 L/ha, 4 : 0.35 L/ha), Betanal (treatments 5 : 2.0 L/ha, 6 : 1.0 L/ha, 7 : 1.0 L/ha) and an addition of liquid fertilizer for treatments 4 and 7 with 20 kg N/ha.
Application C was realized after emergence of newly sprouted weeds 16 days after treatment B. It consists of a spray of Boxer (treatments 2 : 1.5 L/ha, 3 : 0.75), 4 : 0.75 L/ha, 5 : 2.0 L/ha, 6 : 1.0 L/ha, 7 : 1.0 L/ha), Goltix WG (treatments 2 : 0.75 L/ha, 3 : 0.35 L/ha, 4 : 0.35 L/ha), Betanal (treatments 5 : 2.0 L/ha, 6 : 1.0 L/ha, 7 : 1.0 L/ha) and an addition of liquid fertilizer for treatments 4 and 7 with 20 kg N/ha.

The spraying was realized with a manual bicycle sprayer using Hardi nozzles LD015-110 with a pressure of 1.9 bar, with a nozzle spacing of 50 cm and a boom of 1.5 m long (3 nozzles) at 50 cm above the treatment area (soil). Strawberry density was 4.5 plants/m².

	A					B		C	
	Granuleret gødskning før såning kilo N/ha			On moist soil on newly emerged weeds		For new weeds (12-14 days after A)		For new weeds (12-14 days after B)	
BBCH									
1.	80	Ubehandlet							
2.	80			Stomp CS + Boxer	1,6 + 1,5	Boxer + Goltix WG	1,5 + 0,7	Boxer + Goltix WG	1,5 + 0,7
3.	80			Stomp CS + Boxer	0,8 + 0,75	Boxer + Goltix WG	0,75 + 0,35	Boxer + Goltix WG	0,75 + 0,35
4.	0			Stomp CS + Boxer + Fl. N	0,8 + 0,75 + 40 N	Boxer + Goltix WG + Fl. N	0,75 + 0,35 + 20 N	Boxer + Goltix WG + Fl. N	0,75 + 0,35 + 20 N
5.	80			Goltix WG	1,0	Betanal + Boxer	2,0 + 2,0	Betanal + Boxer	2,0 + 2,0
6.	80			Goltix WG	0,5	Betanal + Boxer	1,0 + 1,0	Betanal + Boxer	1,0 + 1,0
7.	0			Goltix WG + Fl. N	0,5 + 40 N	Betanal + Boxer + Fl. N	1,0 + 1,0 + 20 N	Betanal + Boxer + Fl. N	1,0 + 1,0 + 20 N

Fig 2: Trial plan of liquid nitrogen fertilizer in strawberry crop

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Onions

The first part measuring 3,5 m is treated with steam to avoid weeds emerging from the soil weed bank, and this area is then dedicated for assessment for damage and yield. The other half is used to record the effects on weeds and both parts are sprayed and fertilized equally. Plot area is 2,5 m width and 7 m length for a total treated area of 17,5 m². There are 4 replicates for a total of 28 plots. The trial contains 9 application timings for strategy I and 6 for strategy II. Strategy I includes treatments 2, 3 and 4 and strategy II includes treatments 5, 6 and 7. Treatment 1 is untreated control but is fertilized. Application B was realized on the 05/05/2022, C on 10/05/2022, D on the 18/05/2022, E on the 23/05/2022, F on the 30/05/2022, G on the 08/06/2022, and H on the 17/06/2022. Herbicide products dose rates are in L/ha.

Application A consists of a spread of granulated fertilizer with 60 kg N/ha for each treatment.

Application B (soil at 14°C, air at 13°C and 49 % relative humidity rH) was realized before germination on a moist soil. It consists of a spray of Stomp CS (treatments 2 : 1.6 L/ha, 3 : 0.8), 4 : 0.8 L/ha), Goltix WG (treatments 5 : 1 L/ha, 6 : 0.5 L/ha, 7 : 0.5 L/ha), Fenix (treatments 2 : 0.4 L/ha, 3 : 0.2 L/ha, 4 : 0.2 L/ha) and an addition of liquid fertilizer for treatments 4 and 7 with 27 kg N/ha.

Application C (soil at 17.5°C, air at 20.5°C and 43.8 % rH) was realized between 5 and 7 days after treatment B. It consists of a spray of Fenix (treatments 2 : 0.5 L/ha), Boxer (treatments 3 : 0.25 L/ha, 4 : 0.25 L/ha, 5 : 0.5 L/ha, 6 : 0.25 L/ha, 7 : 0.25 L/ha)

Application D (soil at 15.7°C, air at 16.8°C and 46.3 % rH) was realized between 4 and 5 days after treatment C. It consists of a spray of Boxer (treatments 2 : 0.5 L/ha, 3 : 0.25 L/ha, 4 : 0.25 L/ha, 5 : 0.5 L/ha, 6 : 0.25 L/ha, 7 : 0.25 L/ha), Fenix (treatments 2 : 0.1 L/ha, 3 : 0.05 L/ha, 4 : 0.05 L/ha, 5 : 0.1 L/ha, 6 : 0.05 L/ha, 7 : 0.05 L/ha) and an addition of liquid fertilizer for treatments 4 and 7 with 20 kg N/ha.

Application E was realized between 4 and 5 days after treatment D. It consists of a spray of Boxer (treatments 2 : 0.5 L/ha, 3 : 0.25 L/ha, 4 : 0.25 L/ha, 5 : 0.5 L/ha, 6 : 0.25 L/ha, 7 : 0.25 L/ha)

Application F (soil at 14.5°C, air at 15°C and 66.5 % rH) was realized between 5 and 6 days after treatment E. It consists of a spray of Boxer (treatments 2 : 0.5 L/ha, 3 : 0.25 L/ha, 4 : 0.25 L/ha, 5 : 0.5 L/ha, 6 : 0.25 L/ha, 7 : 0.25 L/ha), Fenix (treatments 2 : 0.2 L/ha, 3 : 0.1 L/ha, 4 : 0.1 L/ha, 5 : 0.2 L/ha, 6 : 0.1 L/ha, 7 : 0.1 L/ha) and an addition of liquid fertilizer for treatments 4 and 7 with 20 kg N/ha.

Application G (soil at 17.1°C, air at 16.9°C and 65 % rH) was realized 7 days after treatment F. It consists of a spray of Boxer (treatments 2 : 0.5 L/ha, 3 : 0.25 L/ha, 4 : 0.25 L/ha) and Lentagran (treatments 2 : 0.2 L/ha, 3 : 0.1 L/ha, 4 : 0.1 L/ha).

Application H (soil at 15°C, air at 15°C and 65 % rH) was realized 10 days after treatment G. It consists of a spray of Fenix (treatments 2 : 0.3 L/ha, 3 : 0.15 L/ha, 4 : 0.15 L/ha) and Lentagran (treatments 2 : 0.5 L/ha, 3 : 0.25 L/ha, 4 : 0.25 L/ha).

Application I was realized between 10 and 12 days after treatment H. It consists of a spray of Lentagran (treatments 2 : 1.0 L/ha, 3 : 0.5 L/ha, 4 : 0.5 L/ha).

The last 67 kg N/ha where spread between treatment G and I. The sprayings were carried out with a speedy 2500 Alu self-driven sprayer, using Hardi nozzles LD015-110 with a pressure of 3.8 bars, with a nozzle spacing of 50 cm with a boom of 1.5 m long (3 nozzles per row in treatment A and 5 for the others) at 50 cm above the treatment area. Mix size was 4 L and spray volume equaled to 200 L/ha. The self-driven sprayer drove at 3.6 kph.

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		A		B		C		D		E		F		G		H		I		
	Granuleret gødskning før såning kilo N/ha			På fugtig jord lige før fremspiring (evt. vandet)		5-7 dage efter B		4-5 dage efter C		4-5 dage efter D		5-6 dage efter E		7 dage efter F		10 dage efter G		10-12 dage efter H		Granuleret sengødskning - placeres mellem tid G, H, I eller efter. Kilo N/ha
BBCH						10		11		11		11		11-12		12		13		
1.	60	Ubehandlet																		67
2.	60			Stomp CS + Fenix	1,6 + 0,4	Fenix	0,5	Boxer + Fenix	0,5 + 0,1	Boxer	0,5	Boxer + Fenix	0,5 + 0,2	Boxer + Lentagran	0,5 + 0,2	Fenix + Lentagran	0,3 + 0,5	Lentagran	1,0	67
3.	60			Stomp CS + Fenix	0,8 + 0,2	Boxer	0,25	Boxer + Fenix	0,25 + 0,05	Boxer	0,25	Boxer + Fenix	0,25 + 0,1	Boxer + Lentagran	0,25 + 0,1	Fenix + Lentagran	0,15 + 0,25	Lentagran	0,5	67
4.	60			Stomp CS + Fenix + Fl. N	0,8 + 0,2 + 27 kg N	Boxer	0,25	Boxer + Fenix + Fl. N	0,25 + 0,05 + 20 kg N	Boxer	0,25	Boxer + Fenix + Fl. N	0,25 + 0,1 + 20 kg N	Boxer + Lentagran	0,25 + 0,1	Fenix + Lentagran	0,15 + 0,25	Lentagran	0,5	
5.	60			Goltix WG	1,0	Boxer	0,5	Boxer + Fenix	0,5 + 0,1	Boxer	0,5	Boxer + Fenix	0,5 + 0,2							67
6.	60			Goltix WG	0,5	Boxer	0,25	Boxer + Fenix	0,25 + 0,05	Boxer	0,25	Boxer + Fenix	0,25 + 0,1							67
7.	60			Goltix WG + Fl. N	0,5 + 27 kg N	Boxer	0,25	Boxer + Fenix + Fl. N	0,25 + 0,05 + 20 kg N	Boxer	0,25	Boxer + Fenix + Fl. N	0,25 + 0,1 + 20 kg N							

Fig 3: Trial plan of liquid nitrogen fertilizer in onion crop. The yellow cell at application C/treatment 2 corre-

Results:

Carrots

On the first assessment of the **24/06/2022** (treatment D), a significant decrease of **plant phytotoxicity** is showed from treatments 2 to 4. In treatment 4, addition of liquid fertilizer allows a significant reduction of phytotoxicity from 18,8 in treatment 2 and 12,5 in treatment 3 to 6,3 in treatment 4. Thus, a decrease of phytotoxicity around 2 times lower between treatments 3 and 4.
In treatments 5, 6 and 7 a significant reduction compared to control is observed but no significant difference was showed between treatments without liquid fertilizer and the treatment within. But a tendency of reduction of phytotoxicity is observed while reducing the dose rate.

Concerning the effect on ***Viola arvensis*** (Field pansy), reduction of dose rate or addition of liquid fertilizer in treatments 2,3 and 4 don't significantly change weed control which is 100% in every treatment. In treatments 5,6 and 7, the reduction of the dose rate is significantly compensated by the addition of liquid fertilizer, and it seems there is a tendency to a higher weed control with half dose + liquid N fertilizer than full dose of product only.

Concerning the effect on ***Chenopodium album*** (Common lambsquarters), in strategy I it seems that despite a reduction of dose rate by half, there is a tendency to compensate it while using liquid nitrogen fertilizer. Concerning strategy II, the same tendency is showed. Still, it seems that nitrogen liquid fertilizer doesn't permit to retrieve the same level of efficacy as a full dose rate herbicide treatment.

Concerning the effect on **other broad-leaved plants** in strategy I, it seems that there is no tendency to compensate the reduction of the dose rate even with an addition of liquid fertilizer. Values of treatment 3 (83.8%) and treatment 4 (82.5%) are very similar but still inferior of the full dose treatment 2 (94.3%). In strategy II, there is a significant difference of effect between treatment 5 (72,5%) which is full dose and treatment 6 (50%) which is half dose without addition of liquid fertilizer. But there is no significant difference between treatment 5 and treatment 7 (60%) and 6 and 7, it means that the addition of liquid fertilizer seems to have compensated the effect caused by the reduction of dose rate compared to treatment 5.

On the second assessment of the **04/07/2022**, in strategy I a significant decrease in phytotoxicity effect is observed between treatments 2 and 3. No significant difference are showed between treatments 3 and 4, that means liquid fertilizer addition doesn't significantly damage carrot plants. In strategy II, there is a significant difference between treatments 4 and 5 while there is no difference between treatments 6 and 7 and 5 and 7, it means that the addition of liquid fertilizer doesn't damage more the carrot plants than without.

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Concerning the effect on ***Viola arvensis*** (Field pansy), reduction of dose rate or addition of liquid fertilizer in treatments 2,3 and 4 don't significantly change weed control which is 100% in every treatment. In treatments 5,6 and 7, the reduction of the dose rate is significantly compensated by the addition of liquid fertilizer, and it seems there is a tendency to an equal weed control with half dose + liquid fertilizer than full dose of product only.

Concerning the effect on ***Chenopodium album*** (Common lambsquarters). In strategy I, an addition of liquid fertilizer at a half dose rate doesn't show any difference with treatment 2 but there is a tendency to have a lower effect on weed control despite this addition. And it seems that treatments 3 and 4 are similar compared to treatment 2. In strategy II, there is a significant difference between treatments 5 and 6 meaning that the reduction of dose rate reduces weed control but there is a difference between treatments 6 and 7 and no difference between 5 and 7. Additional liquid fertilizer at half dose rate compensates the reduction of product amount and ensure an efficient weed control.

Concerning **other broad-leaved plants**, in strategy I, there isn't any difference between the three treatments (2,3 and 4) even if it seems that 3 and 4 show a lower weed control effect than treatment 2. Addition of liquid fertilizer and reduction of dose rate don't seem to affect the efficacy of the product. In strategy II, there is a significant difference between treatment 5 and 6 where treatment 6's value is lower than treatment 5's but it seems that there is a tendency to increase the effect of the treatment after an addition of liquid fertilizer even at a half dose rate. And there isn't any significant difference between treatments 5 and 7 but it seems that treatment 7's value is lower than treatment 5's value even with an addition of liquid fertilizer.

To conclude about strategy I, there isn't any significant difference of weed control effect among the three treatments. Thus, reducing the dose rate without adding liquid fertilizer seems to be a sustainable solution. Concerning strategy II, treatments are significantly less effective than strategy I, especially after reducing the dose rate and the addition of liquid fertilizer doesn't compensate for this lack of effect.

Strawberries

Three assessments will be studied to compare the effects of the first treatment (A), 2 first treatments (A and B) and the effects of the last treatment C.

On the first assessment of the **23/06/2022,** concerning strategy I, there is a significant reduction in plant phytotoxicity between treatments 2 (16.3%) and 3 (0%). But there is also a significant increase between treatments 3 (0%) and 4 (20%). Treatments 4 and 2 are not significantly different, it means that a reduction of dose rate by half eliminated the effect of phytotoxicity on the plants, but an addition of liquid fertilizer increase it at the same level as a full dose herbicide treatment. In strategy II, there isn't any significant difference between treatments 5 and 6 but these differ significantly from treatment 7 which around 5 times higher than treatment 5 (full dose treatment). The results of plant vigor assessment on the 7 September showed no significant differences between treatments 2-7. The untreated control (treatment 1) resulted in lower vigor compared to treatments 2-7 (significant differences in some comparisons). This suggest that strawberries in treatments 2-7 could recover from the herbicide damage. The lower crop vigor for the untreated control can be explained as a result of competition from the weeds in the untreated plots. Concerning ***Thlaspi arvense*** (Field pennycress), in strategy I, there is a significant reduction between treatments 2 (93.8%) and 3 (76.3%) showing that a reduction of dose rate sprayed reduces weed control. However, an addition of liquid fertilizer improves significantly weed control (+21.7%), and no significant difference are showed between treatments 2 (93.8%) and 4 (98%). Thus, liquid nitrogen fertilizer seems to be an effective way of compensating an herbicide dose rate reduction (by half). In strategy II, there isn't any significant difference between treatments 5 (81.3%) and 6 (68.8%) but a tendency, meaning that the reduction of the dose rate by half seems to reduce weed control. There is a significant increase in weed control after the addition of liquid fertilizer in treatment 7 (68.8%) compared to treatment 6 (97.3%). And finally, no significant difference between

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treatments 5 and 7, even if it seems there is a higher weed control value in treatment 7. Liquid fertilizer can restore efficient weed control effect and seems to improve this effect compared to a treatment only herbicide based.

Concerning ***Urtica urens*** (Small nettle), in strategy I, there isn't any significant difference but when the dose is reduced there is a tendency to reduce weed control (70%) and it seems that an addition of liquid fertilizer improves the weed control effect (85%) without reaching the same efficacy as the full dose rate treatment (92.5%). In strategy II, no significant difference is observed between the three treatments, but it seems that when the dose rate is reduced there is a reduction in the weed control effect (70%) and an addition of liquid fertilizer seems to increase even more (93.8%), compared to the full dose spray (82.5%).

Concerning **other broad-leaved plants**, in strategy I, there isn't any significant difference but when the dose is reduced there is a tendency to reduce weed control (67.5%) and it seems that an addition of liquid fertilizer improves the weed control effect (81.3%) without reaching the same efficacy as the full dose rate treatment (86.3%). In strategy II, no significant difference is observed between the three treatments, but it seems that when the dose rate is reduced there is a reduction of the weed control effect (52.5%) and an addition of liquid fertilizer seems to increase even more (68.8 %), compared to the full dose spray (61.3%). It seems that liquid fertilizer could restore an acceptable level of weed control.

On the second assessment of the **29/06/2022,** concerning strategy I, a significant decrease of **plant phytotoxicity** on strawberry plants between treatments 2 and 3 is observed which is divided into around 4 times less with half the dose rate of herbicide. But after addition of liquid fertilizer there is a significant increase (around 3 times) between treatments 3 (half dose and without fertilizer) and 4 while there isn't any difference between treatments 2 and 4 meaning that the addition of liquid fertilizer damaged the strawberry plants as much as a full dose rate of herbicide during the 2 first treatments. Concerning strategy II, the reduction of the dose rate doesn't reduce significantly the phytotoxicity, but an addition of liquid fertilizer significantly increases the effect by around 4 or 5 times in treatment 7.

Concerning ***Thlaspi arvense*** (Field pennycress), in strategy I, the reduction of the dose rate between treatments 2 and 3 shows a significant reduction (from 98.5% to 88.8%) of the effect of weed control but an addition of liquid fertilizer during the previous treatments (A and B) permits to improve again the effect of the herbicide (99.8%) with any significant difference with treatment 2. In strategy II, the reduction of dose rate in treatment 6 doesn't impact significantly weed control but it seems there is a tendency to decrease it (from 99.3% to 95%) while an addition of liquid N fertilizer doesn't have any effect even if it seems there is a small increasing tendency (100%).

Concerning ***Urtica urens*** (Small nettle), in strategy I, there is a significant reduction of weed control between treatment 2 (99.5%) and treatment 3 (86%), meaning that the reduction in herbicide dose rate reduced the effect on the weed but an addition of liquid fertilizer increases significantly (96.8%, treatment 4) the effect on weed control at a half dose rate. This value is not significantly different than treatment 2. The addition of liquid fertilizer can compensate a reduction of 50% of the dose date in small nettle weed control. In strategy II, there isn't any significant difference between the three treatments even if it seems there is a slight tendency to reduce the effect on small nettle weed control when half of the dose rate is applied. It means that an utilization of an half dose rate has a similar effect on small nettle weed control than a full dose spray or an half dose + liquid fertilizer.

Concerning **other broad-leaved plants**, in strategy I, the reduction of dose rate between treatments 2 and 3 shows a significant decrease in weed control effect (from 95% to 81.3%) but an addition of liquid fertilizer permits to increase significantly weed control effect to reach 93.8%. This value doesn't show any significant difference with the 95% weed control of treatment 2. It means that an addition of liquid fertilizer in strategy I is a way to compensate a reduction of herbicide dose rate by half even after only two treatments realized among three planned. In strategy II, the reduction of the dose rate by half doesn't show any significant difference even if there is a tendency to decrease the effect on weed control. Furthermore, there isn't any significant difference between treatments 6 and 7 (addition of liquid fertilizer) and no difference between the full dose rate treatment 5 and treatment 7. It means that a full dose rate treatment or an addition of liquid fertilizer to a half dose rate treatment is not interesting to realize an efficient weed control on broad-leaved plants.

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On the third assessment of the **18/07/2022**, realized after application C, concerning **phytotoxicity** effect on strawberry plants, in strategy I, treatment 2 with herbicide strategy I resulted in rather high phytotoxicity, which was also observed in treatments 4 and 7 with liquid N fertilizer (30-33%). The treatment 5 with strategy II (full dose) and the treatments with reduced dose rate (3&6) resulted in a much lower phytotoxicity of 10-11%. A reduction in dose rate permits to reduce the phytotoxicity damages.

Concerning ***Thlaspi arvense*** (Field pennycress), in strategy I, there is a significant difference between treatments 2 (97.5%) and 3 (67.5%). And there is a significant increase in weed control after an addition of liquid fertilizer between treatments 3 (67.5%) and 4 (96.7%). But no difference between treatments 2 and 4. It means that a reduction of herbicides dose rates caused a reduction effect on weed control, but an addition of liquid fertilizer was able to compensate it and restored an equivalent effect as a full dose treatment. In strategy II, there isn't any significant difference between the three treatments except a slight decreasing tendency after a reduction of dose rate and it seems compensated by an addition of liquid fertilizer in treatment 7.

Concerning ***Urtica urens*** (small nettle), in strategy I, there is a significant reduction in weed control effect between treatments 2 (100%) and 3 (81.3%) but there isn't any difference between treatment 4 and the other ones. It means that after reduction of the date rate and an addition of liquid fertilizer the only effect is a tendency of increasing between treatments 3 (81.3%) and 4 (94%). In strategy II, there is no significant difference between the three treatments. But there is a tendency to reduce weed control effect between treatments 5 and 6 and a tendency to increase weed control effect after an addition of liquid fertilizer to the half dose rate treatment to level out the weed control level of treatment 5 with a full dose rate of herbicide spray. A half dose rate treatment seems to provide as much efficacy as a full dose herbicide treatment.

Concerning **other broad-leaved plants**, in strategy I, there isn't any significant difference between the three treatments. But it seems there is a tendency to reduce weed control effect when dose rate is reduced by 50% and an increase of effect after addition of liquid fertilizer to this half dose rate treatment even if it doesn't seem to level the full dose treatment. In strategy II, the same reasoning as strategy I is applied.

To conclude about the strawberry crop trial of 2022, it seems that an addition of liquid fertilizer in half dose rate treatment process could be a good solution to level out the efficacy of a full dose treatment process but phytotoxicity results showed that the liquid N fertilizer damage the plants as much as a full dose rate treatment (~30% > 25%) which is a very important value. The evolution of phytotoxicity along the three treatments in the different treatments, it seems that the product named Stomp CS has an important phytotoxic effect at full dose rate on the strawberry plants. When strategy I and II are compared, the full dose rate treatment is significantly worse than the half dose rate in strategy I but not in strategy II. The difference is that Stomp CS is not used in strategy II (even if Betanal is used) but it is in strategy I, thus it seems that it could be the one damaging more the crop. And in every treatment of both strategies, the addition of liquid fertilizer always causes more phytotoxic effects on the plants the half dose rate treatments (strategies I and II) or the full dose rate treatment (strategy II).

To conclude about the different spraying treatments during the trial. In strategy I, which uses Stomp CS, Boxer and Goltix WG, in most of the cases (67%) the reduction in the dose rate significantly reduces the effect on weed control. But an addition of liquid fertilizer significantly increases this effect to level out the full dose rate treatment. About strategy II, in most of the cases (89%), the reduction of the dose rate by half doesn't significantly reduce the effectiveness of weed control except in treatment A for *Thlaspi arvense.* It seems that Betanal herbicide has a very strong effect on weeds and show an interesting improvement on weed control effect compared to strategy I which doesn't contain this product even at a lower dose rate.

Concerning the vigor of the strawberry plants assessed almost two months after the last treatment, there isn't any significant difference about the three treatments of each strategy, but it seems that an addition of liquid fertilizer reduces slightly (0.2% for I and 3.8% for II) the vigor of the plants. It seems that despite significant differences in plant phytotoxicity between conditions 2-7, there are similar and unsignificant plant vigor values which can be explained by a recovery of the damaged plants.

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Four assessments will be studied to compare the effects of these different strategies on weed control through 4 data assessments, the first one just after treatment F, the second one just after treatment G, the third one, one week after treatment H and the last one, three weeks after treatment I.

Concerning phytotoxicity, none of the four assessments show significant difference in both strategies. However, there are some tendencies. In the strategy II of the first assessment, it seems that a reduction of the dose rate reduces the phytotoxicity effect while an addition of liquid fertilizer is more damaging than a full dose rate spray. It seems that there is a decrease of the effect at assessment number four. In strategy I, it decreases from 15% in treatment 2 to 0% in treatment 3 and increases again to 2.5% in treatment 4. And in strategy II, it decreases from 7.5% in treatment 5 to 5% in treatments 6 and 7. To conclude, it seems that the last assessment shows an interesting reduction of phytotoxicity compared to the other three ones but it's important to note that the last assessment was done 3 weeks after the last treatment (I), which means that the crop could have recovered from previous damages for instance.

On the first assessment on the **30/05/2022**, concerning ***Chenopodium album*** (Fat hen) in strategy I, there isn't any significant difference between the three treatments, but it seems that there is a reduction of effect (85%) when the dose is reduced, and an addition of liquid fertilizer doesn't compensate this lack of herbicide (88.8%). In strategy II, there isn't any significant difference, but it seems that a reduction of the dose rate decreases the effectiveness (86.8%) while an addition of liquid fertilizer seems to improve (97.3%) it and almost level out the full dose rate treatment (100%). To conclude, strategy II seems a little bit more efficient than strategy I.

Concerning ***Poa annua*** (Annual bluegrass), in strategy I, there is a significant reduction between treatment 2 (86.3%) and treatment 3 (38.3%). This reduction isn't compensated by an addition of liquid fertilizer (37.5%). In strategy II, there is a significant reduction between treatment 5 (92.5%) and treatment 6 (63.8%). And an addition of liquid fertilizer (treatment 7) doesn't compensate this lack of effect (65%) compared to treatment 5. To conclude, strategy II is significantly more effective than strategy I (28% difference).

Concerning ***Viola arvensis*** (Field pansy), in strategy I, there is a significant reduction in the spray effect from treatment 2 (99.8%) to treatment 3 (48.3%) but after an addition of liquid fertilizer there isn't any significant difference between treatments 3 and 4 (58.8%). In strategy II, there isn't any significant difference between treatments 5 (75%) and 6 (56.3%) and neither between 6 and 7 (46.3%) but there a significant difference between 5 and 7 showing that liquid fertilizer can't compensate the reduction of the dose rate by half. To conclude, it seems that none of the strategies can provide a strong weed control effect against field pansy.

Concerning **other broad-leaved plants**, in strategy I, there isn't a significant difference between treatments 2 (90%) and 3 (70%) even if there is a slight reduction tendency. Between treatments 3 and 4 (51.3%), it seems there is a reduction of effect after the addition of liquid fertilizer. In strategy II, there is a significant reduction between treatments 5 (86.3%) and 6 (58.8%). But there isn't any significant difference between treatments 6 and 7 (57.5%).
To conclude, in both strategies an addition of liquid fertilizer doesn't compensate the reduction of the dose rate.

On the second assessment on the **08/06/2022**, concerning ***Chenopodium album***, in strategies I and II there isn't any significant difference among the different treatments. It seems that the reduction of dose rate by two provides the same effect as a full dose treatment in both strategies.

Concerning **Poa annua**, in strategy I, there are significant differences between treatments 2 (93%) and 3 (48.8%) and another one between treatments 2 and 4 (50%). But there isn't any significant difference between treatments 3 and 4. It means that a reduction of dose rate is not compensated by an addition of liquid fertilizer. In strategy II, there are significant differences between treatments 5 (96.8%) and 6 (61.3%) and another one between treatments 5 and 7 (65%). But there isn't any significant difference between treatments 6 and 7. It means that a reduction of dose rate is not compensated by an addition of liquid fertilizer.

Concerning **Viola arvensis**, in strategy I, there are significant differences between treatments 2 (100%) and 3 (71.3%) and another one between treatments 2 and 4 (72.5%). But there isn't any significant difference between

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treatments 3 and 4. In strategy II, there are significant differences between treatments 5 (92.8%) and 6 (62.5%) and another one between treatments 2 and 4 (62.5%). But there isn't any significant difference between treatments 3 and 4. It means that a reduction of dose rate is not compensated by an addition of liquid fertilizer. A half dose rate treatment is not sufficient to control this weed even with an addition of liquid fertilizer compared to a full dose treatment.

Concerning **broad-leaved plants**, in strategy I, there isn't any significant difference between treatments 2 (93%) and 3 (75%) and between 2 and 4 (68.8%). In strategy II, there is a similar scheme with no significant difference between treatments 5 (93%) and 6 (71.3%) and between 5 and 7 (76.3%). A reduction of the dose rate even paired with an addition of liquid fertilizer is not sufficient to level out the effect of the full dose rate treatment in each strategy.

On the third assessment on the **24/06/2022**, concerning ***Chenopodium album*** in strategy I, there isn't any significant difference between the three treatments (2, 3 and 4). And in strategy II, there isn't any significant difference between the three treatments neither. A reduction of the dose rate doesn't impact the effect on weed control here.

Concerning ***Poa annua***, in strategy I, there is a significant difference (-55.5%) between treatments 2 (90.5%) and 3 (35%) when the dose rate is reduced. There is a significant difference between treatments 3 and 4 (56.3%) and between 2 and 4. Addition of liquid fertilizer seems to improve the efficacy, but it doesn't reach the same level as the full dose rate treatment (treatment 5). In strategy II, there is a significant difference between treatments 5 (95.5%) and 6 (63.8%) but there isn't any significant difference between treatments 6 and 7 (68.8%). And there is a significant difference between treatments 5 and 7. A n addition of liquid fertilizer when dose rate is reduced doesn't compensate for a lack of weed control effect on annual bluegrass.

Concerning ***Viola arvensis***, in strategy I, there is a significant reduction between treatments 2 (100%) and 3 (58.8%) and between treatments 2 and 4 (67.5%). But there isn't any significant difference between treatments 3 and 4. In strategy II, there is a significant reduction (52%) between treatments 5 (89.3%) and 6 (42.5%). An addition of liquid fertilizer just allows to compensate 10% of the effect reduction in treatment 7 (52.5%). In both strategies, an addition of liquid fertilizer doesn't compensate for the reduced efficacy caused by of the dose rate reduction.

Concerning **other broad-leaved plants**, in strategy I, there isn't any significant difference between the three treatments. However, there are some tendencies, it seems that a reduction of dose rate reduces weed control effect by 27.2% between treatments 2 (90.5%) and 3 (66.3%), while an addition of liquid fertilizer seems to improve the effectiveness by 7.5% in treatment 4 (73.8%). The same tendencies are present in strategy II, it seems that a reduction of dose rate reduces weed control effect by 18.8 % between treatments 5 (91.3%) and 6 (72.5%), while an addition of liquid fertilizer seems to improve the effectiveness by 6.3% in treatment 7 (78.8%). The reduction of dose rate seems to strongly reduce the effect of the treatment and an addition of liquid fertilizer doesn't seem to compensate enough in both strategies.

On the fourth assessment on the **22/07/2022**, concerning ***Chenopodium album*** in strategy I, there isn't any significant difference between the three treatments, but some tendencies can be observed. It seems that there is a reduction of 26.2% between treatments 2 (100%) and 3 (73.8%). And a rise of 21.2% between treatments 3 and 4 (95%). In strategy II, the same tendencies are shown. It seems that there is a reduction of 15% between treatments 5 (100%) and 6 (85%). And a rise of 8.8% between treatments 3 and 4 (93.8%). The tangible tendency, common to both strategies is that liquid fertilizer at this dose rate doesn't compensate a reduction of herbicide dose rate by half.

Concerning ***Poa annua***, in strategy I, there is a significant reduction between treatments 2 (91.5%) and 3 (5%), while there is only an increasing tendency between treatments 3 and 4 (26.3%). The treatment seems to be unavoidable to control this weed. In strategy II, a reduction of dose rate by half between treatments 5 (94.3%) and 6 (45%) significantly reduces effectiveness by half, while an addition of liquid fertilizer only seems to increase effectiveness by 2.5% in treatment 7 (47.5%) compared to 6. This value is also significantly different than treatment 5's value. To conclude, liquid fertilizer doesn't seem to be a good alternative to the dose rate reduction of the herbicide treatment.

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Concerning ***Viola arvensis***, in strategy I, there is a significant reduction between treatments 2 (100%) and 3 (48.8%) but no significant difference between treatments 3 and 4 (66.3%) and between 2 and 4. Liquid fertilizer is not able to compensate for the reduction of herbicide dose rate. In strategy II, the reduction of dose rate causes a significant reduction in treatment 6 (22.5%) which isn't compensate by liquid fertilizer addition in treatment 7 (26.3%) compared to treatment 5 (86.3%). Liquid fertilizer addition doesn't level the efficacy of full dose rate treatment.

Concerning **Broad-leaved plants**, in strategy I, there isn't any significant difference between the three treatments. However, there are some tendencies, it seems that a reduction of dose rate reduces weed control effect by 24.3% between treatments 2 (94.3%) and 3 (70%), while an addition of liquid fertilizer seems to reduce the effectiveness by 2.5% in treatment 4 (67.5%). Tendencies are present in strategy II, it seems that a reduction of dose rate reduces weed control effect by 25.7 % between treatments 5 (89.5%) and 6 (63.8%), while an addition of liquid fertilizer seems to improve the effectiveness by 5% in treatment 7 (68.8%). The reduction of dose rate seems to strongly reduce the effect of the treatment and an addition of liquid fertilizer doesn't seem to compensate enough in both strategies.

About **yield** assessments, there isn't any significant difference among both strategies compared to control, even if treatment 2 (10,588kg) seems to be slightly lower by 1kg compared to treatments 3 (11.525kg) and 4 (11.3kg). Both treatment strategies don't seem to affect fresh weight parameter in this trial.

The same scheme is shown in **yield per hectare** assessment. No significant difference is visible among the treatments. Treatment 2 (52.9 t/ha) seems to be lower than treatments 3 (57.6 t/ha) and 4 (56.5% t/ha) and compared to control (56.8 t/ha). The treatment strategies don't seem to impact onion yield per hectare.

About **number of onions** in $2m^2$, no significant reduction is determined but almost all treatments show a tendency to reduced number of onions (up to 30 onions per sample). Only one treatment (6 in strategy II with 185.8 onions) seems to be superior compared to control (180 onions). It seems that herbicide strategies don't affect the number of onions in the plot areas.

To conclude about this onion trial, for most treatments and weeds studied there isn't any significant reduction of weed control effect even when the dose rate was reduced, or liquid fertilizer was added. Even if against *Viola arvensis* the full dose treatment seems to be unavoidable to ensure an effective weed control, it's not always the case for all spraying timings. About other parameters and phytotoxicity, the different treatments and strategies don't impact the values and an addition of liquid fertilizer doesn't increase the damages on the onion crops.

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Flydende N markforsøg løg

Trial ID:22404 Location:Flakkebjerg Trial Year:2022
Protocol ID:22404 Investigator:Andrius Hansen Kemezys
Project ID:35420 Study Director:
Sponsor Contact:

General Trial Information

Investigator: Andrius Hansen Kemezys

Discipline:H herbicide
Trial Status:E established
ARM Trial Created On:19-04-2022

Trial Location
City:AU Flakkebjerg **Country:**DNK Denmark
State/Prov.: Slagelse
Postal Code:4200

Latitude of LL Corner °:55,317756
Longitude of LL Corner °:11,383583

Conducted Under GLP: No
Conducted Under GEP: Yes

Investigator: Andrius Hansen Kemezys

Crop Description

Harvested Width:1 m
Harvested Length:2 m

Site and Design

Treated Plot Width:4 m
Treated Plot Length:6 m
Treated Plot Area:24 m2 **Treatments:**7
Replications:4 **Study Design:**RACOBL Randomized Complete Block (RCB)

Application Description

	B	C	D	E	F	G	H	I
Application Date:	05-05-2022	10-05-2022	18-05-2022	23-05-2022	30-05-2022	08-06-2022	17-06-2022	29-06-2022
Appl. Start Time:	10:30	12:45	10:00		11:00	11:30	09:00	
Appl. Stop Time:	11:10	13:20	10:40		11:30	12:30	10:00	
Applied By:	AHK	AHK	Jesper		Jesper	AHK	Jesper	
Appl. Entry Date:	15-08-2022	15-08-2022	15-08-2022	15-08-2022	15-08-2022	15-08-2022	22-11-2022	21-11-2022
Air Temperature Start, Stop:	13; - C	20,5; - C	16,8; - C		15; - C	16,9; - C	15; - C	
% Relative Humidity Start, Stop:	49; -	43,8; -	46,3; -		66,5; -	65; -	65; -	
Wind Velocity+Dir., Start:	1,2 MPS; NW	4 MPS; -	5,1 MPS; SE		3 MPS; -	1,3 MPS; SW	1,2 MPS; SW	
Wet Leaves (Y/N):			N; no				N; no	
Soil Temperature, Unit:	14 C	17,5 C	15,7 C		14,5 C	17,1 C	15 C	
% Cloud Cover:		100	5		100	5	5	

Application Equipment

	A	B	C	D	E	F	G	H	I
Appl. Equipment:	bicyc.spraye	Selvkørende	Selvkørende	Selvkørende	Selvkørende	Selvkørende	Selvkørende	Selvkørende	Selvkørende
Equipment Type:	SPRBIC	SPRAYE	SPRAYE	SPRAYE	SPRAYE	SPRAYE	SPRAYE	SPRAYE	SPRAYE
Operation Pressure:		3.8 BAR	3.8 BAR	3.8 BAR	3.8 BAR	3.8 BAR	3.8 BAR	3.8 BAR	3.8 BAR
Nozzle Type:	Hardi	Hardi	Hardi	Hardi	Hardi	Hardi	Hardi	Hardi	Hardi
Nozzle Size:	LD015-110	LD015-110	LD015-110	LD015-110	LD015-110	LD015-110	LD015-110	LD015-110	LD015-110
Nozzle Spacing:		50 cm	50 cm	50 cm	50 cm	50 cm	50 cm	50 cm	50 cm
Nozzles/Row:	3	5	5	5	5	5	5	5	5
Boom Length:		2.5 cm	25 cm	25 cm	25 cm	25 cm	25 cm	25 cm	25 cm
Boom Height:		50 cm	50 cm	50 cm	50 cm	50 cm	50 cm	50 cm	50 cm
Ground Speed:		3.7 KPH	3.7 KPH	3.7 KPH	3.7 KPH	3.7 KPH	3.7 KPH	3.7 KPH	3.7 KPH
Carrier:		WATER	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Spray Volume:		200 L/ha	200 L/ha	200 L/ha	200 L/ha	200 L/ha	200 L/ha	200 L/ha	200 L/ha
Mix Size:		4 liters	4 liters	4 liters	4 liters	4 liters	4 liters	4 liters	4 liters

Date	By	Context	Notes
19-04-2022	Andrius Hansen Kemezys	STATUS	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
30-05-2022	Andrius Hansen Kemezys	STATUS	Automatically added by ARM: Trial Status changed to: E: changed by (XDAKEA).
30-05-2022	Andrius Hansen Kemezys	STATUS	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

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Pest Type				W; Weed	W; Weed	W; Weed	W; Weed	W; Weed
Pest Code				CHEAL	CHEAL	CHEAL	CHEAL	POAAN
Pest Scientific Name				Chenopodium album	Chenopodium album	Chenopodium album	Chenopodium album	Poa annua
Pest Name				fat-hen	fat-hen	fat-hen	fat-hen	Annual bluegrass
Crop Code				ALLXS	ALLXS	ALLXS	ALLXS	ALLXS
BBCH Scale				BVBT	BVBT	BVBT	BVBT	BVBT
Crop Name				Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion
Rating Date				30-05-2022	08-06-2022	24-06-2022	22-07-2022	30-05-2022
Rating Type				CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit				%	%	%	%	%
Number of Subsamples				1	1	1	1	1
Data Entry Date				08-06-2022	08-06-2022	21-11-2022	22-11-2022	08-06-2022
Days After First/Last Applic.				-; 0	-; 0	-; 7	-; 23	-; 0
Trt-Eval Interval				0 DA-F	0 DA-G	7 DA-H	23 DA-I	0 DA-F
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	2	7	11	17	3
1	Untreated Check								
	60 kgN/ha			A					
2	60 kgN/ha			A	100,0a	100,0a	100,0a	100,0a	86,3a
	Stomp CS	1,6	L/ha	B					
	Fenix	0,4	L/ha	B					
	Boxer	0,5	L/ha	C					
	Boxer	0,5	L/ha	D					
	Fenix	0,1	L/ha	D					
	Boxer	0,5	L/ha	E					
	Boxer	0,5	L/ha	F					
	Fenix	0,2	L/ha	F					
	Boxer	0,5	L/ha	G					
	Lentagran 45 WP	0,2	kg/ha	G					
	Fenix	0,3	L/ha	H					
	Lentagran 45 WP	0,5	kg/ha	H					
	Lentagran 45 WP	1	kg/ha	I					
3	60 kgN/ha			A	85,0a	98,0a	100,0a	73,8a	38,3c
	Stomp CS	0,8	L/ha	B					
	Fenix	0,2	L/ha	B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	Boxer	0,25	L/ha	G					
	Lentagran 45 WP	0,1	kg/ha	G					
	Fenix	0,15	L/ha	H					
	Lentagran 45 WP	0,25	kg/ha	H					
	Lentagran 45 WP	0,5	kg/ha	I					
4	60 kgN/ha			A	88,8a	95,0a	97,5a	95,0a	37,5c
	Stomp CS	0,8	L/ha	B					
	Fenix	0,2	L/ha	B					
	27 kgN/ha			B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	20 kgN/ha			D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	20 kgN/ha			F					
	Boxer	0,25	L/ha	G					
	Lentagran 45 WP	0,1	kg/ha	G					
	Fenix	0,15	L/ha	H					
	Lentagran 45 WP	0,25	kg/ha	H					
	Lentagran 45 WP	0,5	kg/ha	I					

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Pest Type			W; Weed	W; Weed	W; Weed	W; Weed	W; Weed
Pest Code			CHEAL	CHEAL	CHEAL	CHEAL	POAAN
Pest Scientific Name			Chenopodium album	Chenopodium album	Chenopodium album	Chenopodium album	Poa annua
Pest Name			fat-hen	fat-hen	fat-hen	fat-hen	Annual bluegrass
Crop Code			ALLXS	ALLXS	ALLXS	ALLXS	ALLXS
BBCH Scale			BVBT	BVBT	BVBT	BVBT	BVBT
Crop Name			Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion
Description							
Rating Date			30-05-2022	08-06-2022	24-06-2022	22-07-2022	30-05-2022
Rating Type			CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit			%	%	%	%	%
Sample Size, Unit							
Number of Subsamples			1	1	1	1	1
Data Entry Date			08-06-2022	08-06-2022	21-11-2022	22-11-2022	08-06-2022
Days After First/Last Applic.			-; 0	-; 0	-; 7	-; 23	-; 0
Trt-Eval Interval			0 DA-F	0 DA-G	7 DA-H	23 DA-I	0 DA-F
ARM Action Codes							
Number of Decimals							
Trt No.	Treatment Name	Rate Rate Unit	Appl Code	2	7	11	17	3
5	60 kgN/ha		A	100,0a	100,0a	100,0a	100,0a	92,5a
	Goltix 70 WG	1kg/ha	B					
	Boxer	0,5L/ha	C					
	Boxer	0,5L/ha	D					
	Fenix	0,1L/ha	D					
	Boxer	0,5L/ha	E					
	Boxer	0,5L/ha	F					
	Fenix	0,2L/ha	F					
6	60 kgN/ha		A	86,8a	97,8a	95,8a	85,0a	63,8b
	Goltix 70 WG	0,5kg/ha	B					
	Boxer	0,25L/ha	C					
	Boxer	0,25L/ha	D					
	Fenix	0,05L/ha	D					
	Boxer	0,25L/ha	E					
	Boxer	0,25L/ha	F					
	Fenix	0,1L/ha	F					
7	60 kgN/ha		A	97,3a	98,8a	97,5a	93,8a	65,0b
	Goltix 70 WG	0,5kg/ha	B					
	27 kgN/ha		B					
	Boxer	0,25L/ha	C					
	Boxer	0,25L/ha	D					
	Fenix	0,05L/ha	D					
	20 kgN/ha		D					
	Boxer	0,25L/ha	E					
	Boxer	0,25L/ha	F					
	Fenix	0,1L/ha	F					
	20 kgN/ha		F					
LSD P=.05				13,16	5,67	4,06	32,01	10,92
Standard Deviation				8,68	3,76	2,70	21,24	7,20
CV				9,33	3,83	2,74	23,28	11,27
Grand Mean				92,96	98,25	98,46	91,25	63,89
Levene's F				0,962	0,74	1,839	0,884	2,877*
Rank X2				.	.	.	.	.
P(Rank X2)				.	.	.	.	.
Replicate F				1,959	3,183	2,193	1,198	3,069
Replicate Prob(F)				0,1665	0,0546	0,1312	0,3444	0,0626
Treatment F				2,521	0,975	1,795	0,920	41,158
Treatment Prob(F)				0,0792	0,4643	0,1744	0,4947	0,0001

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns: Average=2,3,4,5,1,16

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Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	8	13	18	4	9
	Pest Type				W; Weed	W; Weed	W; Weed	W; Weed	W; Weed
	Pest Code				POAAN	POAAN	VIOAR	VIOAR	VIOAR
	Pest Scientific Name				Poa annua	Poa annua	Viola arvensis	Viola arvensis	Viola arvensis
	Pest Name				Annual bluegrass	Annual bluegrass	Field pansy	Field pansy	Field pansy
	Crop Code				ALLXS	ALLXS	ALLXS	ALLXS	ALLXS
	BBCH Scale				BVBT	BVBT	BVBT	BVBT	BVBT
	Crop Name				Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion
	Rating Date				08-06-2022	24-06-2022	22-07-2022	30-05-2022	08-06-2022
	Rating Type				CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit				%	%	%	%	%
	Sample Size, Unit								
	Number of Subsamples				1	1	1	1	1
	Data Entry Date				08-06-2022	21-11-2022	22-11-2022	08-06-2022	08-06-2022
	Days After First/Last Applic.				-; 0	-; 7	-; 23	-; 0	-; 0
	Trt-Eval Interval				0 DA-G	7 DA-H	23 DA-I	0 DA-F	0 DA-G
1	Untreated Check								
	60 kgN/ha			A					
2	60 kgN/ha			A	93,0a	90,5a	100,0a	99,8a	100,0a
	Stomp CS	1,6	L/ha	B					
	Fenix	0,4	L/ha	B					
	Boxer	0,5	L/ha	C					
	Boxer	0,5	L/ha	D					
	Fenix	0,1	L/ha	D					
	Boxer	0,5	L/ha	E					
	Boxer	0,5	L/ha	F					
	Fenix	0,2	L/ha	F					
	Boxer	0,5	L/ha	G					
	Lentagran 45 WP	0,2	kg/ha	G					
	Fenix	0,3	L/ha	H					
	Lentagran 45 WP	0,5	kg/ha	H					
	Lentagran 45 WP	1	kg/ha	I					
3	60 kgN/ha			A	48,8c	35,0c	48,8bc	48,3c	71,3b
	Stomp CS	0,8	L/ha	B					
	Fenix	0,2	L/ha	B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	Boxer	0,25	L/ha	G					
	Lentagran 45 WP	0,1	kg/ha	G					
	Fenix	0,15	L/ha	H					
	Lentagran 45 WP	0,25	kg/ha	H					
	Lentagran 45 WP	0,5	kg/ha	I					
4	60 kgN/ha			A	50,0c	56,3b	66,3ab	58,8bc	72,5b
	Stomp CS	0,8	L/ha	B					
	Fenix	0,2	L/ha	B					
	27 kgN/ha			B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	20 kgN/ha			D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	20 kgN/ha			F					
	Boxer	0,25	L/ha	G					
	Lentagran 45 WP	0,1	kg/ha	G					
	Fenix	0,15	L/ha	H					
	Lentagran 45 WP	0,25	kg/ha	H					
	Lentagran 45 WP	0,5	kg/ha	I					

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Trt No.	Treatment Name	Rate	Unit	Appl Code	8	13	18	4	9
	Pest Type				W; Weed	W; Weed	W; Weed	W; Weed	W; Weed
	Pest Code				POAAN	POAAN	VIOAR	VIOAR	VIOAR
	Pest Scientific Name				Poa annua	Poa annua	Viola arvensis	Viola arvensis	Viola arvensis
	Pest Name				Annual bluegrass	Annual bluegrass	Field pansy	Field pansy	Field pansy
	Crop Code				ALLXS	ALLXS	ALLXS	ALLXS	ALLXS
	BBCH Scale				BVBT	BVBT	BVBT	BVBT	BVBT
	Crop Name				Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion
	Description								
	Rating Date				08-06-2022	24-06-2022	22-07-2022	30-05-2022	08-06-2022
	Rating Type				CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
	Rating Unit				%	%	%	%	%
	Sample Size, Unit								
	Number of Subsamples				1	1	1	1	1
	Data Entry Date				08-06-2022	21-11-2022	22-11-2022	08-06-2022	08-06-2022
	Days After First/Last Applic.				-; 0	-; 7	-; 23	-; 0	-; 0
	Trt-Eval Interval				0 DA-G	7 DA-H	23 DA-I	0 DA-F	0 DA-G
	ARM Action Codes								
	Number of Decimals								
5	60 kgN/ha			A	96,8a	95,5a	86,3ab	75,0b	92,8a
	Goltix 70 WG	1	kg/ha	B					
	Boxer	0,5	L/ha	C					
	Boxer	0,5	L/ha	D					
	Fenix	0,1	L/ha	D					
	Boxer	0,5	L/ha	E					
	Boxer	0,5	L/ha	F					
	Fenix	0,2	L/ha	F					
6	60 kgN/ha			A	61,3b	63,8b	22,5c	56,3bc	62,5b
	Goltix 70 WG	0,5	kg/ha	B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
7	60 kgN/ha			A	65,0b	68,8b	26,3c	46,3c	62,5b
	Goltix 70 WG	0,5	kg/ha	B					
	27 kgN/ha			B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	20 kgN/ha			D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	20 kgN/ha			F					
	LSD P=.05				9,59	21,15	32,05	18,36	8,22
	Standard Deviation				6,36	14,04	21,27	12,11	5,46
	CV				9,2	20,55	36,46	18,9	7,09
	Grand Mean				69,13	68,29	58,33	64,06	76,92
	Levene's F				3,957*	2,757	2,215	3,822*	2,836*
	Rank X2				.	.	.	.	.
	P(Rank X2)				.	.	.	.	.
	Replicate F				2,913	2,296	1,450	0,845	3,065
	Replicate Prob(F)				0,0688	0,1193	0,2680	0,4920	0,0603
	Treatment F				43,371	10,183	8,816	11,172	33,604
	Treatment Prob(F)				0,0001	0,0002	0,0005	0,0002	0,0001

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns: Average=2,3,4,5,1,16

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Pest Type					W; Weed	W; Weed	W; Weed	W; Weed	W; Weed
Pest Code					VIOAR	BBBBB	BBBBB	BBBBB	BBBBB
Pest Scientific Name					Viola arvensis	Broad-leaved plants	Broad-leaved plants	Broad-leaved plants	Broad-leaved plants
Pest Name					Field pansy	Broad-leaved plants	Broad-leaved plants	Broad-leaved plants	Broad-leaved plants
Crop Code					ALLXS	ALLXS	ALLXS	ALLXS	ALLXS
BBCH Scale					BVBT	BVBT	BVBT	BVBT	BVBT
Crop Name					Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion
Rating Date					24-06-2022	30-05-2022	08-06-2022	24-06-2022	22-07-2022
Rating Type					CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit					%	%	%	%	%
Sample Size, Unit									
Number of Subsamples					1	1	1	1	1
Data Entry Date					21-11-2022	08-06-2022	08-06-2022	21-11-2022	22-11-2022
Days After First/Last Applic.					-; 7	-; 0	-; 0	-; 7	-; 23
Trt-Eval Interval					7 DA-H	0 DA-F	0 DA-G	7 DA-H	23 DA-I
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	12	5	10	14	19
1	Untreated Check								
	60 kgN/ha			A					
2	60 kgN/ha			A	100,0a	90,0a	93,0a	90,5a	94,3a
	Stomp CS	1,6	L/ha	B					
	Fenix	0,4	L/ha	B					
	Boxer	0,5	L/ha	C					
	Boxer	0,5	L/ha	D					
	Fenix	0,1	L/ha	D					
	Boxer	0,5	L/ha	E					
	Boxer	0,5	L/ha	F					
	Fenix	0,2	L/ha	F					
	Boxer	0,5	L/ha	G					
	Lentagran 45 WP	0,2	kg/ha	G					
	Fenix	0,3	L/ha	H					
	Lentagran 45 WP	0,5	kg/ha	H					
	Lentagran 45 WP	1	kg/ha	I					
3	60 kgN/ha			A	58,8b	70,0ab	75,0b	66,3a	70,0a
	Stomp CS	0,8	L/ha	B					
	Fenix	0,2	L/ha	B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	Boxer	0,25	L/ha	G					
	Lentagran 45 WP	0,1	kg/ha	G					
	Fenix	0,15	L/ha	H					
	Lentagran 45 WP	0,25	kg/ha	H					
	Lentagran 45 WP	0,5	kg/ha	I					
4	60 kgN/ha			A	67,5b	51,3b	68,8b	73,8a	67,5a
	Stomp CS	0,8	L/ha	B					
	Fenix	0,2	L/ha	B					
	27 kgN/ha			B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	20 kgN/ha			D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	20 kgN/ha			F					
	Boxer	0,25	L/ha	G					
	Lentagran 45 WP	0,1	kg/ha	G					
	Fenix	0,15	L/ha	H					
	Lentagran 45 WP	0,25	kg/ha	H					
	Lentagran 45 WP	0,5	kg/ha	I					

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Pest Type					W; Weed	W; Weed	W; Weed	W; Weed	W; Weed
Pest Code					VIOAR	BBBBB	BBBBB	BBBBB	BBBBB
Pest Scientific Name					Viola arvensis	Broad-leaved plants	Broad-leaved plants	Broad-leaved plants	Broad-leaved plants
Pest Name					Field pansy	Broad-leaved plants	Broad-leaved plants	Broad-leaved plants	Broad-leaved plants
Crop Code					ALLXS	ALLXS	ALLXS	ALLXS	ALLXS
BBCH Scale					BVBT	BVBT	BVBT	BVBT	BVBT
Crop Name					Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion
Description									
Rating Date					24-06-2022	30-05-2022	08-06-2022	24-06-2022	22-07-2022
Rating Type					CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit					%	%	%	%	%
Sample Size, Unit									
Number of Subsamples					1	1	1	1	1
Data Entry Date					21-11-2022	08-06-2022	08-06-2022	21-11-2022	22-11-2022
Days After First/Last Applic.					-; 7	-; 0	-; 0	-; 7	-; 23
Trt-Eval Interval					7 DA-H	0 DA-F	0 DA-G	7 DA-H	23 DA-I
ARM Action Codes									
Number of Decimals									
Trt No.	Treatment Name	Rate	Unit	Appl Code	12	5	10	14	19
5	60 kgN/ha			A	89,3a	86,3a	93,0a	91,3a	89,5a
	Goltix 70 WG	1	kg/ha	B					
	Boxer	0,5	L/ha	C					
	Boxer	0,5	L/ha	D					
	Fenix	0,1	L/ha	D					
	Boxer	0,5	L/ha	E					
	Boxer	0,5	L/ha	F					
	Fenix	0,2	L/ha	F					
6	60 kgN/ha			A	42,5b	58,8b	71,3b	72,5a	63,8a
	Goltix 70 WG	0,5	kg/ha	B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
7	60 kgN/ha			A	52,5b	57,5b	76,3b	78,8a	68,8a
	Goltix 70 WG	0,5	kg/ha	B					
	27 kgN/ha			B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	20 kgN/ha			D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	20 kgN/ha			F					
LSD P=.05					19,00	16,77	10,97	21,41	22,99
Standard Deviation					12,61	11,06	7,28	14,21	15,26
CV					18,43	16,03	9,15	18,02	20,17
Grand Mean					68,42	68,96	79,54	78,83	75,63
Levene's F					1,483	1,251	0,737	1,327	1,637
Rank X2					.	.	.	.	.
P(Rank X2)					.	.	.	.	.
Replicate F					2,381	1,145	1,806	1,939	3,669
Replicate Prob(F)					0,1104	0,3653	0,1894	0,1666	0,0366
Treatment F					12,331	8,455	8,737	2,039	2,837
Treatment Prob(F)					0,0001	0,0007	0,0005	0,1309	0,0535

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns: Average=2,3,4,5,1,16

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Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1	6	15	16	23
Crop Code					ALLXS	ALLXS	ALLXS	ALLXS	ALLXS
BBCH Scale					BVBT	BVBT	BVBT	BVBT	BVBT
Crop Name					Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion
Description									Without tare
Rating Date					30-05-2022	08-06-2022	24-06-2022	22-07-2022	06-09-2022
Rating Type					PHYGEN	PHYGEN	PHYGEN	PHYGEN	YIELD
Rating Unit					%	%	%	%	T-MET
Sample Size, Unit									1 ha
Number of Subsamples					1	1	1	1	1
Data Entry Date					08-06-2022	08-06-2022	21-11-2022	22-11-2022	
Days After First/Last Applic.					-; 0	-; 0	-; 7	-; 23	-; 69
Trt-Eval Interval					0 DA-F	0 DA-G	7 DA-H	23 DA-I	
ARM Action Codes									TY2
Number of Decimals									1
1	Untreated Check				0,0b	0,0b			56,8a
	60 kgN/ha			A					
2	60 kgN/ha			A	22,5a	23,8a	22,5a	15,0a	52,9a
	Stomp CS	1,6	L/ha	B					
	Fenix	0,4	L/ha	B					
	Boxer	0,5	L/ha	C					
	Boxer	0,5	L/ha	D					
	Fenix	0,1	L/ha	D					
	Boxer	0,5	L/ha	E					
	Boxer	0,5	L/ha	F					
	Fenix	0,2	L/ha	F					
	Boxer	0,5	L/ha	G					
	Lentagran 45 WP	0,2	kg/ha	G					
	Fenix	0,3	L/ha	H					
	Lentagran 45 WP	0,5	kg/ha	H					
	Lentagran 45 WP	1	kg/ha	I					
3	60 kgN/ha			A	20,0a	27,5a	20,0a	0,0a	57,6a
	Stomp CS	0,8	L/ha	B					
	Fenix	0,2	L/ha	B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	Boxer	0,25	L/ha	G					
	Lentagran 45 WP	0,1	kg/ha	G					
	Fenix	0,15	L/ha	H					
	Lentagran 45 WP	0,25	kg/ha	H					
	Lentagran 45 WP	0,5	kg/ha	I					
4	60 kgN/ha			A	22,5a	27,5a	11,3a	2,5a	56,5a
	Stomp CS	0,8	L/ha	B					
	Fenix	0,2	L/ha	B					
	27 kgN/ha			B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	20 kgN/ha			D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	20 kgN/ha			F					
	Boxer	0,25	L/ha	G					
	Lentagran 45 WP	0,1	kg/ha	G					
	Fenix	0,15	L/ha	H					
	Lentagran 45 WP	0,25	kg/ha	H					
	Lentagran 45 WP	0,5	kg/ha	I					

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Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1	6	15	16	23
Pest Type									
Pest Code									
Pest Scientific Name									
Pest Name									
Crop Code					ALLXS	ALLXS	ALLXS	ALLXS	ALLXS
BBCH Scale					BVBT	BVBT	BVBT	BVBT	BVBT
Crop Name					Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion	Direct seeded onion
Description									Without tare
Rating Date					30-05-2022	08-06-2022	24-06-2022	22-07-2022	06-09-2022
Rating Type					PHYGEN	PHYGEN	PHYGEN	PHYGEN	YIELD
Rating Unit					%	%	%	%	T-MET
Sample Size, Unit									1 ha
Number of Subsamples					1	1	1	1	1
Data Entry Date					08-06-2022	08-06-2022	21-11-2022	22-11-2022	
Days After First/Last Applic.					-; 0	-; 0	-; 7	-; 23	-; 69
Trt-Eval Interval					0 DA-F	0 DA-G	7 DA-H	23 DA-I	
ARM Action Codes									TY2
Number of Decimals									1
5	60 kgN/ha			A	18,8a	23,8a	18,8a	7,5a	58,2a
	Goltix 70 WG	1	kg/ha	B					
	Boxer	0,5	L/ha	C					
	Boxer	0,5	L/ha	D					
	Fenix	0,1	L/ha	D					
	Boxer	0,5	L/ha	E					
	Boxer	0,5	L/ha	F					
	Fenix	0,2	L/ha	F					
6	60 kgN/ha			A	15,0a	21,3a	17,5a	5,0a	58,6a
	Goltix 70 WG	0,5	kg/ha	B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
7	60 kgN/ha			A	30,0a	28,8a	22,5a	5,0a	58,9a
	Goltix 70 WG	0,5	kg/ha	B					
	27 kgN/ha			B					
	Boxer	0,25	L/ha	C					
	Boxer	0,25	L/ha	D					
	Fenix	0,05	L/ha	D					
	20 kgN/ha			D					
	Boxer	0,25	L/ha	E					
	Boxer	0,25	L/ha	F					
	Fenix	0,1	L/ha	F					
	20 kgN/ha			F					
LSD P=.05					10,82	9,36	8,63	13,99	10,69
Standard Deviation					7,25	6,30	5,73	9,23	7,20
CV					39,44	28,92	30,53	158,16	12,61
Grand Mean					18,39	21,79	18,75	5,83	57,08
Levene's F					2,413	1,179	1,44	1,45	0,435
Rank X2					.	.	.	.	.
P(Rank X2)					.	.	.	.	.
Replicate F					1,419	0,510	0,720	0,033	0,673
Replicate Prob(F)					0,2717	0,6804	0,5552	0,9917	0,5798
Treatment F					6,600	10,020	2,136	1,253	0,321
Treatment Prob(F)					0,0010	0,0001	0,1171	0,3370	0,9173

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns: Average=2,3,4,5,1,16

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Crop Code	ALLXS
BBCH Scale	BVBT
Crop Name	Direct seeded onion
Description	
Rating Date	
Rating Type	
Rating Unit	number
Sample Size, Unit	2 m2
Number of Subsamples	1
Data Entry Date	12-09-2022
Days After First/Last Applic.	
Trt-Eval Interval	
ARM Action Codes	
Number of Decimals	

Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	24
1	Untreated Check				180,0a
	60 kgN/ha			A	
2	60 kgN/ha			A	152,8a
	Stomp CS	1,6	L/ha	B	
	Fenix	0,4	L/ha	B	
	Boxer	0,5	L/ha	C	
	Boxer	0,5	L/ha	D	
	Fenix	0,1	L/ha	D	
	Boxer	0,5	L/ha	E	
	Boxer	0,5	L/ha	F	
	Fenix	0,2	L/ha	F	
	Boxer	0,5	L/ha	G	
	Lentagran 45 WP	0,2	kg/ha	G	
	Fenix	0,3	L/ha	H	
	Lentagran 45 WP	0,5	kg/ha	H	
	Lentagran 45 WP	1	kg/ha	I	
3	60 kgN/ha			A	162,3a
	Stomp CS	0,8	L/ha	B	
	Fenix	0,2	L/ha	B	
	Boxer	0,25	L/ha	C	
	Boxer	0,25	L/ha	D	
	Fenix	0,05	L/ha	D	
	Boxer	0,25	L/ha	E	
	Boxer	0,25	L/ha	F	
	Fenix	0,1	L/ha	F	
	Boxer	0,25	L/ha	G	
	Lentagran 45 WP	0,1	kg/ha	G	
	Fenix	0,15	L/ha	H	
	Lentagran 45 WP	0,25	kg/ha	H	
	Lentagran 45 WP	0,5	kg/ha	I	
4	60 kgN/ha			A	175,8a
	Stomp CS	0,8	L/ha	B	
	Fenix	0,2	L/ha	B	
	27 kgN/ha			B	
	Boxer	0,25	L/ha	C	
	Boxer	0,25	L/ha	D	
	Fenix	0,05	L/ha	D	
	20 kgN/ha			D	
	Boxer	0,25	L/ha	E	
	Boxer	0,25	L/ha	F	
	Fenix	0,1	L/ha	F	
	20 kgN/ha			F	
	Boxer	0,25	L/ha	G	
	Lentagran 45 WP	0,1	kg/ha	G	
	Fenix	0,15	L/ha	H	
	Lentagran 45 WP	0,25	kg/ha	H	
	Lentagran 45 WP	0,5	kg/ha	I	

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Pest Type				
Pest Code				
Pest Scientific Name				
Pest Name				
Crop Code				ALLXS
BBCH Scale				BVBT
Crop Name				Direct seeded onion
Description				
Rating Date				
Rating Type				
Rating Unit				number
Sample Size, Unit				2 m2
Number of Subsamples				1
Data Entry Date				12-09-2022
Days After First/Last Applic.				
Trt-Eval Interval				
ARM Action Codes				
Number of Decimals				
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	24
5	60 kgN/ha			A	154,0a
	Goltix 70 WG	1	kg/ha	B	
	Boxer	0,5	L/ha	C	
	Boxer	0,5	L/ha	D	
	Fenix	0,1	L/ha	D	
	Boxer	0,5	L/ha	E	
	Boxer	0,5	L/ha	F	
	Fenix	0,2	L/ha	F	
6	60 kgN/ha			A	185,8a
	Goltix 70 WG	0,5	kg/ha	B	
	Boxer	0,25	L/ha	C	
	Boxer	0,25	L/ha	D	
	Fenix	0,05	L/ha	D	
	Boxer	0,25	L/ha	E	
	Boxer	0,25	L/ha	F	
	Fenix	0,1	L/ha	F	
7	60 kgN/ha			A	168,3a
	Goltix 70 WG	0,5	kg/ha	B	
	27 kgN/ha			B	
	Boxer	0,25	L/ha	C	
	Boxer	0,25	L/ha	D	
	Fenix	0,05	L/ha	D	
	20 kgN/ha			D	
	Boxer	0,25	L/ha	E	
	Boxer	0,25	L/ha	F	
	Fenix	0,1	L/ha	F	
	20 kgN/ha			F	
LSD P=.05					28,99
Standard Deviation					19,52
CV					11,59
Grand Mean					168,39
Levene's F					0,569
Rank X2					.
P(Rank X2)					.
Replicate F					0,124
Replicate Prob(F)					0,9446
Treatment F					1,715
Treatment Prob(F)					0,1748

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns: Average=2,3,4,5,1,16

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Flydende N markforsøg løg

Trial ID:22404 Location:Flakkebjerg Trial Year:2022
Protocol ID:22404 Investigator:Andrius Hansen Kemezys
Project ID:35420 Study Director:
Sponsor Contact:

Pest Type
W, Weed = Weed or volunteer crop
Pest Code
CHEAL, Chenopodium album, fat-hen = IE
POAAN, Poa annua, Annual bluegrass = IE
VIOAR, Viola arvensis, Field pansy = IE
BBBBB, Broad-leaved plants, Broad-leaved plants = IE
Crop Code
ALLXS, BVBT, Allium cepa (direct-seeded), Direct seeded onion = US
Rating Type
CONTRO = control / burndown or knockdown
PHYGEN = phytotoxicity - general / injury
YIELD = yield
Rating Unit
% = percent
T-MET = ton (metric=1000 kg)

ha = hectare
m2 = square meter
ARM Action Codes
TY2 = 5.0*[C22]

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Flydende N forsøg i gulerødder

Trial ID:22416 Location:Flakkebjerg Trial Year:2022
Protocol ID:22416 Investigator:Andrius Hansen Kemezys
Project ID:35420 Study Director:
Sponsor Contact:

General Trial Information

Investigator: Andrius Hansen Kemezys

Discipline: H herbicide
Trial Status: E established
ARM Trial Created On: 15-08-2022

Conducted Under GLP: No
Conducted Under GEP: No

Investigator: Andrius Hansen Kemezys

Site and Design

Treated Plot Width: 4 m
Treated Plot Length: 6 m
Treated Plot Area: 24 m2 **Treatments:** 7
Replications: 4 **Study Design:** RACOBL Randomized Complete Block (RCB)

Application Description

	B	C	D	E
Application Date:	07-06-2022	17-06-2022	24-06-2022	04-07-2022
Appl. Entry Date:	21-11-2022	21-11-2022	21-11-2022	21-11-2022

Crop Stage At Each Application

	B	C	D	E
Stage Majority, Percent:	07; -	11; -	13; -	14-15; -

Application Equipment

	A	B	C	D	E
Appl. Equipment:	bicyc.spraye	Selvkørende	Selvkørende	Selvkørende	Selvkørende
Equipment Type:	SPRBIC	SPRAYE	SPRAYE	SPRAYE	SPRAYE
Operation Pressure:		3.8 BAR	3.8 BAR	3.8 BAR	3.8 BAR
Nozzle Type:	Hardi	Hardi	Hardi	Hardi	Hardi
Nozzle Size:	LD015-110	LD015-110	LD015-110	LD015-110	LD015-110
Nozzle Spacing:		50 cm	50 cm	50 cm	50 cm
Nozzles/Row:	3	5	5	5	5
Boom Length:		2.5 m	25 m	25 m	25 m
Boom Height:		50 cm	50 cm	50 cm	50 cm
Ground Speed:		3.7 KPH	3.7 KPH	3.7 KPH	3.7 KPH
Carrier:		WATER	WATER	WATER	WATER
Spray Volume:		200 L/ha	200 L/ha	200 L/ha	200 L/ha

Date	By	Context	Notes
15-08-2022	Andrius Hansen Kemezys	STATUS	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
15-08-2022	Andrius Hansen Kemezys	STATUS	Automatically added by ARM: Trial Status changed to: E: changed by (XDAKEA).
15-08-2022	Andrius Hansen Kemezys	STATUS	Automatically added by ARM: Trial Status updated to 'E' when Rating Date entered.

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Flydende N forsøg i gulerødder

Trial ID:22416 Location:Flakkebjerg Trial Year:2022
Protocol ID:22416 Investigator:Andrius Hansen Kemezys
Project ID:35420 Study Director:
Sponsor Contact:

Pest Type				W; Weed	W; Weed	W; Weed	W; Weed	W; Weed
Pest Code				VIOAR	VIOAR	CHEAL	CHEAL	BBBBB
Pest Scientific Name				Viola arvensis	Viola arvensis	Chenopodium album	Chenopodium album	Broad-leaved plants
Pest Name				Field pansy	Field pansy	common lambsquarters	common lambsquarters	Broad-leaved plants
Crop Code				DAUCS	DAUCS	DAUCS	DAUCS	DAUCS
BBCH Scale				BVRT	BVRT	BVRT	BVRT	BVRT
Crop Name				Carrot	Carrot	Carrot	Carrot	Carrot
Rating Date				04-07-2022	24-06-2022	04-07-2022	24-06-2022	04-07-2022
Part Rated				PLANT; P	PLANT; P	PLANT; P	PLANT; P	PLANT; P
Rating Type				CONTRO	CONTRO	CONTRO	CONTRO	CONTRO
Rating Unit				%	%	%	%	%
Number of Subsamples				1	1	1	1	1
Data Entry Date				15-08-2022	16-08-2022	15-08-2022	16-08-2022	15-08-2022
Days After First/Last Applic.				-; 10	-; 7	-; 10	-; 7	-; 10
Trt-Eval Interval				27 DA-B	17 DA-B	27 DA-B	17 DA-B	27 DA-B
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	2	6	3	7	4
1	Untreated Check								
2	Granuleret N 120 kg/ha			A	100,0a	100,0a	99,0a	82,5a	98,0a
	DFF SC 500	0,15	L/ha	B					
	Fenix	0,3	L/ha	C					
	Fenix	0,5	L/ha	DE					
3	Granuleret N 120 kg/ha			A	100,0a	100,0a	81,3ab	68,8a	81,3abc
	DFF SC 500	0,075	L/ha	B					
	Fenix	0,15	L/ha	C					
	Fenix	0,25	L/ha	DE					
4	Granuleret N 60 kg/ha			A	100,0a	100,0a	80,0ab	72,5a	80,0abc
	Flydende N 30-2	101	L/ha	B					
	DFF SC 500	0,075	L/ha	B					
	Fenix	0,15	L/ha	C					
	Flydende N 30-2	25	L/ha	DE					
	Fenix	0,15	L/ha	DE					
5	Granuleret N 120 kg/ha			A	86,8b	78,0b	94,8a	80,0a	86,8ab
	Goltix WG	1	kg/ha	B					
	Fenix	0,3	L/ha	CDE					
	Centium 36 CS	0,08	L/ha	DE					
6	Granuleret N 120 kg/ha			A	73,8c	62,5c	71,3b	43,8a	65,0c
	Goltix WG	0,5	kg/ha	B					
	Fenix	0,15	L/ha	CDE					
	Centium 36 CS	0,04	L/ha	DE					
7	Granuleret N 60 kg/ha			A	82,5b	86,3ab	80,0ab	52,5a	75,0bc
	Goltix WG	0,5	kg/ha	B					
	Flydende N 30-2	101	L/ha	B					
	Fenix	0,15	L/ha	CDE					
	Centium 36 CS	0,04	L/ha	DE					
	Flydende N 30-2	25	L/ha	DE					
LSD P=.05					7,61	11,49	13,28	27,18	14,66
Standard Deviation					5,05	7,63	8,81	18,04	9,72
CV					5,58	8,69	10,45	27,05	12,01
Grand Mean					90,50	87,79	84,38	66,67	81,00
Levene's F					2,075	1,971	1,438	1,086	0,818
Rank X2					.	.	.	.	.
P(Rank X2)					.	.	.	.	.
Replicate F					2,588	0,570	0,709	3,775	0,525
Replicate Prob(F)					0,0915	0,6432	0,5617	0,0336	0,6716
Treatment F					19,745	16,303	5,581	2,933	5,204
Treatment Prob(F)					0,0001	0,0001	0,0042	0,0483	0,0057

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).
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Pest Type				W; Weed		
Pest Code				BBBBB		
Pest Scientific Name				Broad-leaved plants		
Pest Name				Broad-leaved plants		
Crop Code				DAUCS	DAUCS	DAUCS
BBCH Scale				BVRT	BVRT	BVRT
Crop Name				Carrot	Carrot	Carrot
Rating Date				24-06-2022	04-07-2022	24-06-2022
Part Rated				PLANT; P	PLANT; C	PLANT; C
Rating Type				CONTRO	PHYGEN	PHYGEN
Rating Unit				%	%	%
Number of Subsamples				1	1	1
Data Entry Date				16-08-2022	15-08-2022	16-08-2022
Days After First/Last Applic.				-; 7	-; 10	-; 7
Trt-Eval Interval				17 DA-B	27 DA-B	17 DA-B
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	8	1	5
1	Untreated Check						
2	Granuleret N 120 kg/ha			A	94,3a	25,0a	18,8a
	DFF SC 500	0,15	L/ha	B			
	Fenix	0,3	L/ha	C			
	Fenix	0,5	L/ha	DE			
3	Granuleret N 120 kg/ha			A	83,8a	13,8bc	12,5b
	DFF SC 500	0,075	L/ha	B			
	Fenix	0,15	L/ha	C			
	Fenix	0,25	L/ha	DE			
4	Granuleret N 60 kg/ha			A	82,5a	6,3cd	6,3c
	Flydende N 30-2	101	L/ha	B			
	DFF SC 500	0,075	L/ha	B			
	Fenix	0,15	L/ha	C			
	Flydende N 30-2	25	L/ha	DE			
	Fenix	0,15	L/ha	DE			
5	Granuleret N 120 kg/ha			A	72,5ab	20,0ab	3,8c
	Goltix WG	1	kg/ha	B			
	Fenix	0,3	L/ha	CDE			
	Centium 36 CS	0,08	L/ha	DE			
6	Granuleret N 120 kg/ha			A	50,0c	1,3d	0,0c
	Goltix WG	0,5	kg/ha	B			
	Fenix	0,15	L/ha	CDE			
	Centium 36 CS	0,04	L/ha	DE			
7	Granuleret N 60 kg/ha			A	60,0bc	8,8cd	1,3c
	Goltix WG	0,5	kg/ha	B			
	Flydende N 30-2	101	L/ha	B			
	Fenix	0,15	L/ha	CDE			
	Centium 36 CS	0,04	L/ha	DE			
	Flydende N 30-2	25	L/ha	DE			
LSD P=.05					16,32	7,10	5,67
Standard Deviation					10,83	4,71	3,76
CV					14,67	37,71	53,14
Grand Mean					73,83	12,50	7,08
Levene's F					2,378	1,933	0,943
Rank X2					.	.	.
P(Rank X2)					.	.	.
Replicate F					1,382	2,125	2,059
Replicate Prob(F)					0,2865	0,1399	0,1488
Treatment F					9,219	14,175	14,765
Treatment Prob(F)					0,0004	0,0001	0,0001

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.

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Flydende N forsøg i gulerødder

Trial ID:22416 Location:Flakkebjerg Trial Year:2022
Protocol ID:22416 Investigator:Andrius Hansen Kemezys
Project ID:35420 Study Director:
Sponsor Contact:

Pest Type
W, Weed = Weed or volunteer crop
Pest Code
VIOAR, Viola arvensis, Field pansy = IE
CHEAL, Chenopodium album, common lambsquarters = IE
BBBBB, Broad-leaved plants, Broad-leaved plants = IE
Crop Code
DAUCS, BVRT, Daucus carota subsp. sativus, Carrot = IE
Part Rated
PLANT = plant
P = Pest is Part Rated
C = Crop is Part Rated
Rating Type
CONTRO = control / burndown or knockdown
PHYGEN = phytotoxicity - general / injury
Rating Unit
% = percent

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Trial ID:22478 Location: Trial Year:2022
Protocol ID: Investigator:Andrius Hansen Kemezys
Project ID: Study Director:
Sponsor Contact:

Trial Status:E established
ARM Trial Created On:05-08-2022

Conducted Under GLP: No
Conducted Under GEP: No

Site and Design

Treated Plot Width:4 m
Treated Plot Length:6 m
Treated Plot Area:24 m2 **Treatments:**7
Replications:4 **Study Design:**RACOBL Randomized Complete Block (RCB)

Application Description

	A	B	C
Application Date:	10-06-2022	23-06-2022	08-07-2022
Appl. Start Time:		10:40	08:20
Appl. Stop Time:		11:20	08:45
Appl. Entry Date:	05-08-2022	05-08-2022	05-08-2022
Air Temperature Start, Stop:	-; 24,2 C	-; 19,7 C	-; 15,2 C
% Relative Humidity Start, Stop:	-; 43,7	-; 64	-; 76,4
Wind Velocity+Dir., Start:	- MPS; -	- MPS; -	- MPS; -
Wind Velocity+Dir., Stop:	1,2; MPS; -	1,3; MPS; -	3,6; MPS; NW
Wet Leaves (Y/N):	N; no	N; no	N; no
Soil Temperature, Unit:	21,7 C	19,5 C	16,4 C
% Cloud Cover:		5	

Crop Stage At Each Application

	B	C
Stage Majority, Percent:	61; -	65; -

Date	By	Context	Notes
05-08-2022	Andrius Hansen Kemezys	STATUS	Automatically added by ARM: Trial Status updated to 'S' during trial creation.
05-08-2022	Andrius Hansen Kemezys	STATUS	Automatically added by ARM: Trial Status changed to: E: changed by (XDAKEA).
05-08-2022	Andrius Hansen Kemezys	STATUS	Automatically added by ARM: Trial Status updated to 'E' when Application Date entered.

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Trial ID:22478 Location: Trial Year:2022
Protocol ID: Investigator:Andrius Hansen Kemezys
Project ID: Study Director:
Sponsor Contact:

Pest Type				W; Weed	W; Weed	W; Weed	W; Weed	W; Weed	W; Weed
Pest Code				THLAR	THLAR	THLAR	URTUR	URTUR	URTUR
Pest Scientific Name				Thlaspi arvense	Thlaspi arvense	Thlaspi arvense	Urtica urens	Urtica urens	Urtica urens
Pest Name				Field pennycress	Field pennycress	Field pennycress	Small nettle	Small nettle	Small nettle
Crop Code				FRAAN	FRAAN	FRAAN	FRAAN	FRAAN	FRAAN
BBCH Scale				BSTR	BSTR	BSTR	BSTR	BSTR	BSTR
Crop Name				strawberry	strawberry	strawberry	strawberry	strawberry	strawberry
Rating Date				23-06-2022	29-06-2022	18-07-2022	23-06-2022	29-06-2022	18-07-2022
Part Rated				PLANT; P	PLANT; P	PLANT; P	PLANT; P	PLANT; P	PLANT; P
Rating Type				CONTRO	CONTRO	CONTRO	PHYGEN	PHYGEN	PHYGEN
Rating Unit				%	%	%	%	%	%
Number of Subsamples				1	1	1	1	1	1
Pest Stage Majority				61	65	69	33	55	65
Pest Density, Unit				4,5 PLA/m2	5 PLA/m2	5 PLA/m2	7,75 PLA/m2	10 PLA/m2	10 PLA/m2
Assessed By				AHK	AHK	AHK	AHK	AHK	AHK
Data Entry Date				05-08-2022	05-08-2022	05-08-2022	05-08-2022	05-08-2022	05-08-2022
Days After First/Last Applic.				13; 13	19; 6	38; 10	13; 13	19; 6	38; 10
Trt-Eval Interval				13 DA-A	6 DA-B	10 DA-C	13 DA-A	6 DA-B	10 DA-C
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	1	5	9	2	6	10
1	Untreated Check									
2	Stomp CS	1,6	L/ha	A	93,8a	98,5a	97,5a	92,5a	99,5a	100,0a
	Boxer	1,5	L/ha	A						
	Boxer	1,5	L/ha	BC						
	Goltix WG	0,7	kg/ha	BC						
3	Stomp CS	0,8	L/ha	A	76,3b	88,8b	67,5b	70,0a	86,0b	81,3b
	Boxer	0,75	L/ha	A						
	Boxer	0,75	L/ha	BC						
	Goltix WG	0,35	kg/ha	BC						
4	Stomp CS	0,8	L/ha	A	98,0a	99,8a	96,7a	85,0a	96,8a	94,0ab
	Boxer	0,75	L/ha	A						
	NS 30-2 Flydende N, 40 kg/ha			A						
	Boxer	0,75	L/ha	BC						
	Goltix WG	0,35	kg/ha	BC						
	NS 30-2 Flydende N, 20 kg/ha			BC						
5	Goltix WG	1	kg/ha	A	81,3ab	99,3a	100,0a	82,5a	99,5a	97,3a
	Betanal	2	L/ha	BC						
	Boxer	2	L/ha	BC						
6	Goltix WG	0,5	kg/ha	A	68,8b	95,0ab	94,3a	70,0a	96,3a	86,8ab
	Betanal	1	L/ha	BC						
	Boxer	1	L/ha	BC						
7	Goltix WG	0,5	kg/ha	A	97,3a	100,0a	100,0a	93,8a	98,3a	93,3ab
	NS 30-2 Flydende N, 40 kg/ha			A						
	Betanal	1	L/ha	BC						
	Boxer	1	L/ha	BC						
	NS 30-2 Flydende N, 20 kg/ha			BC						
LSD P=.05					14,32	7,26	16,48	19,16	7,73	10,30
Standard Deviation					9,50	4,82	10,79	12,71	5,13	6,75
CV					11,06	4,97	11,64	15,45	5,34	7,32
Grand Mean					85,88	96,88	92,65	82,29	96,04	92,10
Levene's F					5,888*	9,252*	8,384*	3,008*	58,615*	6,205*
Rank X2					.	.	.	.	.	.
P(Rank X2)					.	.	.	.	.	.
Replicate F					2,438	1,855	0,460	2,465	1,721	1,636
Replicate Prob(F)					0,1048	0,1807	0,7150	0,1023	0,2055	0,2294
Treatment F					6,611	3,304	5,381	2,698	3,960	4,226
Treatment Prob(F)					0,0019	0,0329	0,0067	0,0622	0,0173	0,0168

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns: Average=9,10,11,12

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Pest Type				W; Weed	W; Weed	W; Weed			
Pest Code				BBBBB	BBBBB	BBBBB			
Pest Scientific Name				Broad-leaved plants	Broad-leaved plants	Broad-leaved plants			
Pest Name				Broad-leaved plants	Broad-leaved plants	Broad-leaved plants			
Crop Code				FRAAN	FRAAN	FRAAN	FRAAN	FRAAN	FRAAN
BBCH Scale				BSTR	BSTR	BSTR	BSTR	BSTR	BSTR
Crop Name				strawberry	strawberry	strawberry	strawberry	strawberry	strawberry
Rating Date				23-06-2022	29-06-2022	18-07-2022	23-06-2022	29-06-2022	18-07-2022
Part Rated				PLANT; P	PLANT; P	PLANT; P	PLANT; C	PLANT; C	PLANT; C
Rating Type				CONTRO	CONTRO	CONTRO	PHYGEN	PHYGEN	PHYGEN
Rating Unit				%	%	%	%	%	%
Number of Subsamples				1	1	1	1	1	1
Pest Stage Majority									
Pest Density, Unit				4,75 PLA/m2	5,75 PLA/m2	7,75 PLA/m2			
Assessed By				AHK	AHK	AHK	AHK	AHK	AHK
Data Entry Date				05-08-2022	05-08-2022	05-08-2022	05-08-2022	05-08-2022	05-08-2022
Days After First/Last Applic.				13; 13	19; 6	38; 10	13; 13	19; 6	38; 10
Trt-Eval Interval				13 DA-A	6 DA-B	10 DA-C	13 DA-A	6 DA-B	10 DA-C
Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	3	7	11	4	8	12
1	Untreated Check							0,0b	0,0b	0,0c
2	Stomp CS	1,6	L/ha	A	86,3a	95,0a	94,3a	16,3a	28,8a	31,3a
	Boxer	1,5	L/ha	A						
	Boxer	1,5	L/ha	BC						
	Goltix WG	0,7	kg/ha	BC						
3	Stomp CS	0,8	L/ha	A	67,5a	81,3b	77,5a	0,0b	7,5b	11,3b
	Boxer	0,75	L/ha	A						
	Boxer	0,75	L/ha	BC						
	Goltix WG	0,35	kg/ha	BC						
4	Stomp CS	0,8	L/ha	A	81,3a	93,8a	86,7a	20,0a	25,0a	33,3a
	Boxer	0,75	L/ha	A						
	NS 30-2 Flydende N, 40 kg/ha			A						
	Boxer	0,75	L/ha	BC						
	Goltix WG	0,35	kg/ha	BC						
	NS 30-2 Flydende N, 20 kg/ha			BC						
5	Goltix WG	1	kg/ha	A	61,3a	96,3a	91,3a	5,0b	7,5b	11,3b
	Betanal	2	L/ha	BC						
	Boxer	2	L/ha	BC						
6	Goltix WG	0,5	kg/ha	A	52,5a	89,3ab	80,0a	3,8b	5,0b	10,0b
	Betanal	1	L/ha	BC						
	Boxer	1	L/ha	BC						
7	Goltix WG	0,5	kg/ha	A	68,8a	90,0ab	88,3a	20,0a	26,3a	30,0a
	NS 30-2 Flydende N, 40 kg/ha			A						
	Betanal	1	L/ha	BC						
	Boxer	1	L/ha	BC						
	NS 30-2 Flydende N, 20 kg/ha			BC						
LSD P=.05					23,44	8,70	13,03	5,63	7,44	5,25
Standard Deviation					15,55	5,77	8,53	3,79	5,01	3,50
CV					22,35	6,35	9,88	40,84	35,07	19,3
Grand Mean					69,58	90,92	86,33	9,29	14,29	18,15
Levene's F					3,366*	0,679	2,02	1,643	0,636	0,63
Rank X2					.	.	.	.	.	.
P(Rank X2)					.	.	.	.	.	.
Replicate F					1,165	2,168	0,495	2,979	17,075	12,937
Replicate Prob(F)					0,3557	0,1344	0,6921	0,0589	0,0001	0,0002
Treatment F					2,580	3,604	2,299	23,152	22,565	56,129
Treatment Prob(F)					0,0709	0,0243	0,1052	0,0001	0,0001	0,0001

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns: Average=9,10,11,12

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Trt No.	Treatment Name	Rate	Rate Unit	Appl Code	13
	Pest Type				
	Pest Code				
	Pest Scientific Name				
	Pest Name				
	Crop Code				
	BBCH Scale				
	Crop Name				
	Rating Date				02-09-2022
	Part Rated				PLANT; C
	Rating Type				VIGOR
	Rating Unit				%
	Number of Subsamples				1
	Pest Stage Majority				
	Pest Density, Unit				
	Assessed By				
	Data Entry Date				07-09-2022
	Days After First/Last Applic.				84; 56
	Trt-Eval Interval				
1	Untreated Check				88,0b
2	Stomp CS	1,6	L/ha	A	94,5ab
	Boxer	1,5	L/ha	A	
	Boxer	1,5	L/ha	BC	
	Goltix WG	0,7	kg/ha	BC	
3	Stomp CS	0,8	L/ha	A	98,3a
	Boxer	0,75	L/ha	A	
	Boxer	0,75	L/ha	BC	
	Goltix WG	0,35	kg/ha	BC	
4	Stomp CS	0,8	L/ha	A	94,3ab
	Boxer	0,75	L/ha	A	
	NS 30-2 Flydende N, 40 kg/ha			A	
	Boxer	0,75	L/ha	BC	
	Goltix WG	0,35	kg/ha	BC	
	NS 30-2 Flydende N, 20 kg/ha			BC	
5	Goltix WG	1	kg/ha	A	98,8a
	Betanal	2	L/ha	BC	
	Boxer	2	L/ha	BC	
6	Goltix WG	0,5	kg/ha	A	98,8a
	Betanal	1	L/ha	BC	
	Boxer	1	L/ha	BC	
7	Goltix WG	0,5	kg/ha	A	95,0ab
	NS 30-2 Flydende N, 40 kg/ha			A	
	Betanal	1	L/ha	BC	
	Boxer	1	L/ha	BC	
	NS 30-2 Flydende N, 20 kg/ha			BC	
	LSD P=.05				5,44
	Standard Deviation				3,66
	CV				3,84
	Grand Mean				95,36
	Levene's F				1,281
	Rank X2				.
	P(Rank X2)				.
	Replicate F				0,772
	Replicate Prob(F)				0,5248
	Treatment F				4,362
	Treatment Prob(F)				0,0069

Means followed by same letter or symbol do not significantly differ (P=.05, Student-Newman-Keuls).
Mean comparisons performed only when AOV Treatment P(F) is significant at mean comparison OSL.
Missing data estimates are included in columns: Average=9,10,11,12

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Trial ID:22478 Location: Trial Year:2022
Protocol ID: Investigator:Andrius Hansen Kemezys
Project ID: Study Director:
Sponsor Contact:

Pest Type
W, Weed = Weed or volunteer crop
Pest Code
THLAR, Thlaspi arvense, Field pennycress = IE
URTUR, Urtica urens, Small nettle = IE
BBBBB, Broad-leaved plants, Broad-leaved plants = IE
Crop Code
FRAAN, BSTR, Fragaria x ananassa, strawberry = US
Part Rated
PLANT = plant
P = Pest is Part Rated
C = Crop is Part Rated
Rating Type
CONTRO = control / burndown or knockdown
PHYGEN = phytotoxicity - general / injury
VIGOR = vigor
Rating Unit
% = percent
Pest Stage Majority
61 = Beginning of flowering: 10% of flowers open
65 = Full flowering: 50% of flowers open, first petals may be fallen
69 = End of flowering: fruit set visible
33 = 3 visibly extended internode; G_3 node stage
55 = First individual flowers visible (still closed); G_Half of inflorescence emerged (middle of heading)

PLA/m2 = plants per square meter
Assessed By
AHK = Andrius Hansen Kemezys

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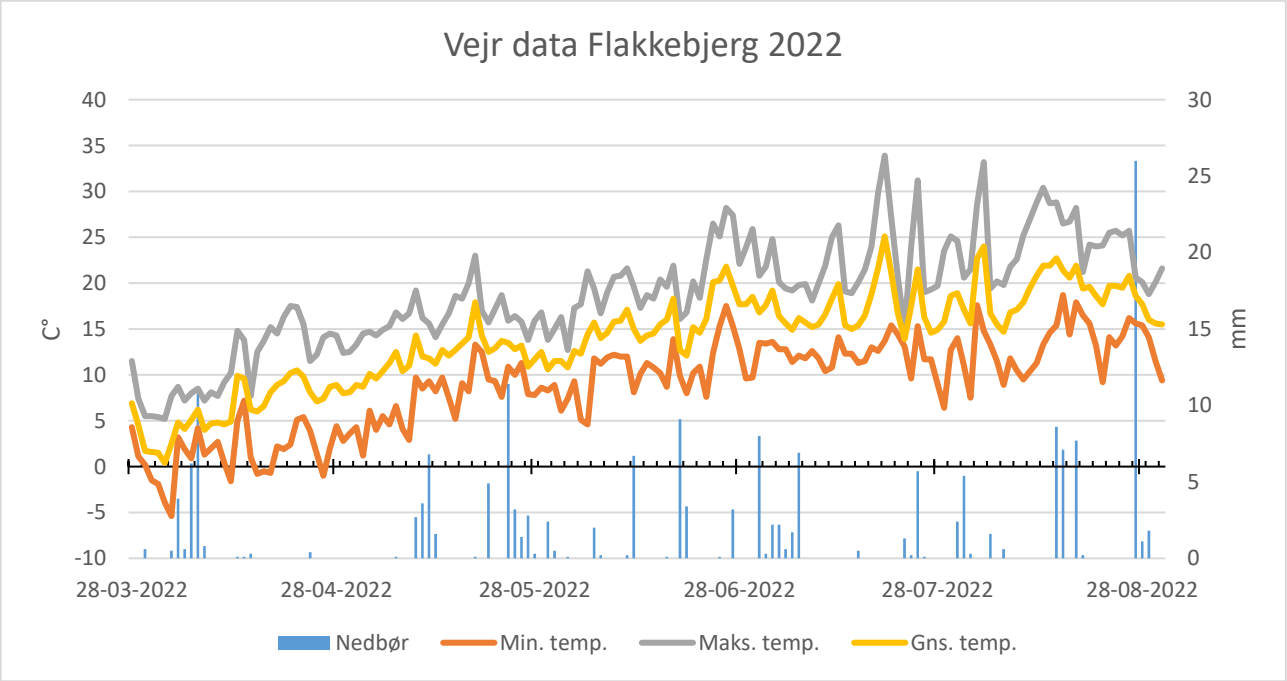
Appendix 1. Weather data Flakkebjerg.

Figure 1. Average (TEMP), Minimum (MINTE) and maximum (MAXTE) temperature and precipitation (PREC).



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Appendix 2. Flakkebjerg scale for phytotoxicity assessment

Rating	"Flakkebjerg rating of herbicide injury in minor crops"
0	No injury
10	Least significant injury of herbicide
20	Clear injury of herbicide, but probably acceptable without affecting yield
30	Very clear injury of herbicide. Will probably affect the yield
40	Very clear injury of herbicide. Will for sure affect the yield
50	
60	
70	
80	
90	
100	All crop killed

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