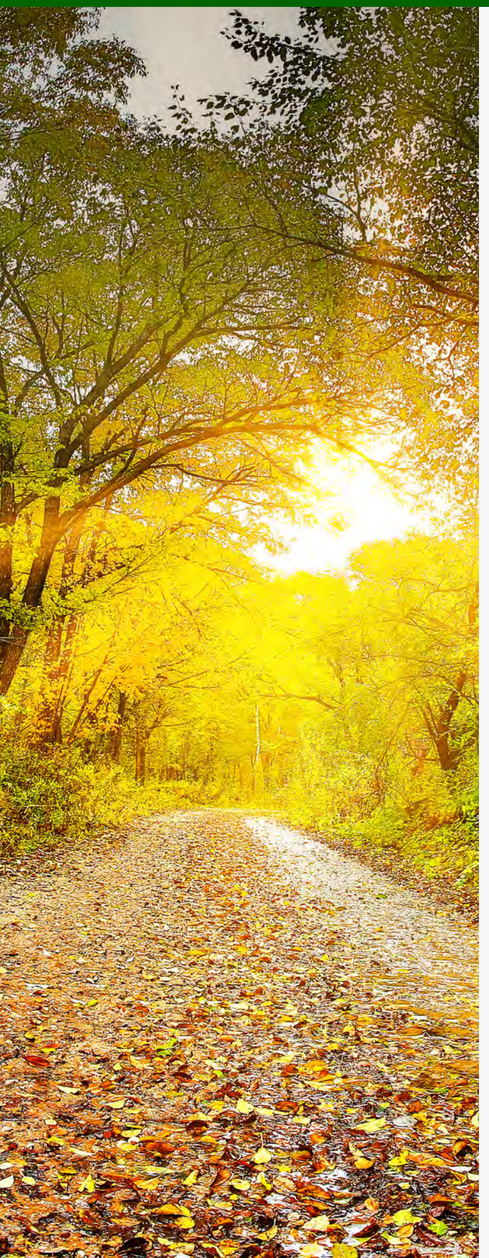
SG Crop Solutions

Herbicides Treatment: More Effective And Less Damage to Crops

SG Crop Solutions

07/2022

Overview



- ComCat O and AnnGro applied with herbicides reduce negative effect of herbicides on plants & turf, while improving the efficacy of herbicides.

- Many herbicides are very destructive to soil microbes and organic matters. Adding ComCat to herbicide applications will not only increase the efficacy of herbicides, reduce damage, but also enhance microbial activities and enrich the soil.

LETTUCE

CABBAGE

CAULIFLOWER

TOMATO

ComCat O is a bio-extract derived from wild plant which promotes root growth and seed germination.

- Easy to use, can be mixed with modern fertilizers, fungicides, and insecticides
- Suitable for most plants and safe for human, certified organic in California
- Successful for many years around the world in agriculture and professional turf

Mode of Action

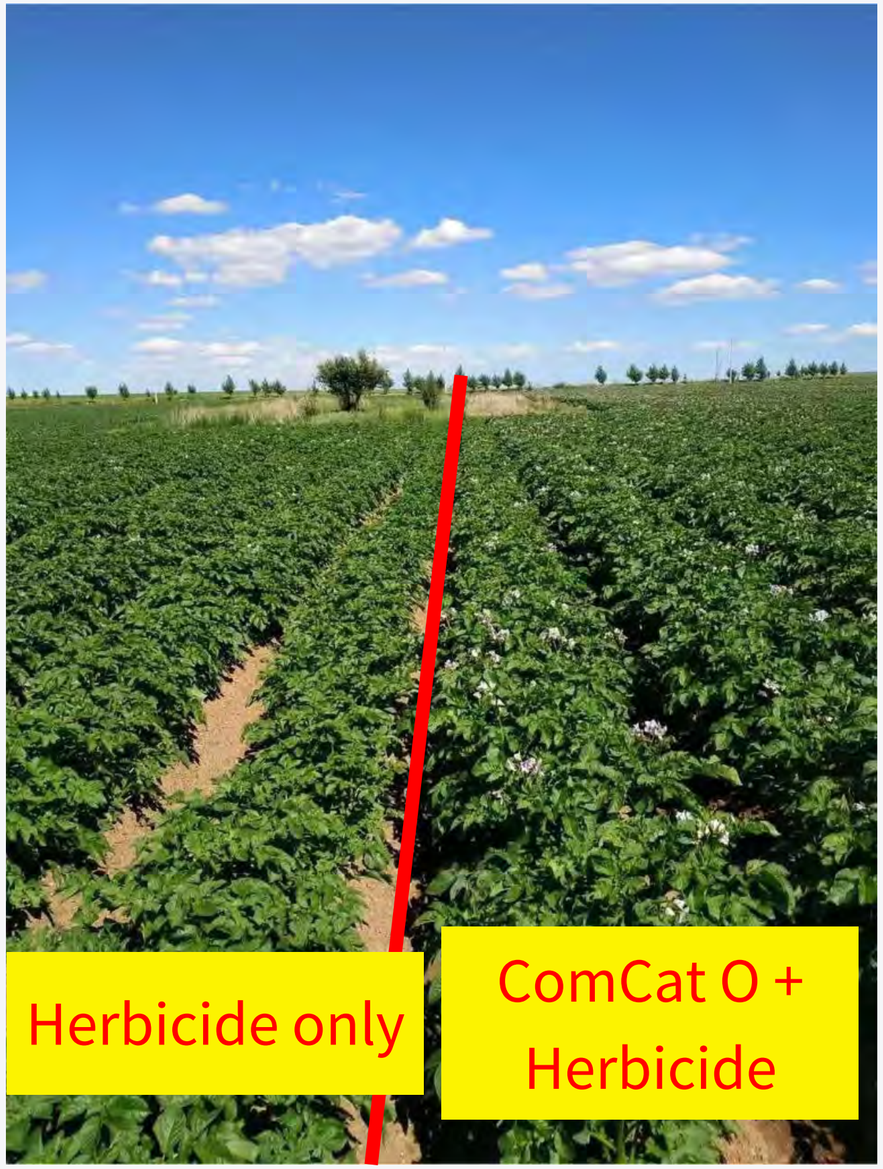
1. Apply Signaling Molecule (Activator) ComCat O

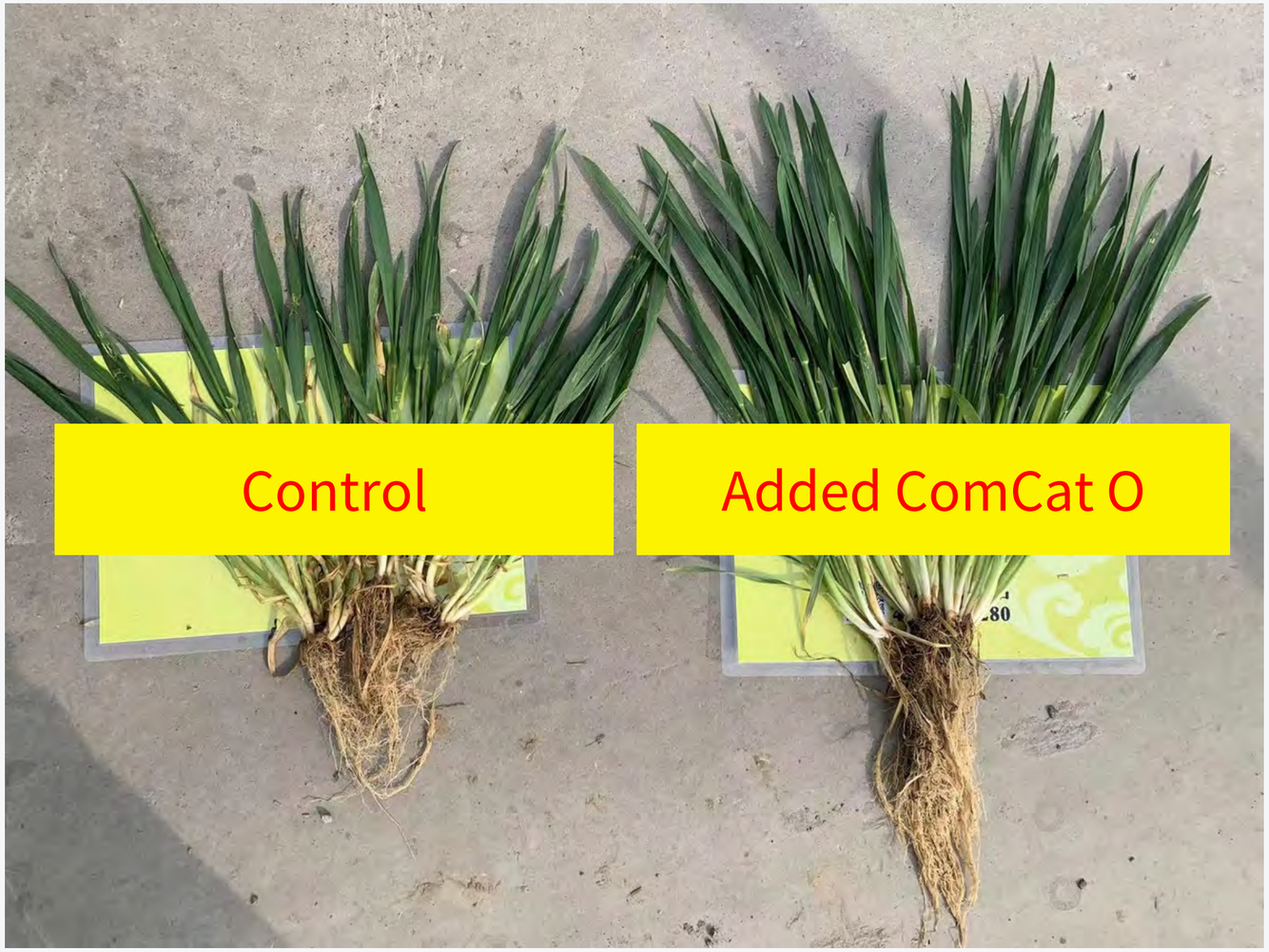
2. Gene Expression
The memory of the cells carry the architect's plan for the suitable chemical reaction to fight towards stress situation

4. Systemic Acquired Resistance:
The plant is now able to fight against stress factors by means of **Systemic Acquired Resistance**

3. Proteins / Physical protection via certain substances
After the first application the plants produce defense PR proteins and lignin/ Callose for resistance

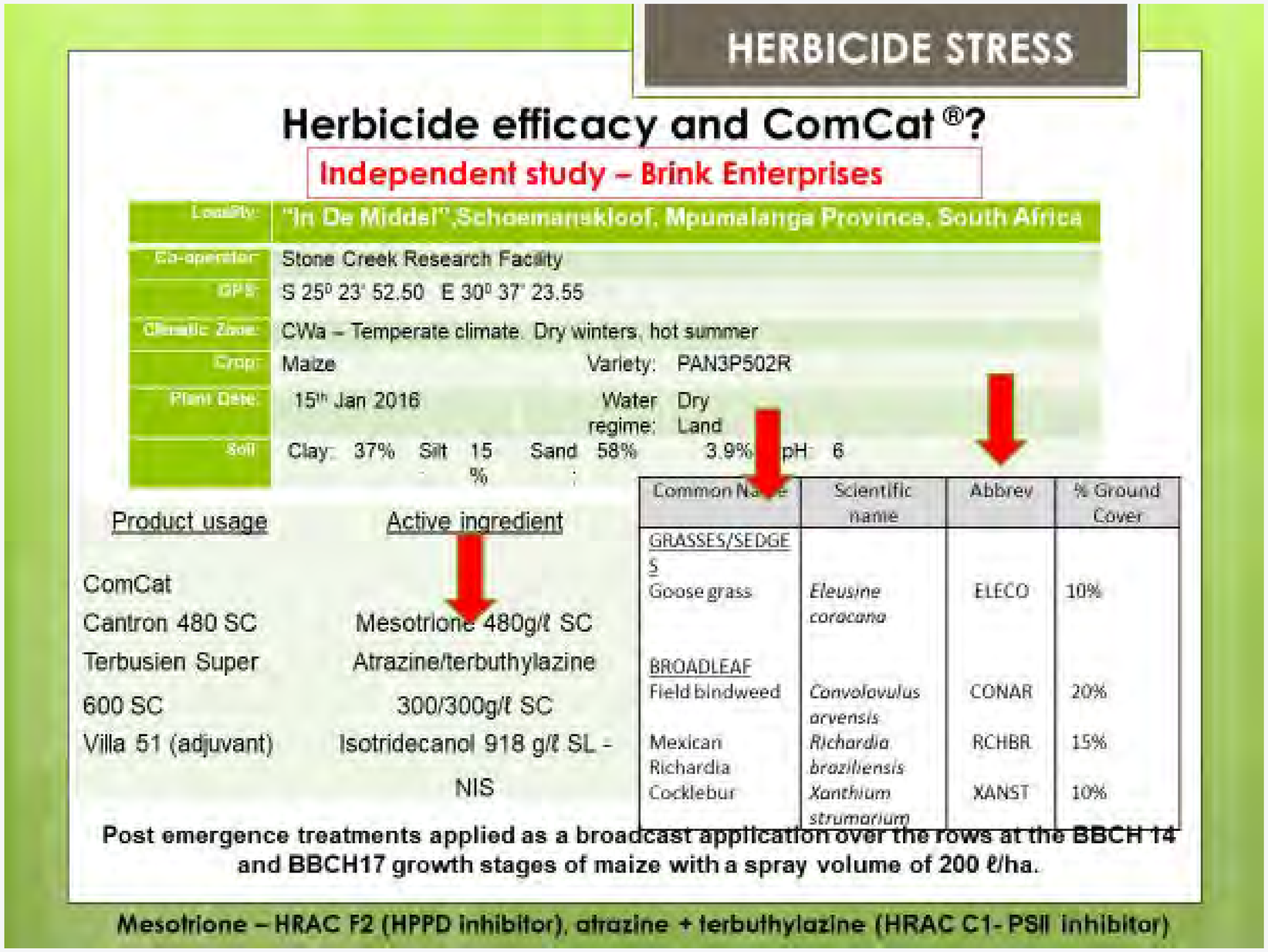
Grower Field Trials





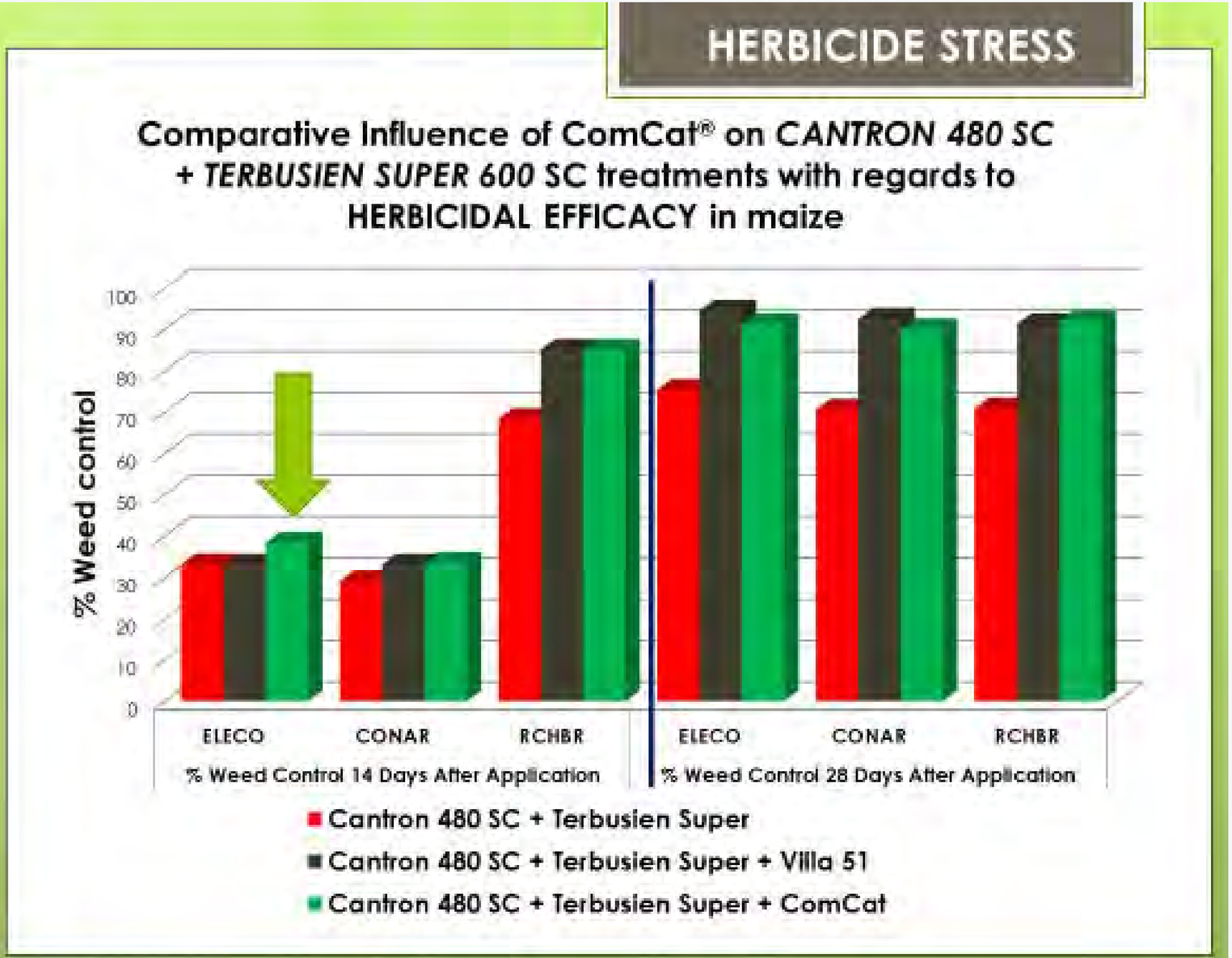
Stronger roots, greener and thicker leaves

Will ComCat O stimulate weed growth?



Testing herbicide efficacy with ComCat O.

Will ComCat O stimulate weed growth?

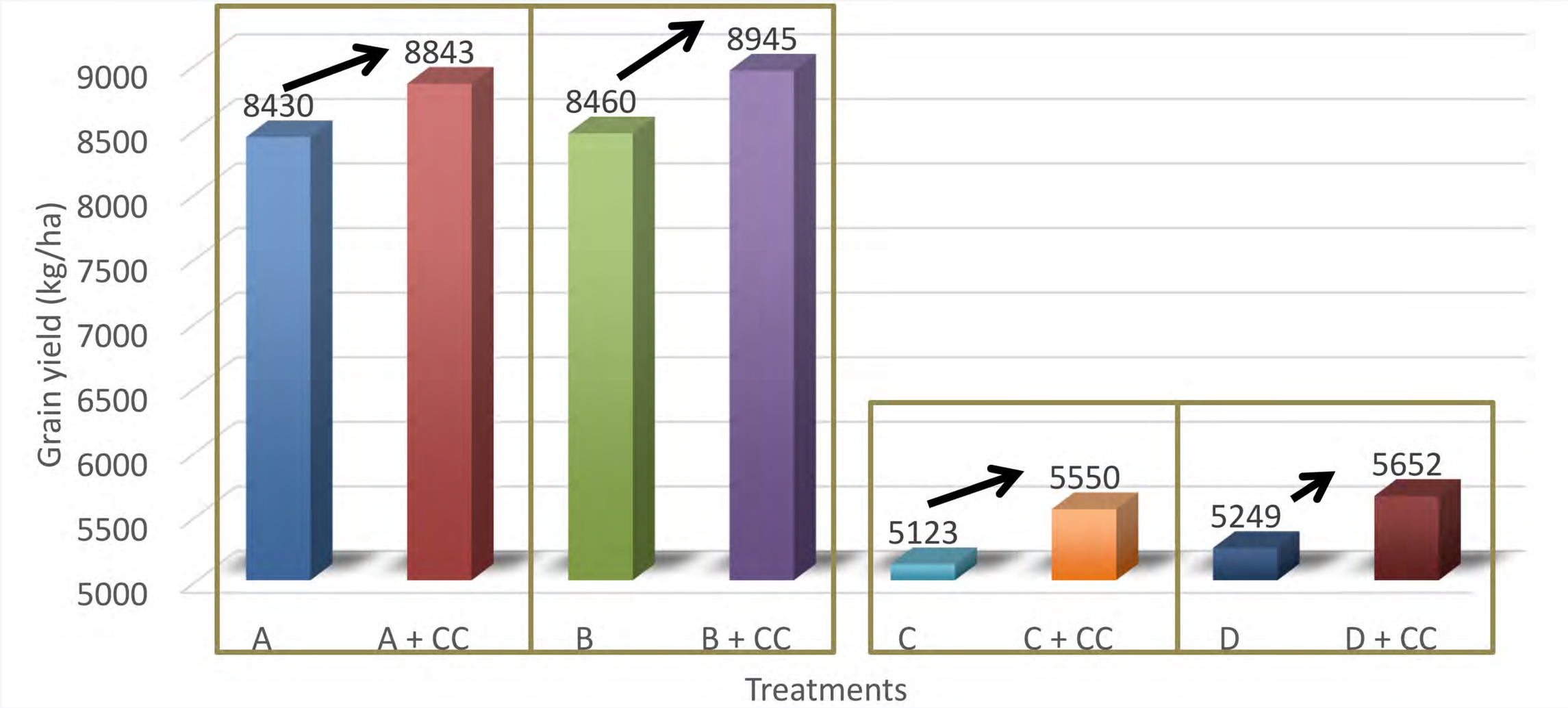


The result showed that adding ComCat O didn't stimulate further weed growth compared to the control. A possible explanation is that the stimulation of vegetative growth in weeds, leading to active dividing meristematic tissues, sensitizes the weeds to herbicide attack rather than the opposite. It is known that herbicides work best on actively growing weeds.

Will ComCat O applied together with herbicides still have an influence on yield?

- Herbicide can remain in soil as residuals for a period of time.
- Several herbicides can be excessively persistent even when used at label-approved rates. Atrazine, Diphenamid, Metribuzin, Glyphosate and Trifluralin are examples of chemicals which have a long residual effect and may affect susceptible crops grown later in the rotation.
- **ComCat® is known to promote yield in a variety of row, vegetable and fruit crops. The question that must be answered is whether it can maintain this attribute when applied together with herbicides: Glyphosate, Acetochlor + Atrazine +Terbuthylazine.**

ComCat O - Herbicide stress reduction effects on maize



CC = ComCat O

- A/C/D: **Acetochlor** (HRAC K3 growth inhibitor) + **Atrazine** +**Terbuthylazine** (HRAC C1 PSII inhibitor).
- B: **Glyphosate**: HRAC G9 (EPSP synthase inhibitor).

Will ComCat O applied together with herbicides still have an influence on yield?

The yield response of maize after herbicide treatment in the absence (control) and presence of ComCat® in two separate trials under rainfed conditions. Post-emergence herbicide treatment was applied at the 10-leave stage. The postulate at the onset of these test-checks was that the attributes of ComCat might contribute to protection of the maize crop and prevent yield loss that is often experienced by farmers when post-emergence herbicides are foliar applied broadcast. **Surprisingly, the addition of ComCat to three different herbicides increased the maize yield significantly (Figure in previous page).**

A second study was undertaken to verify these results.

Effect of ComCat applied together with Florpyrauxifen-benzyl EC on the yield characteristics of rice.

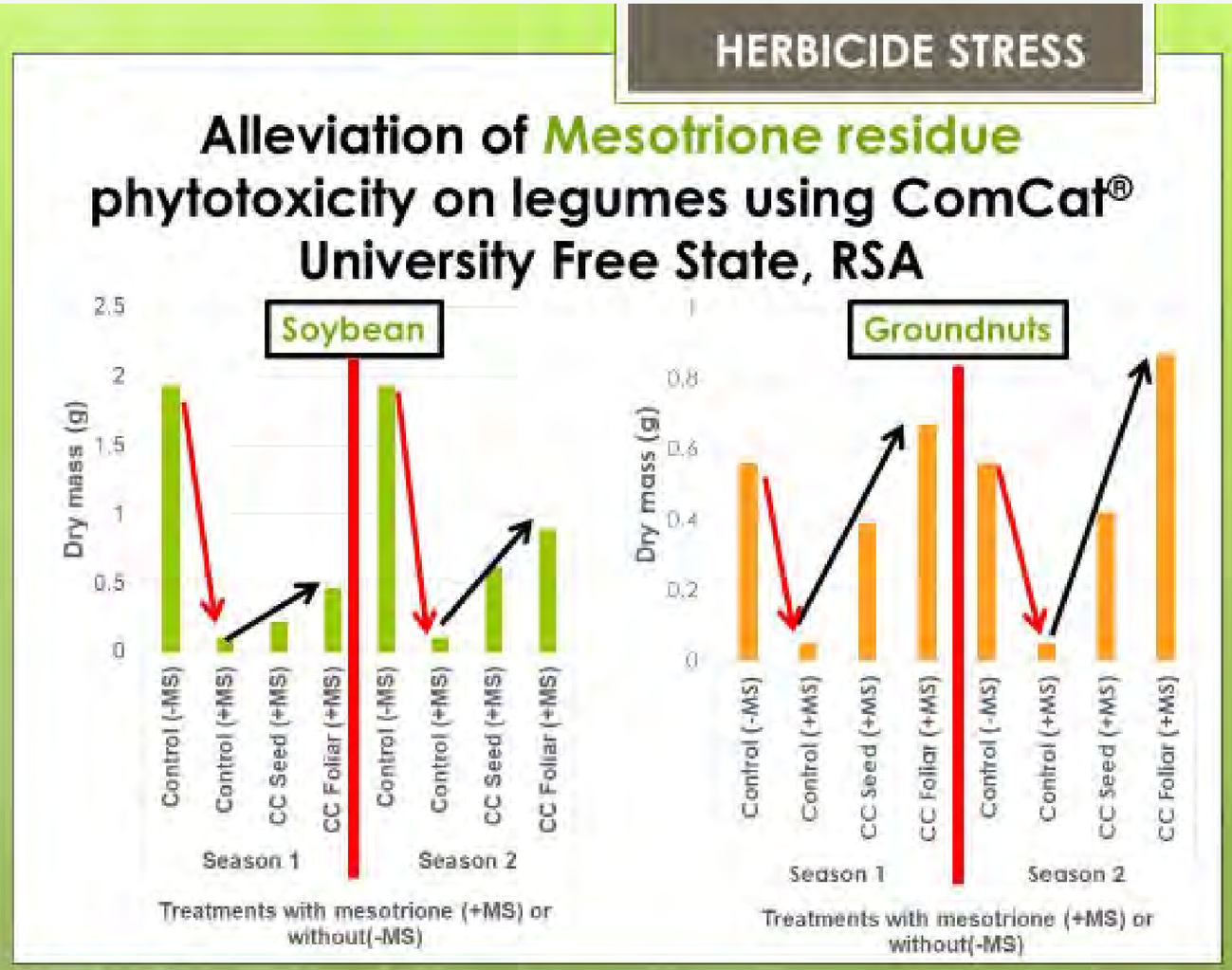
Treatments	height（cm）	flag leaf area（cm^2）	tiller number	panicle length（cm）	number of full grains per panicle	seed setting rate（%）	thousand grain weight（g）	grain weight per plant（g）	theoretical yield（kg/mu）
Control	127.87±1.46b	58.52±1.2b	8.89±0.38c	23.32±1.08b	110.33±18.03b	82.69±5.19b	30.74±0.95b	45.09±	1002.94±40.86b
VitaCat	147.13±1.35a	67.97±2.74a	12.22±0.77a	28.27±1.47a	128.56±8.18a	87.15±1.76a	33.39±1.68a	48.2±1.81a	1185.53±40.23a
3% Florpyrauxifen-benzyl EC	127.37±3.94b	57.9±6.57b	9.33±1.53bc	22.41±2.18b	97.67±7.23b	77.14±2.44b	28.13±1.67c	44.53±	973.98±100.2b
3% Florpyrauxifen-benzyl EC + VitaCat	131.63±4.71b	65.74±4.44ab	11.22±1.35ab	24.9±1.45b	115.78±7.37a	84.27±1.84a	32.02±0.6ab	49.64±3.97a	1184.08±83.1a

Note: Significance of difference between different lowercase letters at 0.05 level.

Effects on yield characteristics of rice treated with 3% Florpyrauxifen-benzyl EC （1200 mL/ha）± VitaCat （45 g/ha）

In the absence of ComCat the herbicide had a decreasing effect on rice yield, but in its presence yield loss was prevented.

Another Field Trial: ComCat O + Herbicides = Higher Yield in Legumes



Seed = seed treatment, Foliar = foliar spray

- ComCat O: seedling growth of soybean and groundnuts in soil containing Mesotrione residues over 2 seasons.
- Mesotrione residues in the soil significantly inhibited dry matter accumulation in seedlings while both seed treatment and foliar application with ComCat O tended to restore dry matter accumulation in both test crops.

Another Field Trial: ComCat O + Herbicides = Better Wheat Growth

HERBICIDE STRESS

Results-Wheat-Pyroxsulam-Isoproturon-ComCat®

18d after treatment

Treatments:

1. Control
2. 7.5% Pyroxsulam 20ml/mu+ 50% Isoproturon 250g/mu
3. 7.5% Pyroxsulam 20ml/mu+ 50% Isoproturon 250g/mu+ AnnGro
4. 7.5% Pyroxsulam 20ml/mu+ 50% Isoproturon 250g/mu + ComCat

More studies on herbicide stress and ComCat® planned!

ALS inhibitor (HRAC B2)

HERBICIDE STRESS

Results-Wheat-Pyroxsulam-Isoproturon-ComCat®

Quantification of data 18d after treatment application

Treatment	Dosage (g or ml/mu)	Plant height (cm)	Stem diameter (mm)	
Control	——	38 b	2.765 c	Weed Pressure!
7.5% Pyroxsulam + 50% Isoproturon	20mL/mu+250g/mu	46.5 b	3.4625 bc	
7.5% Pyroxsulam + 50% Isoproturon +AnnGro	20mL/mu+250g/mu	48.25 b	4.0625 b	
7.5% Pyroxsulam + 50% Isoproturon + ComCat	20mL/mu+250g/mu 100 g /ha	54.5 a	5.4525 a	

Dr. Rasine Zhang

Academic Journal 2022 - Weed Control and Rice Yield

Effects of GA·IAA·BR 0.136% wettable powder mixed with penoxsulam on the growth of *Echinochloa crus-galli* var. *mitis* and *Oryza sativa*

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Abstract *Echinochloa crus-galli* var. *mitis* and *Oryza sativa* were used to investigate whether the tank-mixed application of GA·IAA·BR 0.136% WP and penoxsulam 25 g/L OD in paddy fields affected the growth of rice and enhanced the control efficacy against barnyardgrass in this study. The experiments included four treatments: negative control (water), GA·IAA·BR 0.136% WP, penoxsulam 25 g/L OD, and GA·IAA·BR 0.136% WP+ penoxsulam 25 g/L OD. The indices related to the growth of barnyardgrass and rice after treatment, acetolactate synthase (ALS) activity, chlorophyll fluorescence parameters, glucose metabolism and nitrogen metabolism were studied. The results showed that, compared with penoxsulam 25 g/L OD treatment, tank-mixed GA·IAA·BR 0.136% WP with penoxsulam 25 g/L OD significantly increased the comprehensive index of herbicide injury by 13.2% and significantly decreased ALS activity (by 27.61%), the chlorophyll fluorescence parameters (Fv/Fm, ETR, qP), glucose metabolism and nitrogen metabolism in the barnyardgrass on day seven after treatment. The ALS activity, glucose and nitrogen metabolism were significantly enhanced in rice. Tank-mixed GA·IAA·BR 0.136% WP with penoxsulam 25 g/L OD enhanced the inhibition of photosynthesis, glucose metabolism and nitrogen metabolism in barnyardgrass, improved the control effect of penoxsulam on barnyardgrass, alleviated the stress of penoxsulam on rice, and promoted the growth of rice.

Key words plant growth regulator; herbicide; GA·IAA·BR; penoxsulam; *Oryza sativa*; *Echinochloa crus-galli* var. *mitis*; control efficacy

GA-IAA-BR 0.136% is ComCat O

Trial Overview

Effects of GA-IAA-BR 0.136% (ComCat O) wettable powder mixed with penoxsulam (herbicide) on the growth of Echinochloa crus-galli var. mitis (weed) and Oryza sativa (rice):

- Investigate whether the tank-mixed application of ComCat O alongside herbicide in paddy fields can enhance rice growth and suppress barnyard grass in the study.
- Results showed enhance inhibition of photosynthesis, glycose metabolism, nitrogen metabolism in barnyard grass, and improved the control effect of penoxsulam on barnyard grass, compared with only using herbicide. ComCat O also alleviated the stress of herbicide on rice and promoted rice growth.

Key Insights

- The study recorded and analyzed the indices related to growth of barnyard grass and rice after treatment: acetolactate synthase(ALS) activity, chlorophyll fluorescence parameters, glycose metabolism and nitrogen metabolism.

- Compared with only applying herbicide, the tank-mixed combination ComCat O + herbicide significantly increased the comprehensive index of herbicide injury by 13.2% and significantly decreased ALS activity by 27.61%, decreased the chlorophyll fluorescence parameters, glucose metabolism and nitrogen metabolism in barnyard grass 7 days after the treatment.

Academic Journal 2018 - Herbicide in Rice Fields

The Safety and Synergism of Mixture of Gibberellic Acid·Indol-3-ylacetic Acid·Brassinolide 0.136% WP and Herbicide in Rice Field

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2.Institute of Plant Protection, Heilongjiang Academy of Agricultural Sciences, Harbin 150086)

Abstract: [Aims] This study aims to determine the safety and synergism of gibberellic acid·indol-3-ylacetic acid·brassinolide 0.136% WP mixed with herbicide in paddy field. [Methods] Twelve plot experiments and laboratory enzyme determination were carried out with 0.136% Gibberellic acid·indol-3-ylacetic acid·brassinolide mixed with 5 herbicides using rice Daohuaxiang 2 and barnyardgrass as samples in paddy field. [Results] The mixed application of 0.136% gibberellic acid·indol-3-ylacetic acid·brassinolide+10% bispyribac-sodium and 0.136% gibberellic acid·indol-3-ylacetic acid·brassinolide+2.5% penoxsulam+45% quinclorac could regulate the growth of crops, enhance the safety and herbicidal effect of herbicides on crops. [Conclusions] 0.136% gibberellic acid·indol-3-ylacetic acid·brassinolide is recommended to ensure the safety and efficiency of herbicide in paddy field.

Key words: gibberellic acid·indol-3-ylacetic acid·brassinolide 0.136% WP; herbicide; safety; synergism
DOI:10.16820/j.cnki.1006-0413.2018.10.020

GA-IAA-BR 0.136% is ComCat O

Trial Summary

- This study aims to determine the safety and synergism of gibberellic acid·indol-3-ylacetic acid·brassinolide 0.136% WP (ComCat O) mixed with herbicide in paddy field.
- Twelve plot experiments and laboratory enzyme determination were carried out with 0.136% Gibberellic acid·indol-3-ylacetic acid·brassinolide mixed with 5 herbicides using rice Daohuaxiang 2 and barnyard grass as samples in paddy field.
- The mixed application of 0.136% gibberellic acid·indol-3-ylacetic acid·brassinolide+10% bispyribac-sodium and 0.136% gibberellic acid·indol-3-ylacetic acid·brassinolide+2.5% penoxsulam+45% quinclorac could regulate the growth of crops, enhance the safety and herbicidal effect of herbicides on crops.
- 0.136% gibberellic acid·indol-3-ylacetic acid·brassinolide is recommended to ensure the safety and efficiency of herbicide in paddy fields.

2017 Academic Journal - Potato Trial

Effects of 23.2% Rimsulfuron·Quizalofop-p-ethyl·Clethodim on Herbicidal Efficacy and Yield of Different Potato Varieties

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Abstract: In order to further clarify the safety and synergism of herbicide 23.2% rimsulfuron·quizalofop-p-ethyl·clethodim and 0.136% gibberellin·heteroauxin·brassinolide for potato herbicidal effect. We took Qingshu, Xiabodi, Helan 15, Jizhangshu and weeds after seedling *B. brassica* as research objects. Stem and leaf spray was carried out when seedling height was 10-15 cm. The results showed that when 23.2% rimsulfuron·quizalofop-p-ethyl·clethodim and 0.136% gibberellin·heteroauxin ·brassinolide were mixed, the control effect on grasses weeds was more than 90% and broadleaf weeds was more than 95%, and there was no harm to crops. It had a certain yield increasing effect on four kind of potato varieties, among which, the yield increasing rate was the highest, reaching 14.1%. The mixture of 23.2% rimsulfuron·quizalofop-p-ethyl·clethodim and 0.136% gibberellin·heteroauxin ·brassinolide had a good application prospect in the field of potato production.

Brassinolide 0.136% is ComCat O

2017 Academic Journal - Potato Trial

- The results showed that when 23.2% rimsulfuron-quizalofopp-thylchethodim and 0.136% gibberellin-hertoauxin-brassinolide (ComCat O) were mixed, the control effect on grass weeds was more than 90% and broad leaf weeds was more than 95%, with reduced damages to crop.

- There was also yield increase on four kinds of potato varieties, up to 14.1% increase

2018 Academic Journal - Soybean Trial

Effect of Biological Seed-coating Agent SN100 on Field Control and Soybean Yield

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Abstract: In order to effectively control diseases and insect pests in soybean seedling stage, the effect of biological seed-coating agent SN100 on disease prevention and yield increase was studied by large area comparison method. The results showed that SN100 biological seed-coating agent on soybean root rot and root miner preventing effect was higher than that of blank control, a significant improvement for yield traits in seedling stage and mature stage of soybean quality. The results showed that the biological seed-coating agent SN100 could increase the yield of soybean by 6.2% compared with the control and 3.4% compared with the commercial seed-coating agent BFA. It had no pollution to the environment, and had broad application and commercial development prospects.

AnnGro - unique patented transport vesicles that enclose nutrients and enhance uptake

AnnGro

AnnGro

NONPLANT FOOD INGREDIENT

Composition

3.75%	Ethyl esters of fatty acids

Directions for Use

AnnGro is a penetrant for use with liquid or water-soluble powdered fertilizers/nutrients.
Apply through irrigation systems. Use AnnGro with liquid products volume to volume ratio of 1:1000.

Mixing Instructions

Before mixing: Shake well before measuring out the required volume.

For mixtures with liquid fertilizers/nutrients: Thoroughly mix the liquid fertilizers/nutrients directly with the appropriate volume of AnnGro in a suitable container and allow it to stand for 30 minutes before adding the mixture to the mixing tank containing the appropriate volume of water. Agitate thoroughly again before irrigate.

For mixtures with powdered fertilizers/nutrients: Mix the powdered fertilizers/nutrients in a suitable container with the minimum amount of water needed to suspend the product. Add the appropriate amount of AnnGro® and thoroughly mix. Leave to stand for 30 minutes before adding the mixture to the tank containing the appropriate amount of water while continuously agitating thoroughly.

Storage

Store the product in a dry cool location. Avoid excess moisture and heat.

Information regarding the contents and levels of metals in this product is available on the internet at http://www.aapfco.org/metals.htm

AnnGro on Herbicides

In 2019, we tested of 42% fluridone SC + 33% pendimethalin EC with and spray additives (JiJian, Max, AnnGro, Synergistic King) on cotton. We varied the herbicide dosage and reduced it by 30%, 20%, and 10% compared with the conventional herbicide dosage.

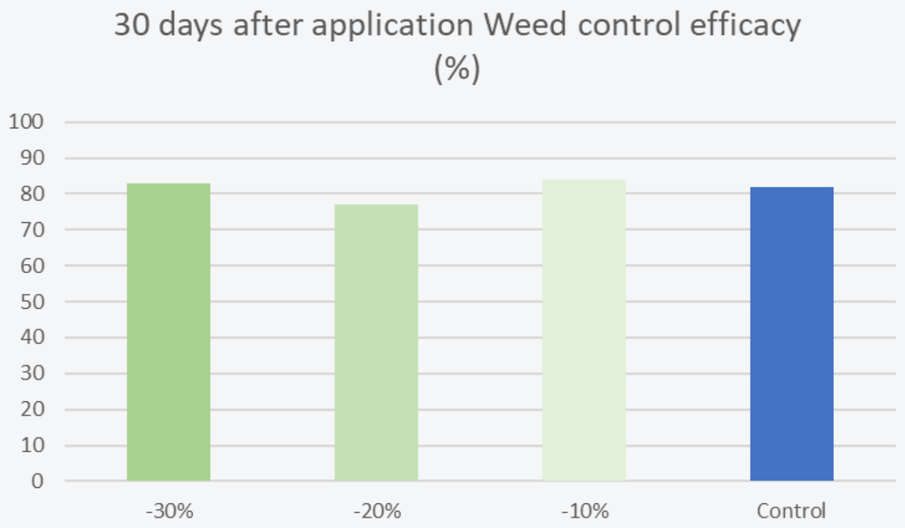
Result:

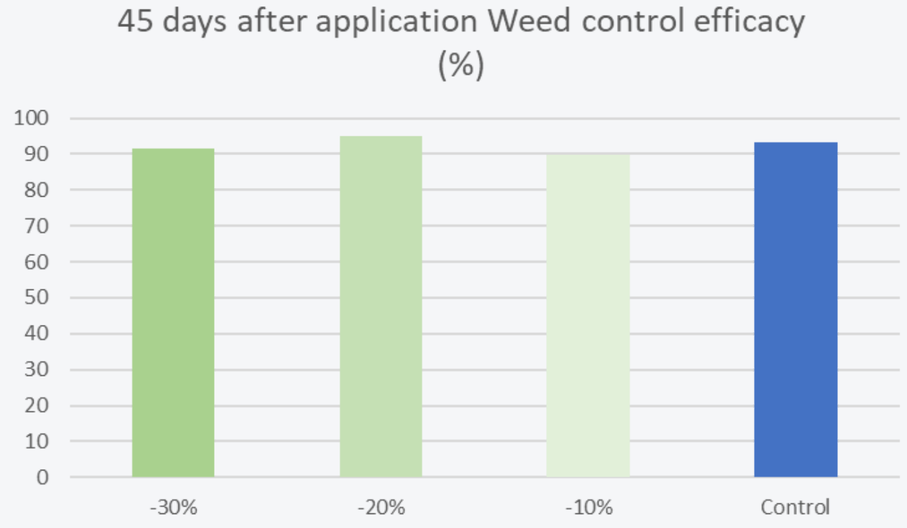
- Weed control efficacy of each treatment gradually increased over time. On the 60th day after treatment, the control efficacy and fresh weight control efficacy of each treatment on weeds were above 96%.
- **The reduction of 30%, 20%, and 10% of herbicides, while adding spray additives, have no significant difference in weed management results with the conventional herbicide dosage.**

Active Ingredients Applications and Results

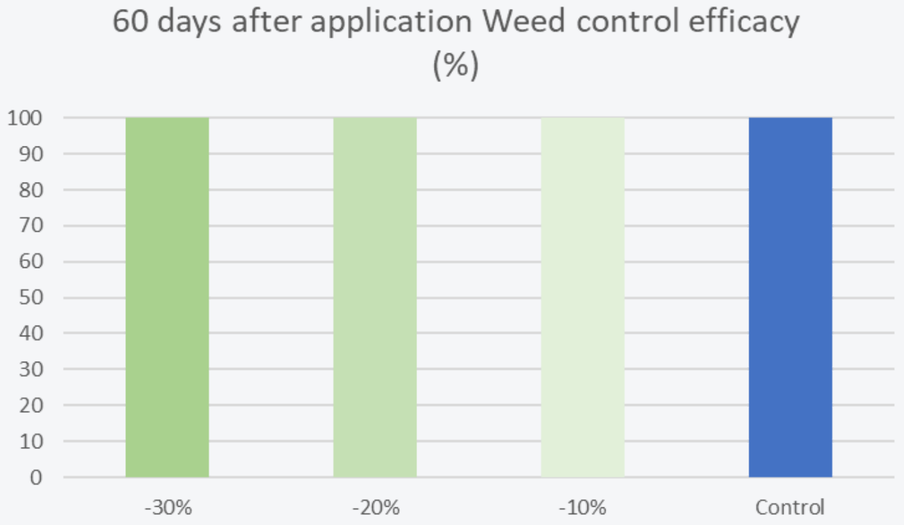
	Herbicide + Additives	Dosage	30 days after application		45 days after application		60 days after application	
		ml	Number of Plants	Weed control efficacy (%)	Number of Plants	Weed control efficacy (%)	Number of Plants	Weed control efficacy (%)
-30%	42% fluridone SC +33% pendimethalin EC +AnnGro	28+210+12	2.00	(82.86±1.78) a	0.56	(91.37±4.84)a	0	100 a
-20%	42% fluridone SC +33% pendimethalin EC +AnnGro	32+240+12	2,67	(77.14±5.39) abc	0.33	(94.82±7.00) a	0	100 a
-10%	42% fluridone SC +33% pendimethalin EC +AnnGro	36+270+12	1,89	(83.81±2.45) a	0.67	(89.65±3.51) a	0	100 a
Control	42% fluridone SC +33% pendimethalin EC (conventional dosage)	40+300+0	2,11	(81.90±4.60) a	0.44	(93.10±4.33) a	0	100 a

Weed Control Efficacy





When combined with the spray additives, no significant differences between reducing 30%, 20%, and 10% of herbicide substances and the conventional dosage in weed management results.



Trial Conclusion

- The data are excellent to prove that growers can reduce the active herbicide substance up to 30% and get the same results like the control while using safer additives for cotton, especially during the emergence period => **Save Costs**
- **The data also showed plant health and yield increases**

Glyphosate Isotopic Tracer study w/AnnGro

Slides were taken 4 days after treatment application of the areal plant parts

Glyphosate + AnnGro

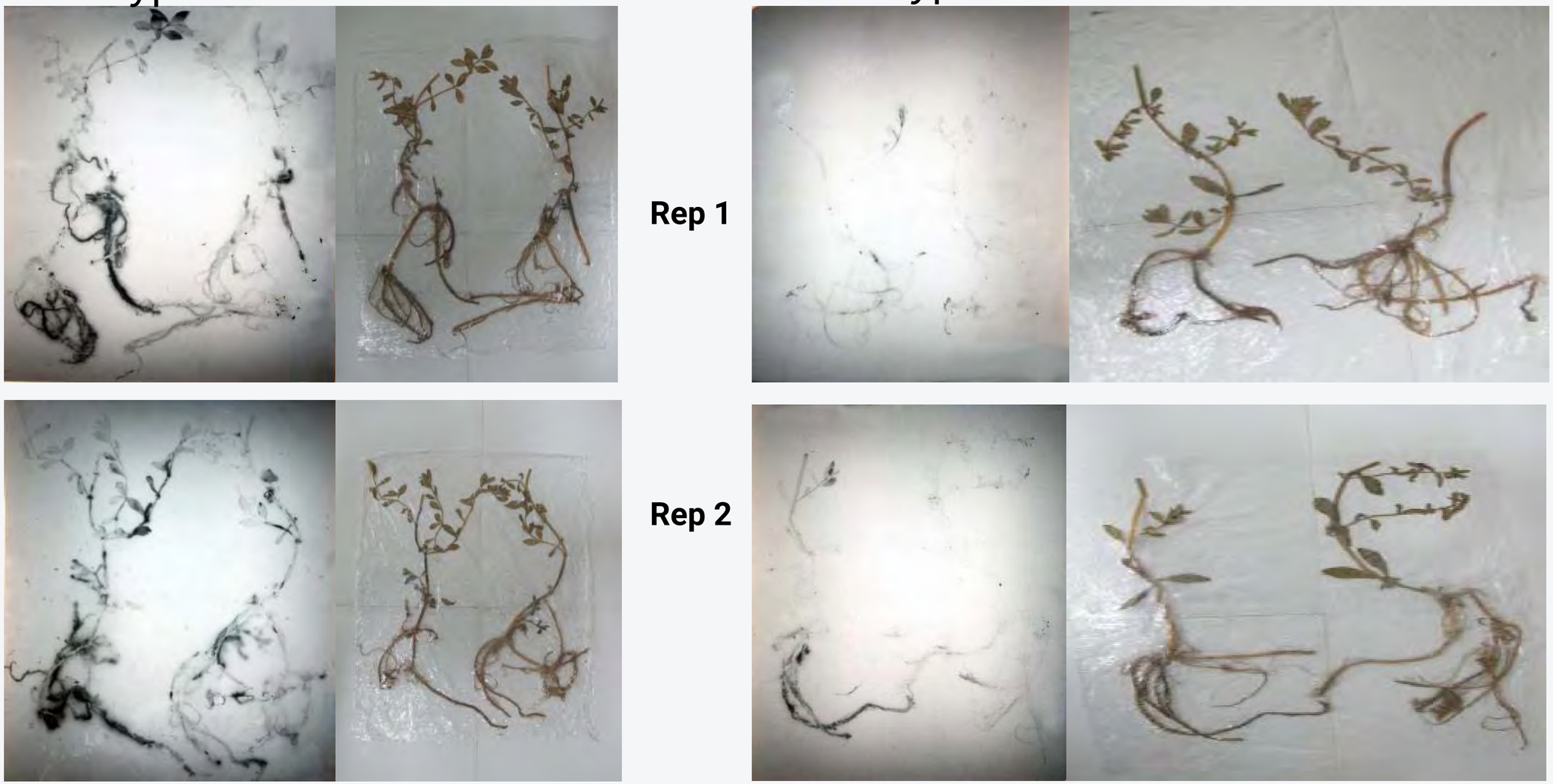
Glyphosate - AnnGro

Observation: the addition of AnnGro to radio active glyphosate showed a faster translocation downwards in the weed versus the control treatment.

Glyphosate Isotopic Tracer study w/AnnGro

Glyphosate + AnnGro

Glyphosate - AnnGro



Rep 1

Rep 2

The use of AnnGro increased the accumulation of glyphosate in the roots and stems of Alternanthera philoxeroides versus the control.

AnnGro & Glyphosate Jan 2020, Nelspruit

#	TREATMENT	Application rate	% Weed Control 10 Days After Application			
		Formulated product kg/ ha	Eleusine	Bidens spp	Convolvulus spp	Richardia spp
1	Glyphosate 540 SL Ammonium sulphate	1.3 L / ha 2%	15%	10%	10%	10%
2	Glyphosate 540 SL Ammonium sulphate	1.7 L / ha 2%	50%	45%	25%	25%
3	Glyphosate 540 SL Ammonium sulphate AnnGro 1 X	1.3 L / ha 2% 70 mℓ (0.1ml/gae)	40%	55%	33%	33%
4	Glyphosate 540 SL Ammonium sulphate AnnGro 1X	1.7 L / ha 2% 92 mℓ (0.1ml/gae)	85%	85%	45%	50%

Significant percentage of weed control increase!

Usage

Herbicide	Per Application
Typical herbicides such as Glufosinate, glyphosate	AnnGro: 40ml per acre + ComCat: 20-40g per acre
Salty herbicides	AnnGro: 40ml per acre + ComCat: 40g per acre

(easily mixed with other chemicals/nutrients)

SG Crop Solutions

Thank you for your attention!

Please reach out or visit our website for more information:
Email: mail@sgcropsolutions.com
Website: www.sgcropsolutions.com