48th TOBACCO WORKERS CONFERENCE, SOUTH CAROLINA

ROOT-KNOT NEMATODE MANAGEMENT IN ZIMBABWE : CURRENT AND FUTURE TRENDS

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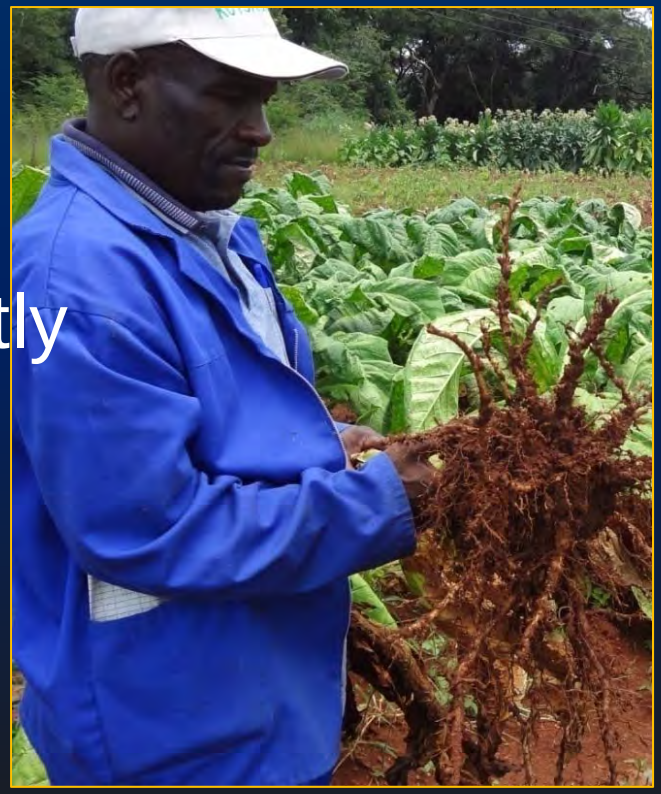
NEMATODE CONTROL IN ZIMBABWE

Has mostly relied on the use of the fumigants eg

- **Methyl-bromide** in the seedbeds and
- **1.3 D** and **EDB** in the field.

ADVANTAGES OF FUMIGANT NEMATICIDES

- have a broad-spectrum of activity,
- very effective when correctly applied
- Long period of control
- Good return on investment



SOME AGROCHEMICALS NO LONGER RECOMMENDED FOR USE ON TOBACCO IN ZIMBABWE

ACTIVE INGREDIENT	CATEGORY
1,3-Dichloropropene/Methyl bromide	Nematicide
Acephate, Thiodicarb	Insecticides
Alachlor, Trifluralin	Herbicide
Aldicarb	Nematicide/Insecticide
Benomyl	Fungicide
Dimethenamid, Metolachlor,	Herbicides
Ethylene dibromide	Nematicide
Fenvalerate	Insecticide
Methamidophos, Monocrotophos	Insecticides

ALTERNATIVE SYNTHETIC NEMATICIDES

TRB working on

- Chemical alternatives (seedbed and field)
- Genetic resistance
- Cultural control

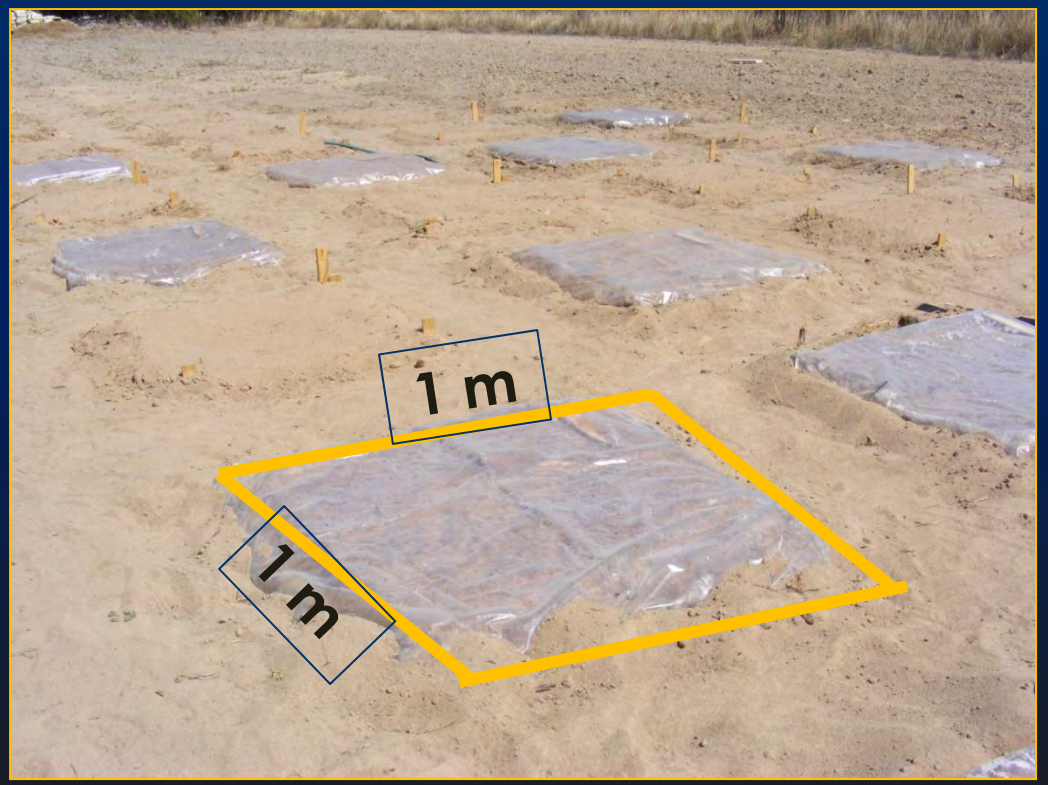
K RK71

SOME WORK ON THE CHEMICAL ALTERNATIVES

MATERIALS AND METHODS

Evaluation of Agrochemicals – Seedbed

- 1m² beds
- 3 blocks
- 2 varieties used
- 0.5 m x 0.45 m area pulled out for assessment



Evaluation of Agrochemicals - Field

THE TREATMENTS

1. an untreated control,
2. a standard,
3. The test product at the lab determined rate,
4. a lower
5. a higher rate

a resistant var

hree seasons

NEMATODE POPULATION EVALUATION

- Soil samples collected from around the base of the plants
- Taken to the greenhouse
- Susceptible tomato plants planted
- Galling on the tomato plants indicates nematode populations

GALLING ON TOMATO PLANTS

ROOT GALLING ASSESSMENTS

ROOT GALLING ASSESSMENTS

Daulton and Nasbaum (1961) scale of 0 – 8

SCORE	DEGREE OF GALLING
0	Free from galls
1	< 5 galls
2	Trace to 25 galls
3	20 – 100 galls
4	Numerous galls, mostly discrete
5	Numerous galls, many coalesced
6	Heavy, mostly coalesced
7	Very heavy, mass invasion, slight root growth
8	Mass invasion, no root development

Alternative Nematicides

The following were evaluated;

- Metham sodium
- Metham potassium

methyl isothiocyanate generators

- Methyl iodide
- Fluopyram
- Fluensulfone (MCW-2)

1. METHAM SODIUM

METHAM SODIUM - SEEDBEDS

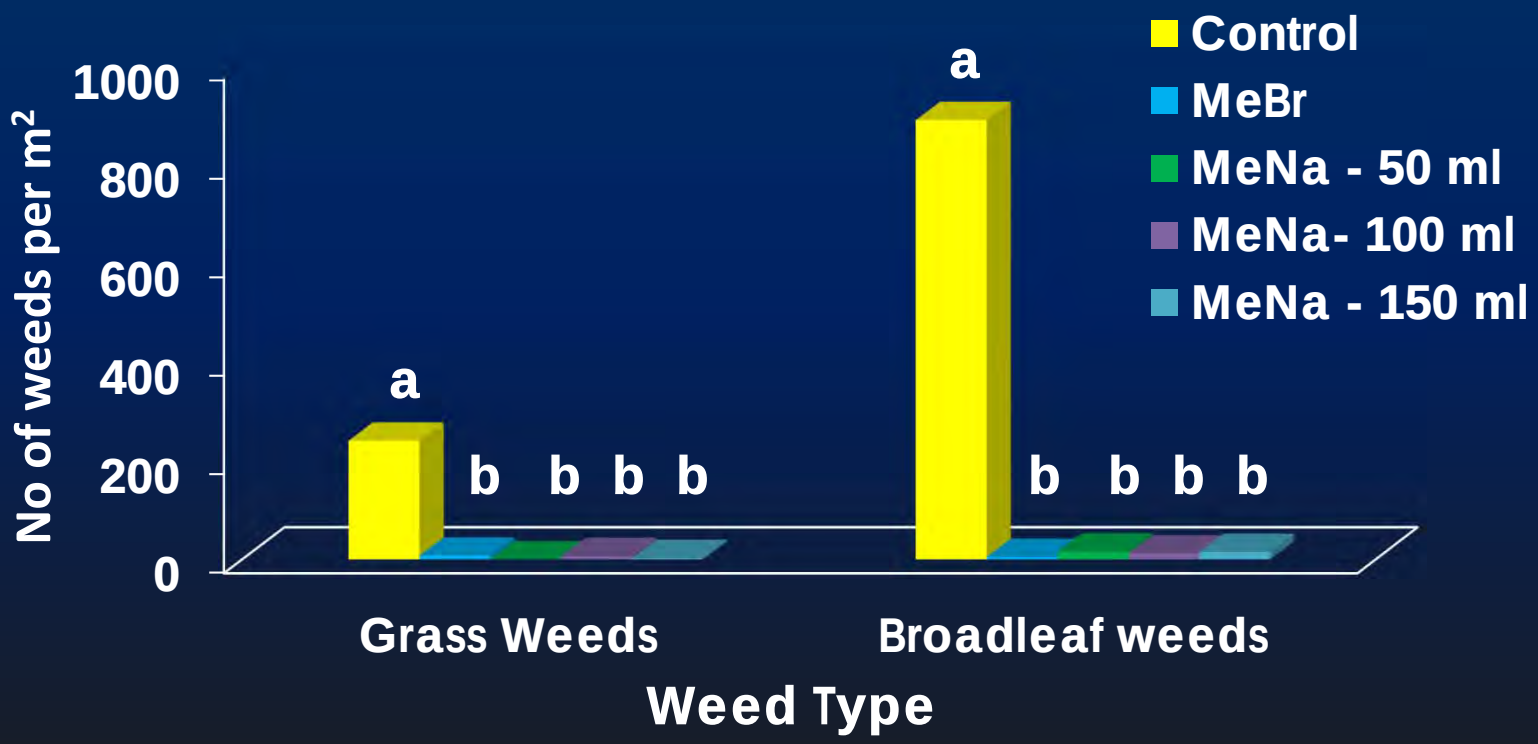
- Beds watered - activate weeds & nematodes.
- MeNa applied as a drench
- Covered - polythene sheets for 7 days.

METHAM SODIUM - APPLICATION

- Soil aerated - a fine tilth with a spade.
- Sowing - 28 days after product application.

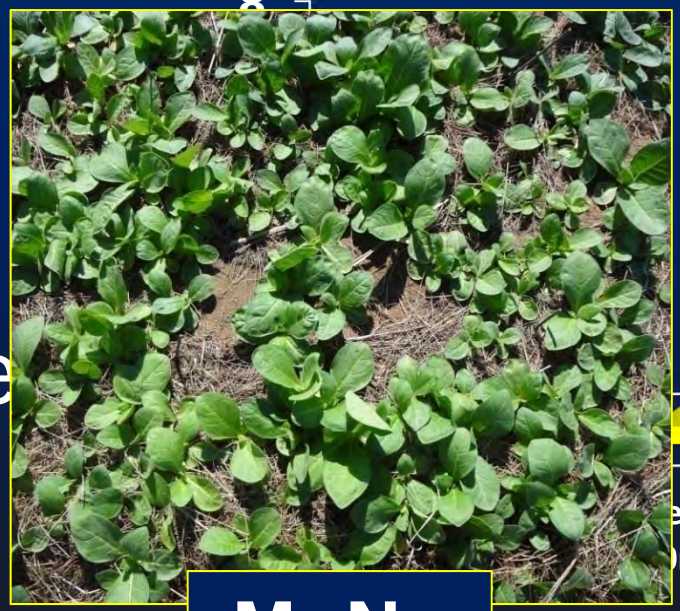
THE RESULTS

Weed populations in MeNa treated plots



The observation: Seedlings in MeBr, MeNa and untreated plots

MeBr



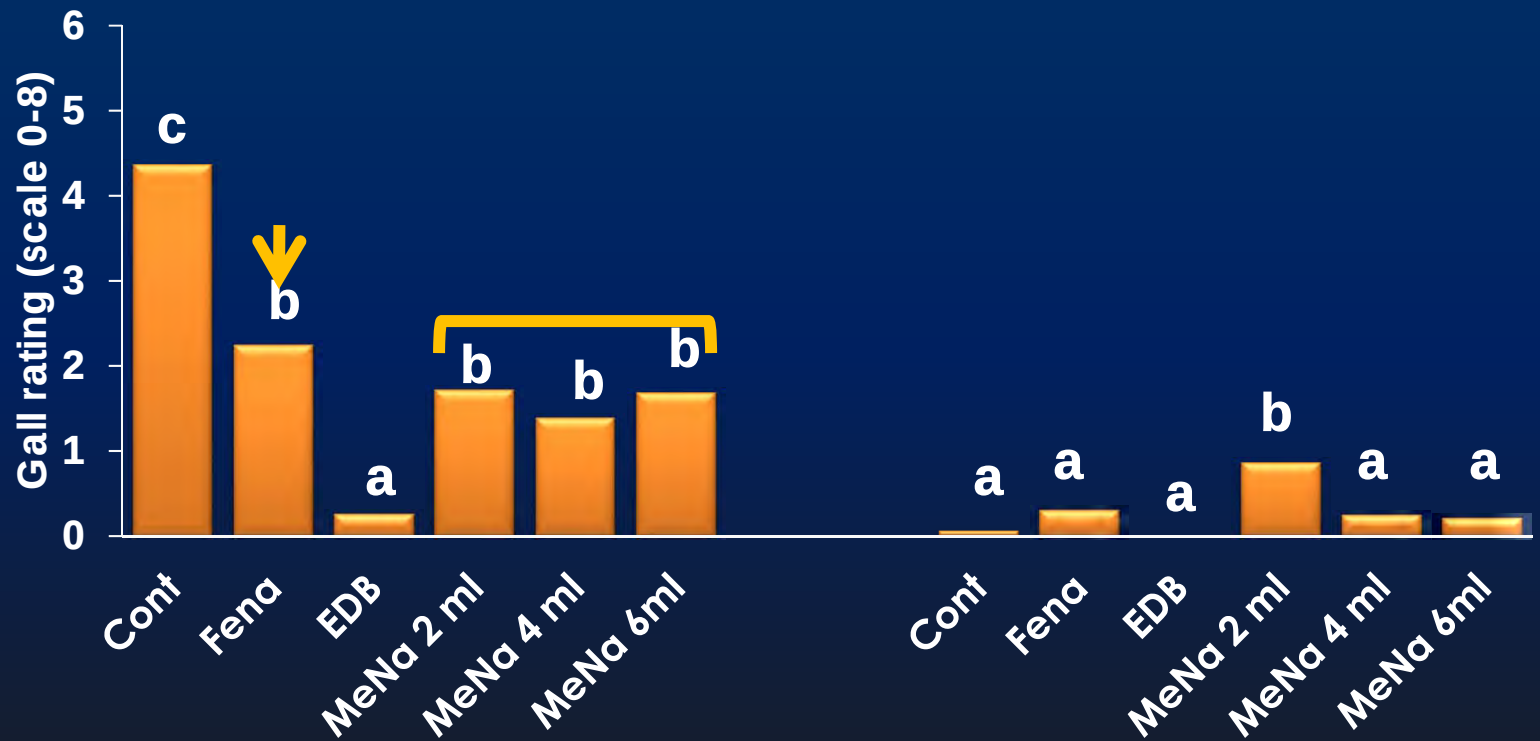
MeNa

Cont

METHAM SODIUM FIELD EVALUATION

Tractor Application

Performance of Metham sodium in the field



SUMMARY – METHAM SODIUM USE

- Broad spectrum activity in seedbeds - controls nematodes and weeds
- Registered at the rate of 100 ml in 4 L water/m^2
- In the field - applied at the rate of 4 ml/planting station

CHALLENGES WITH METHAM SODIUM USE IN THE FIELD

- Can give inconsistent performance if not properly applied.
- Reported to be corrosive to equipment

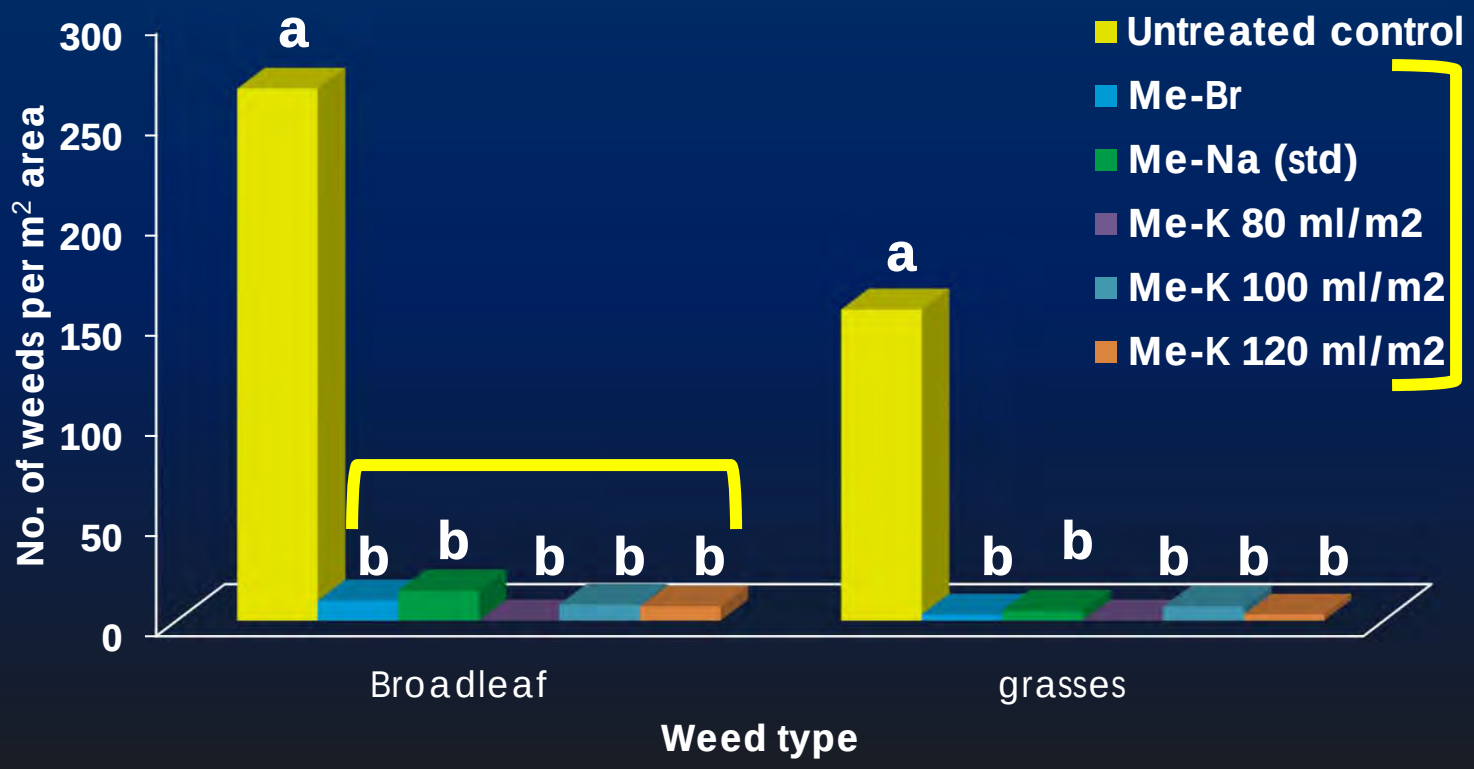
2. METHAM POTASSIUM &
3. METHAM IODIDE

APPLICATION METHOD

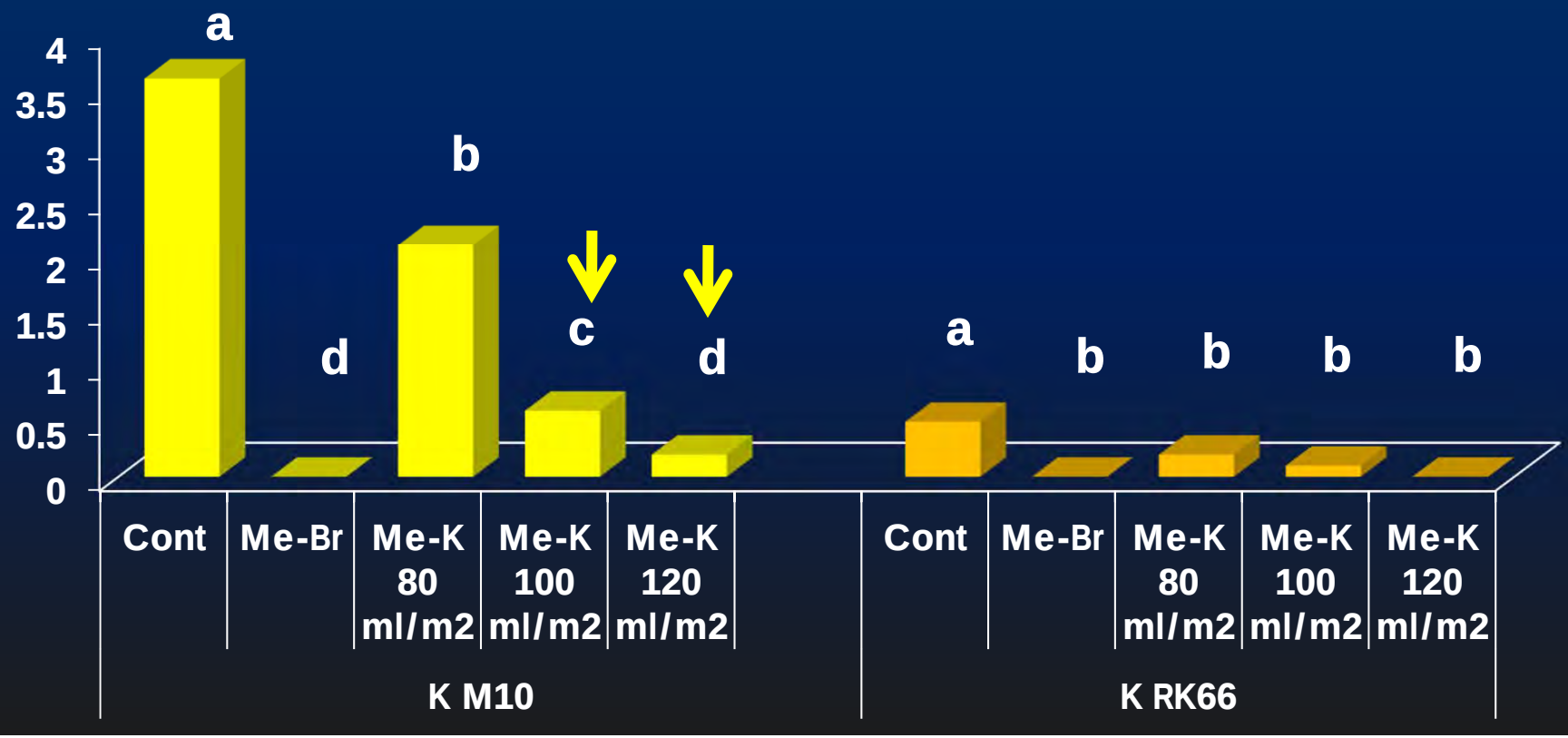
- MeK – same as Metham sodium
- Methyl Iodide - applied under 125 gauge polythene sheets.

2. RESULTS – METHAM POTASSIUM

Weed populations in Me-K treated plots

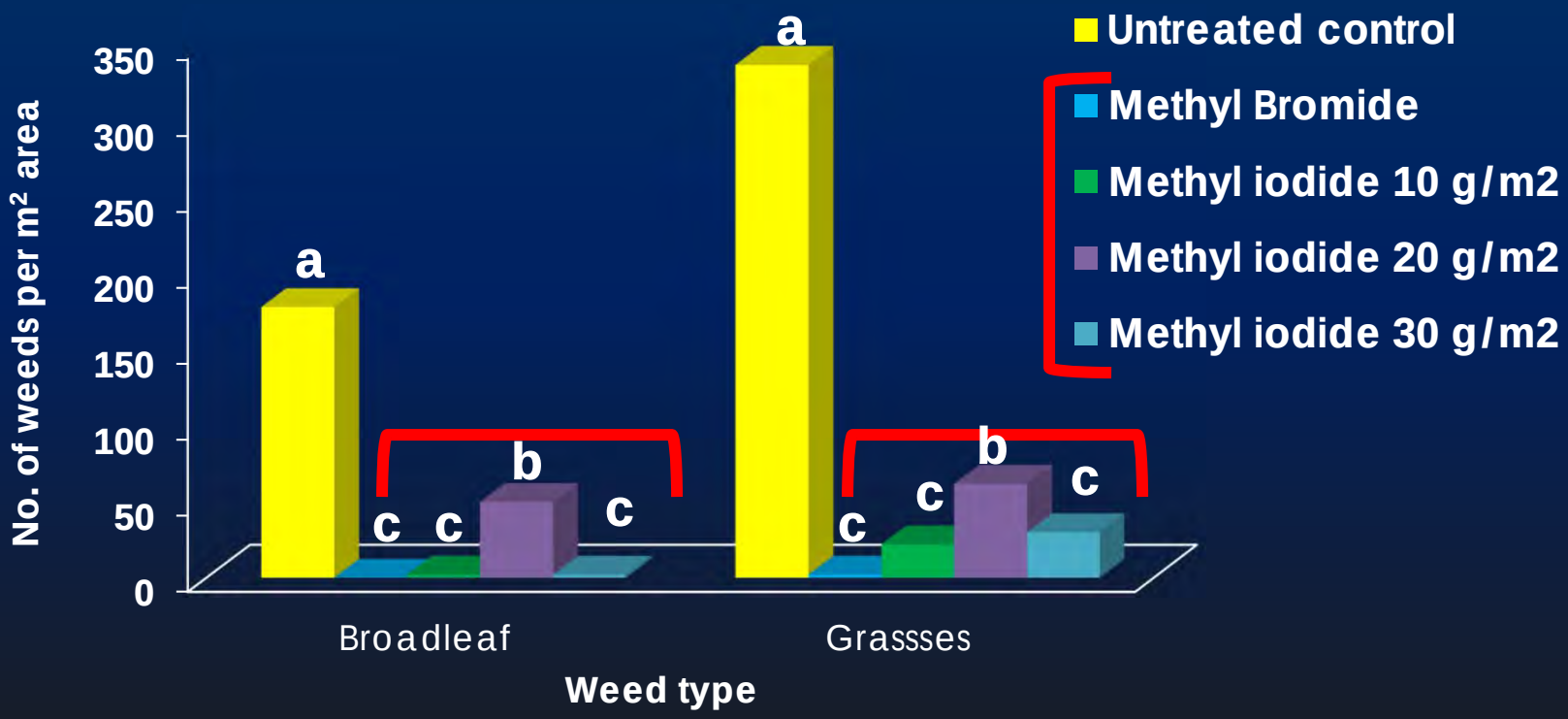


ROOT-KNOT NEMATODE ON SEEDLINGS

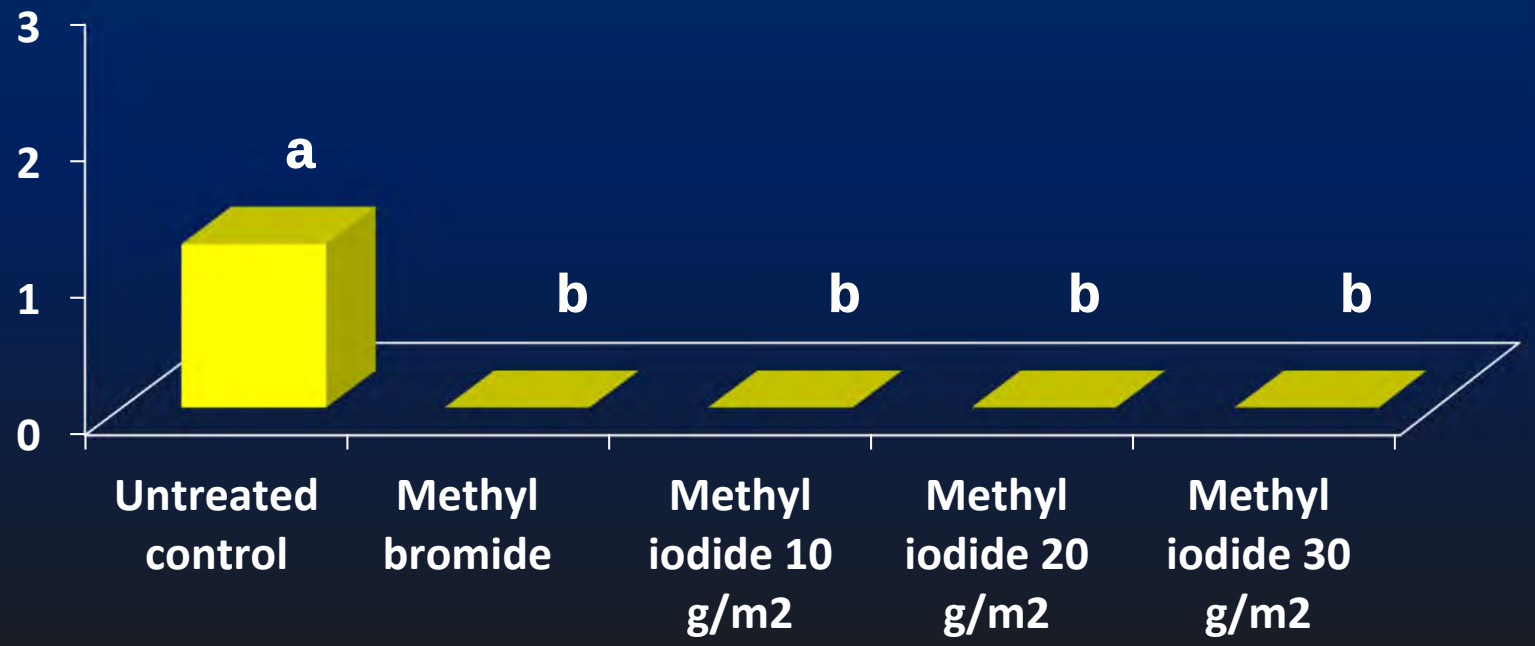


3. RESULTS - METHYL IODIDE

WEED COUNTS - METHYL IODIDE

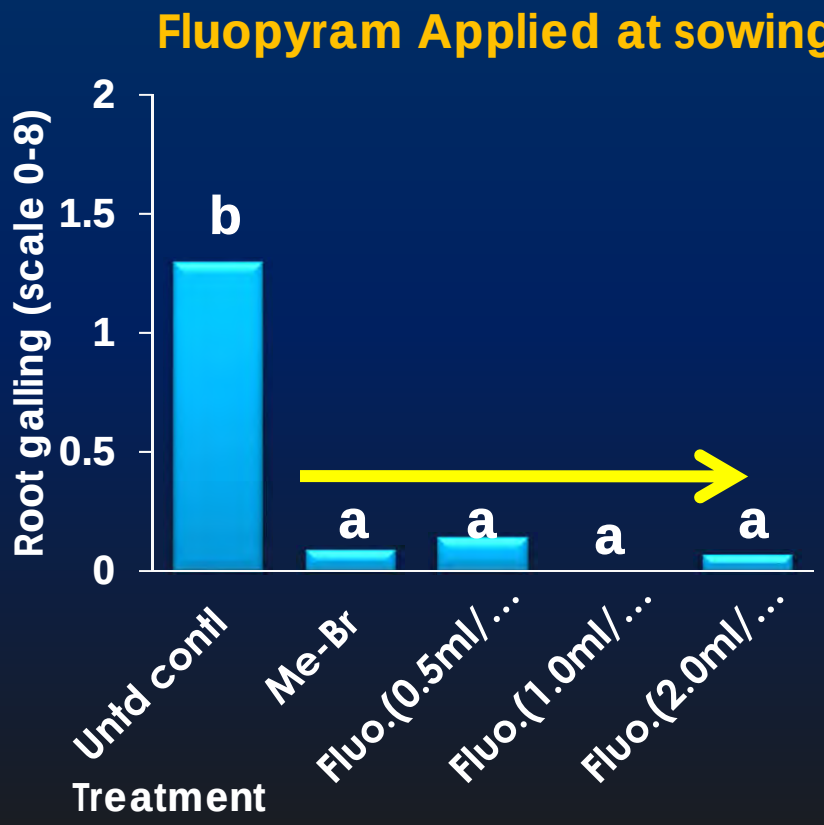


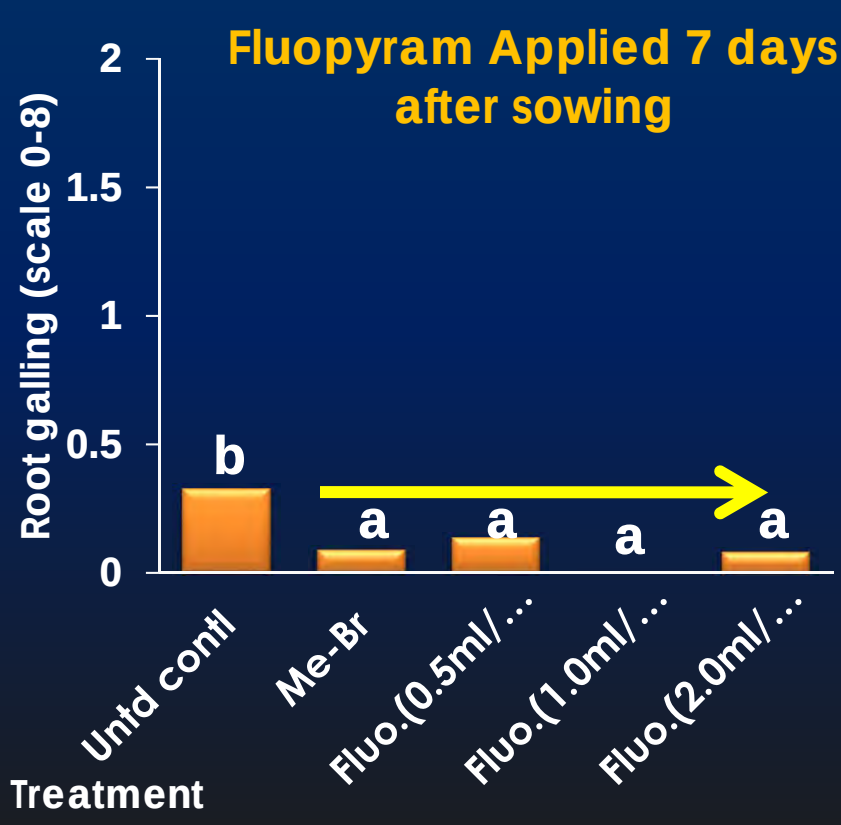
RKN GALL RATINGS ON SEEDLINGS FROM METHYL IODIDE TREATED PLOTS AT PULLING



4. FLUOPYRAM

RKN GALL RATINGS AFTER FLUOPYRAM APPLICATION





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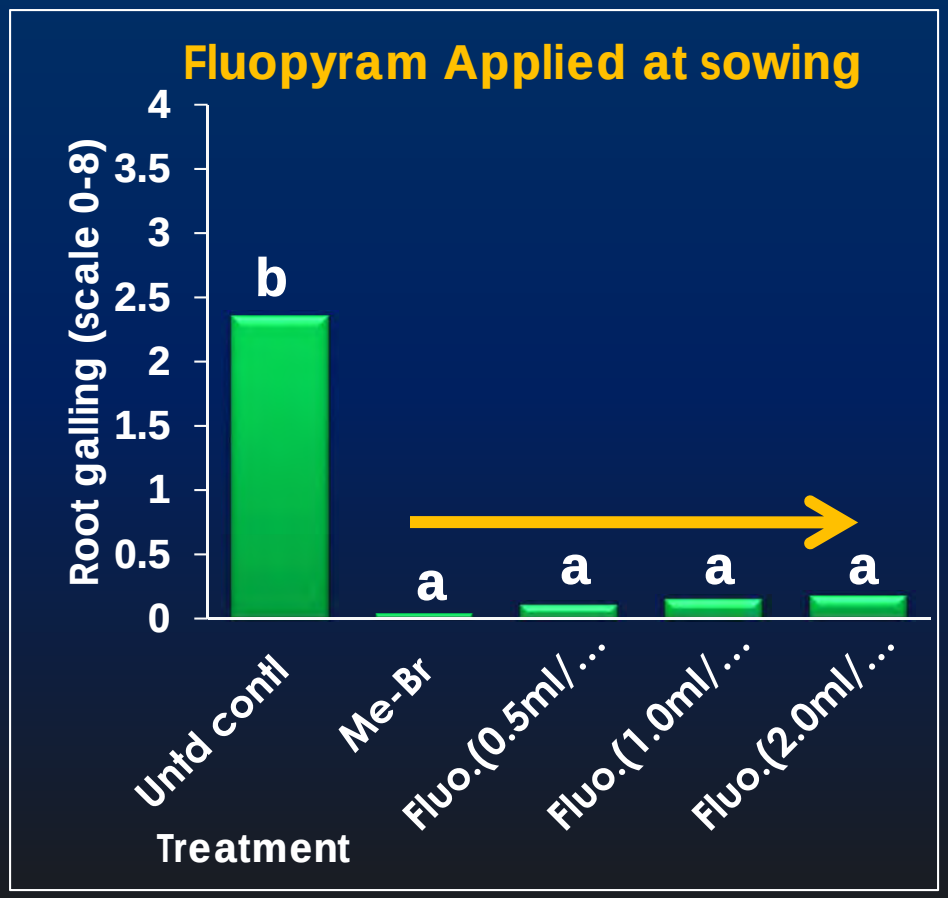
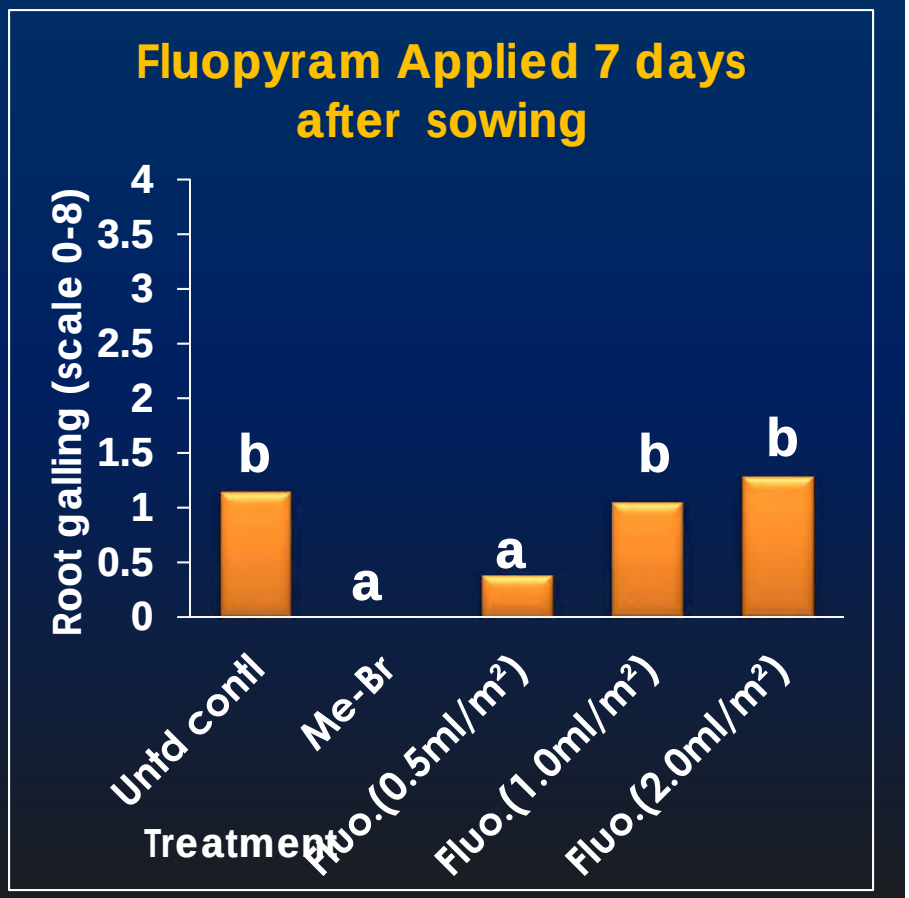
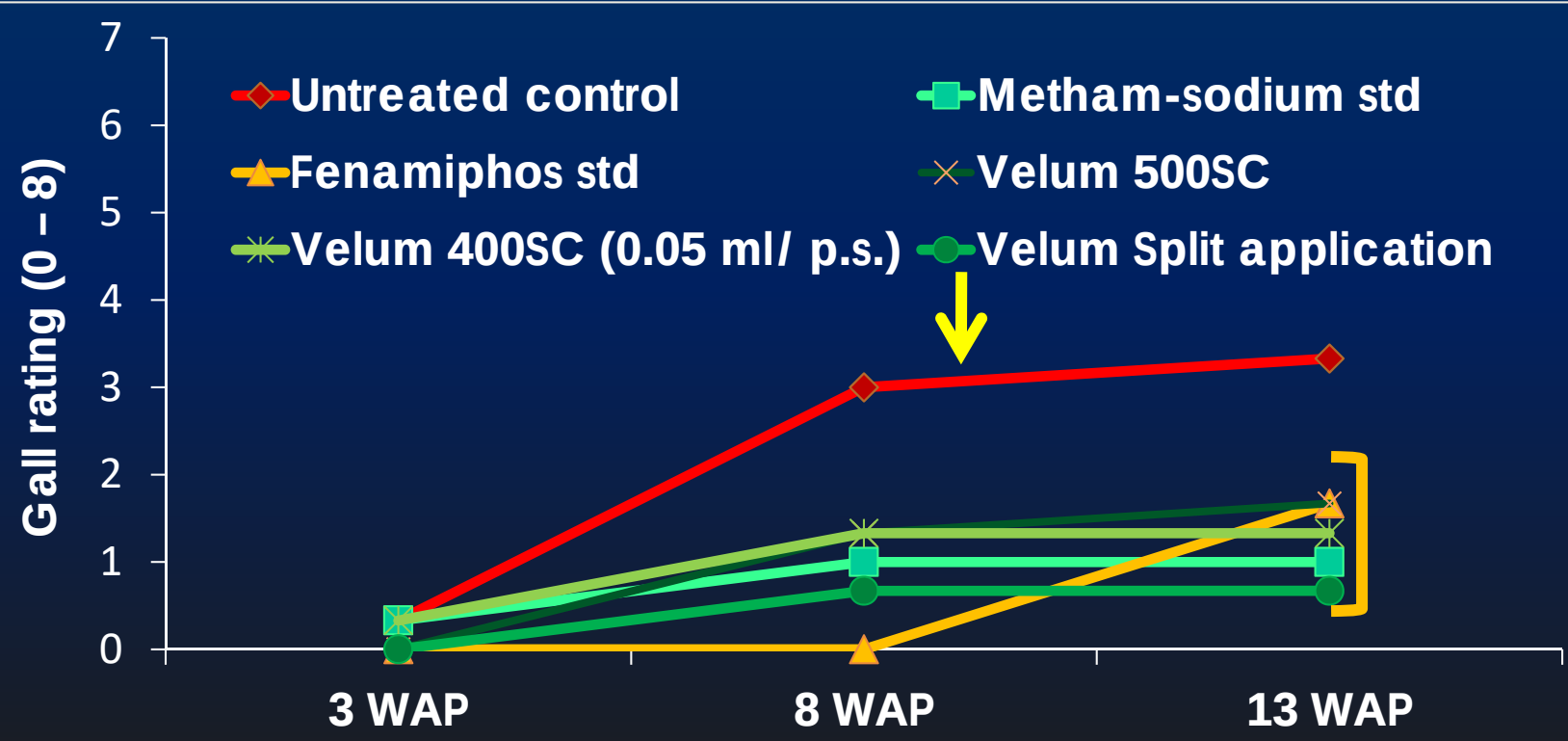
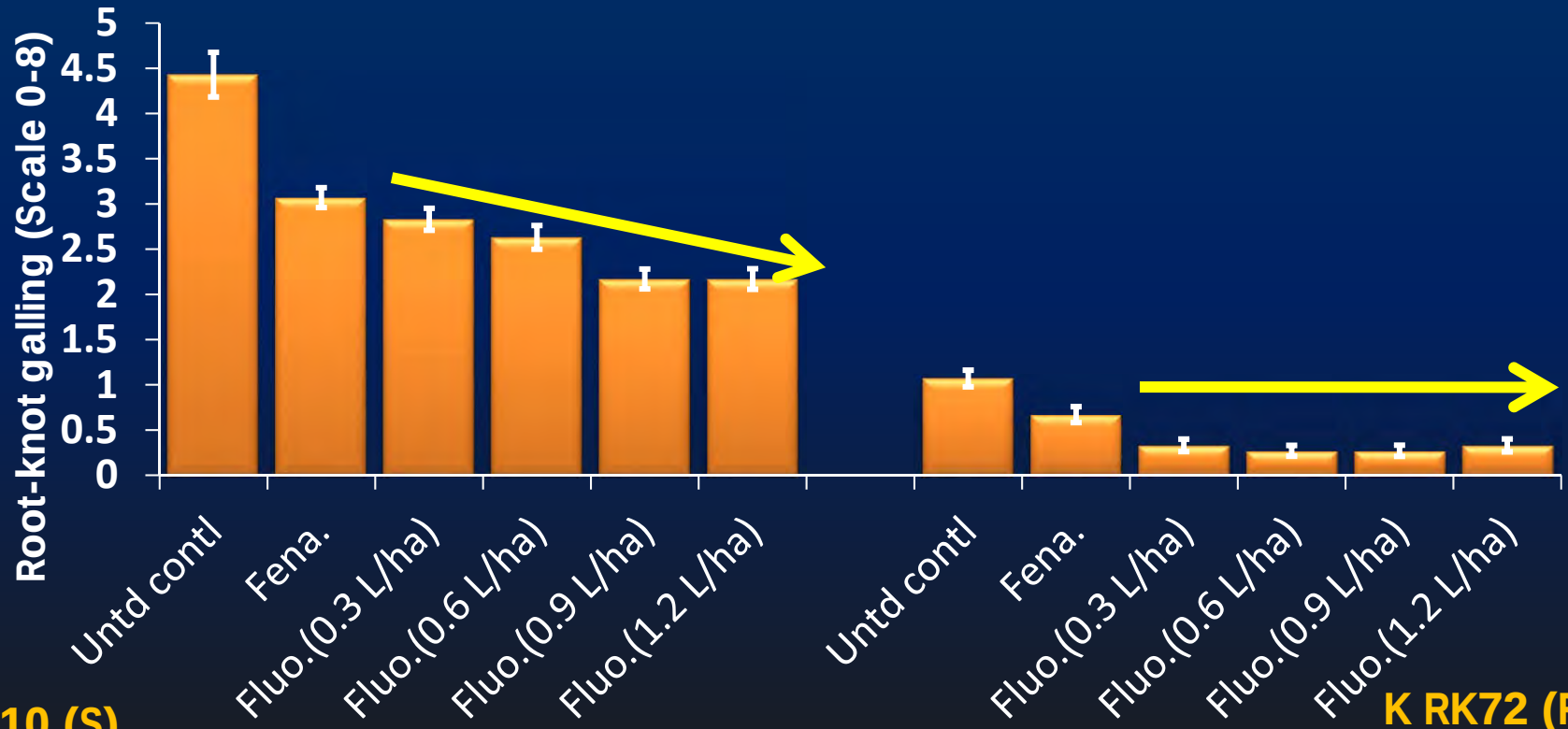




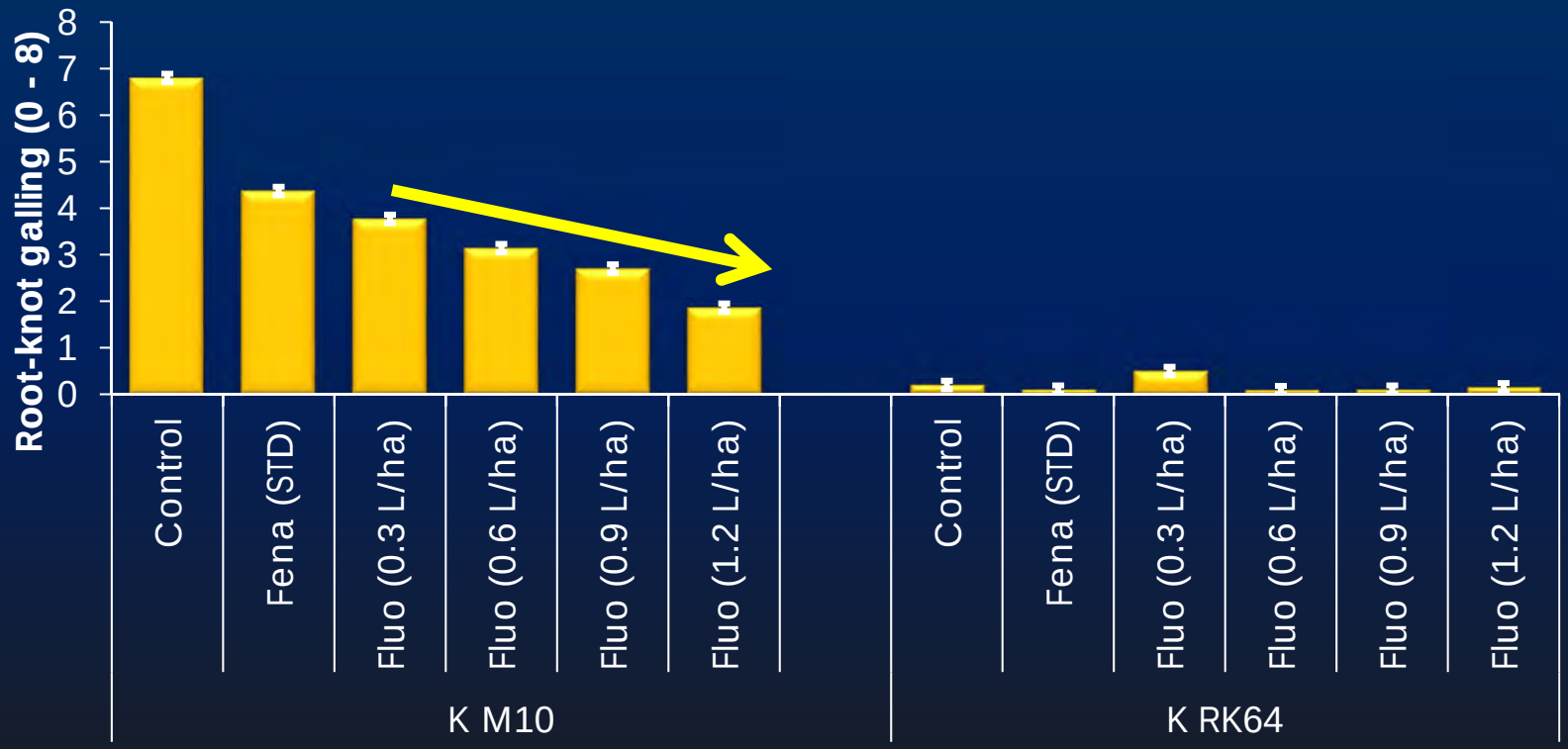
Galling of tomato plants from soil assayed in the greenhouse



Root galling in Fluopyram treated plots - 1



Root galling in Fluopyram treated plots - 2



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Please address all correspondence to the General Manager

10 April 2016

Dear Grower

RE: REGISTRATION OF FLUOPYRAM (VELUM®) FOR NEMATODE CONTROL IN TOBACCO

Fluopyram (VELUM® 500 SC*) has now been registered for use on tobacco against rootknot nematodes, in the lands (TRB Certificate Number 15-18-E-16).

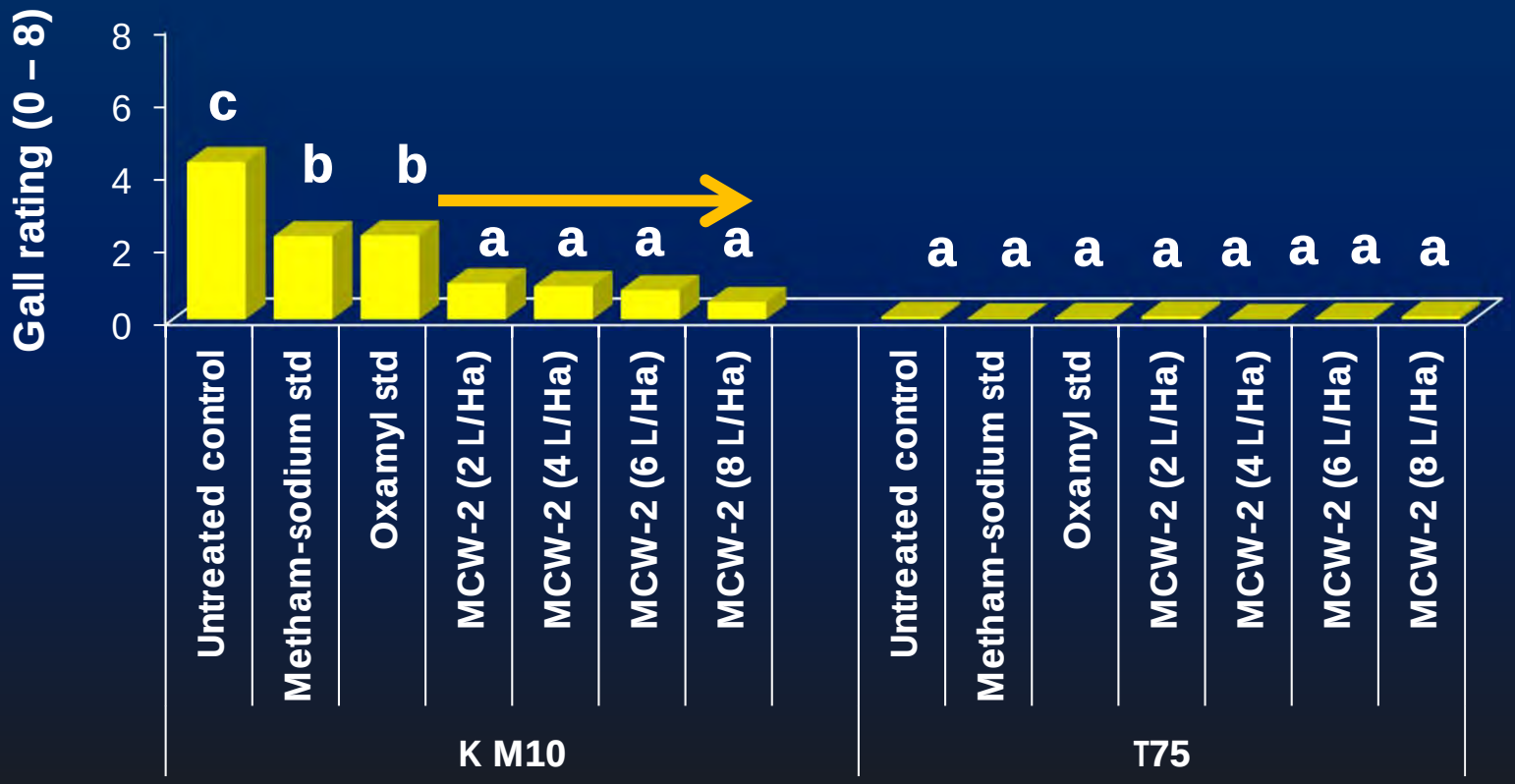
Fluopyram belongs to the chemical class known as pyridinyl ethylbenzamides and has been reported to control both nematodes and fungal pathogens. Its mode of action on

5. FLUENSULFONE (MCW-2) - ADAMA

FLUENSULFONE – FIELD TRIALS

1. Untreated control	
2. Metham sodium (STD)	60 L/ha
3. Oxamyl (STD)	3 L/ha
4. MCW-2	2 L/ha
5. MCW-2	4 L/ha
6. MCW-2	6 L/ha
7. MCW-2	8 L/ha

Root-knot nematode gall rating - 2015



Root-knot nematode gall rating - 2016

FLUENSULFONE (MCW-2) : SUMMARY

- Registered for use
- Applied in planting water @ 2 L in 450 L /ha)

ALTERNATIVE NEMATICIDES ON TOBACCO IN ZIM

CHEMICAL NAME	COMMON NAME	FOR USE
1. Potassium N-methyldithiocarbamate	Metham Potassium	Seedbeds
2. Iodomethane	Methyl iodide	Seedbeds
3. Tetrahydro-3,5-dimethyl-2H-1,3,5- thiadiazine-2-thione	Dazomet®/Basamid®	Seedbeds
4. Sodium N-methyldithiocarbamate	Metham Sodium	Seedbeds/ Field
5. Fluopyram - Bayer	Velum®	Field
6. Fluensulfone - Adama	MCW 2	Field

NON-CHEMICAL ALTERNATIVES

NON-CHEMICAL ALTERNATIVES - SEEDBEDS

- The floating tray system

FLOATING TRAY SYSTEM

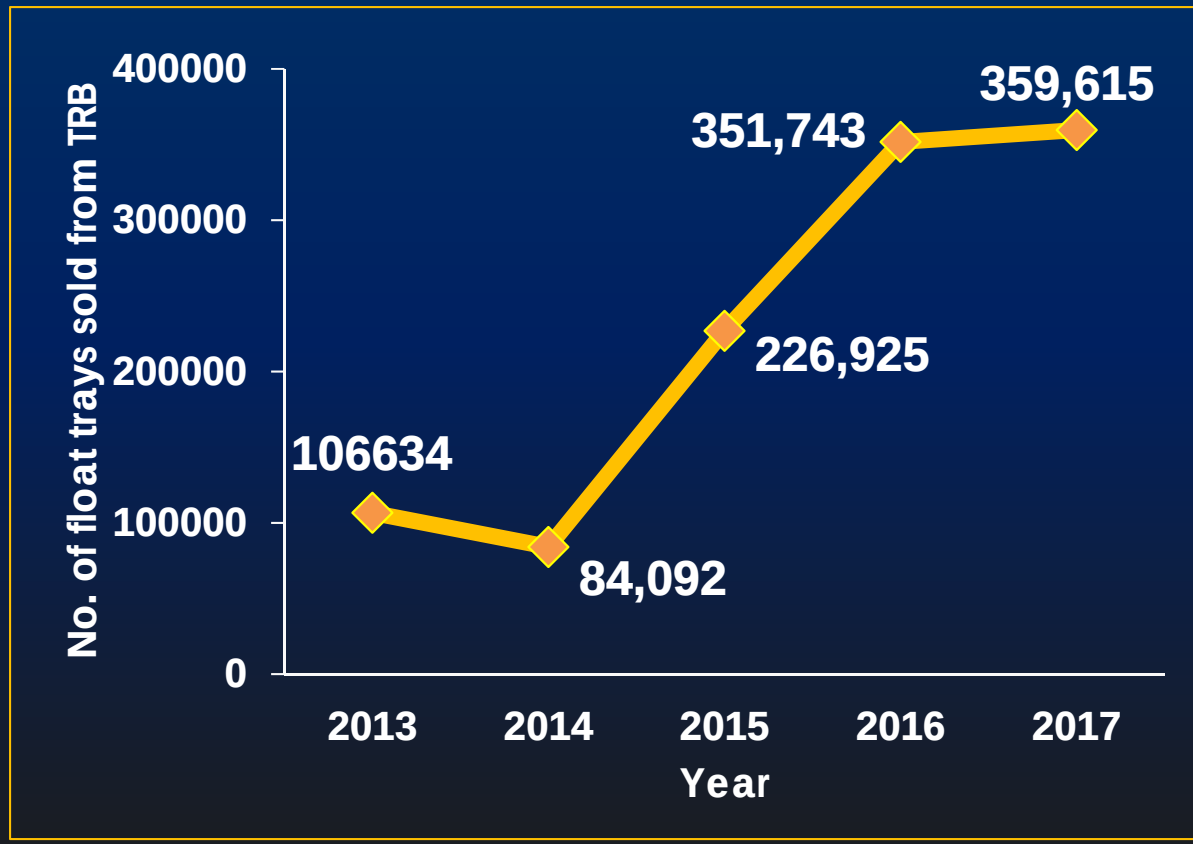
Pine bark based

2:1:2

200, 242 & 120 cells

THE FLOATING TRAY SYSTEM - ADOPTION

- Adoption rate reported to be 30-40%
- Float trays sales data show the **increased use**



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Kaylite: Wrecking Sunshine city | The Herald

www.herald.co.zw/kaylite-wrecking-sunshine-city/

Oct 11, 2011 - These **trays** are made up of a type of **plastic** calle

non-**biodegradable**

block sunlight from r

The death of marine

Cleaning up Zimbabwe with a styrofoam ban - The Zimbabwean

www.thezimbabwean.co/2017/10/cleaning-zimbabwe-styrofoam-ban/

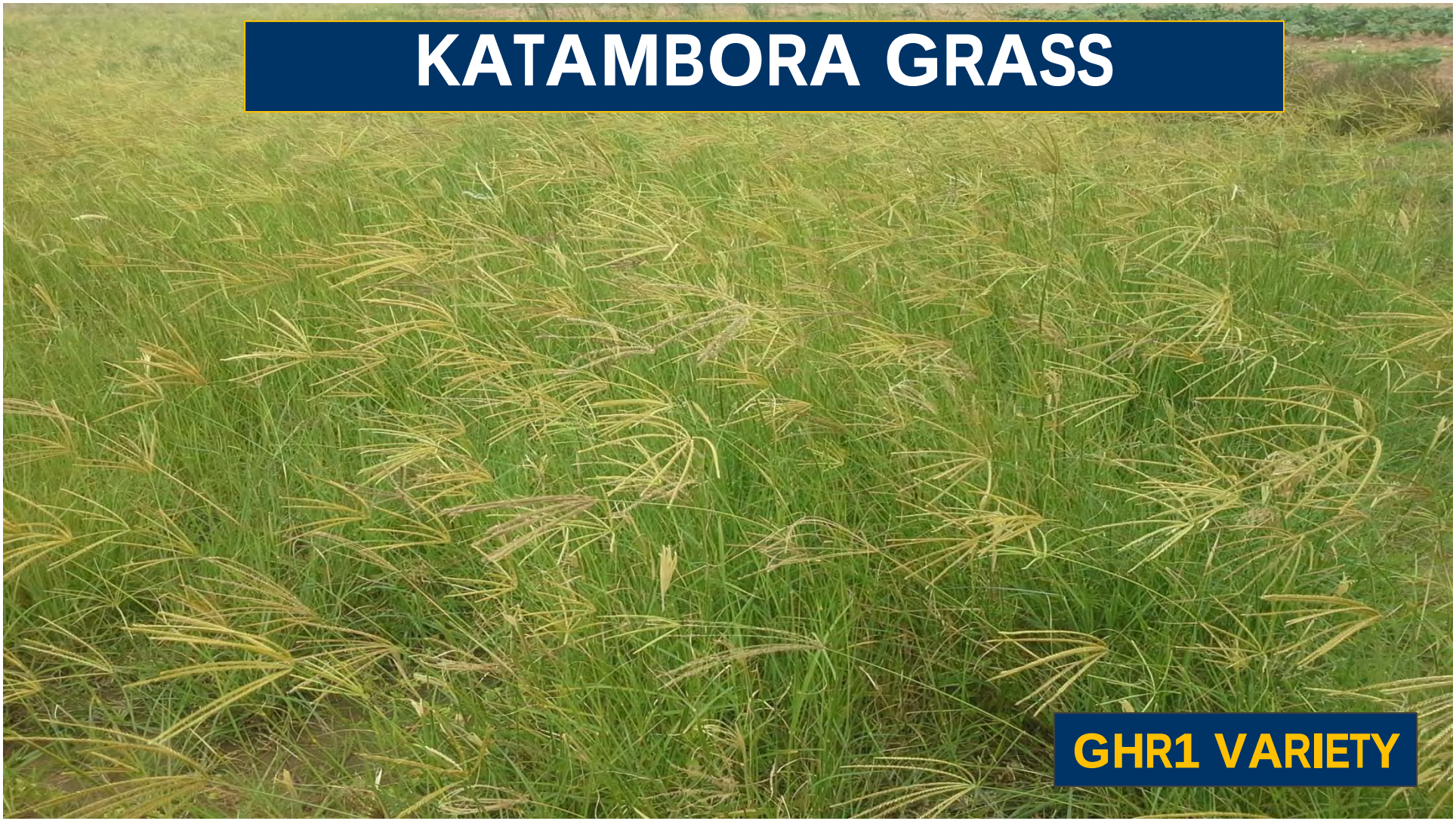
Oct 3, 2017 - Cleaning up **Zimbabwe** with a **styrofoam** ban. **Styrofoam** pollution is a serio
in **Zimbabwe**. The government is set to ban the ubiquitous material for use in food containe
promote greener alternatives. But not everyone is happy with the move.

Zimbabwe Temporarily Lifts Ban on Foam Food Containers - VOA

https://www.voanews.com/a/zimbabwe-environment-styrofoam-eps.../3949063.html

Jul 18, 2017 - **Zimbabwe's** Environmental Management Agency has temporarily lifted its ba
use of expanded **polystyrene** (EPS) as food packaging material to allow businesses to clea
stocks. The Agency says it has given businesses until October 17 to stop using existing co
replace them with ...

CULTURAL PRACTISES – **CROP ROTATIONS**



RESISTANT VARIETIES

ROOT GALLING IN A SUSCEPTIBLE AND RESISTANT VARIETY POST-REAPING

KM10

T 75

SUSCEPTIBLE VS RESISTANT VARS UNDER HIGH NEMATODE PRESSURE

KM10 IN LAND WITH HIGH NEMATODE PRESSURE

UNFUMIGATED KM10

FUMIGATED KM10

K RK72 IN LAND WITH HIGH NEMATODE PRESSURE

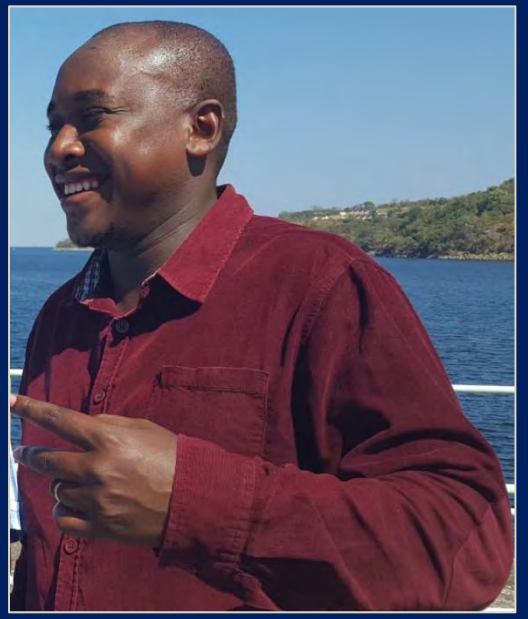
UNFUMIGATED

FUMIGATED

THE TEAM BEHIND THE WORK

Tafadzwa Mahere

Privilege Makunde



Dr Cleopas Chinheya

Thank you