



MGA Conference 2024

Trial results

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Weed control in maize 2023



2023 herbicide trials - Cheshire

2 mm of rainfall was recorded for the three weeks after pre-emergence treatments were applied.

No vigour differences were detected between both pre & post emergence treatments except the controls were consistently slightly less vigorous.

Main weeds present:

- *Grasses (Ryegrass)*
- *Orache*
- *Mayweed*
- *Fumitory*
- *Cranesbill*
- *Thistle*
- *Redshank*
- *Sun spurge*



2023 Weed Control Results



Chemical	% weed control. 55 DAT	Timing
Wing-P @ 4L/ha	97	Pre-emergence
Pendimethalin @ 3L/ha	79	
Dual Gold @ 1.4L/ha	86	

2022 results:

Chemical	% weed control. 58 DAT	Timing
Wing-P (Pendimethalin + Dimethenamid P) @ 4L/ha	85	Pre-emergence
Pendimethalin @ 3L/ha	37	
Dual Gold (S-metolachlor) @ 1.4L/ha	59	

2023 Weed Control Results



Chemical	% weed control. 26 DAT	Timing
Callisto @ 0.75L/ha	47	Post-Emergence
MaisTer @ 150g/ha + Mero @ 0.1L/ha	63	
Nicosulfuron @ 0.5L/ha + Callisto @ 0.75L/ha	89	
Callisto @ 0.75L/ha + Peak @ 20g/ha	63	
Casper @ 0.3kg/ha + Activator 90 @ 0.1%	51	

Sequential maize herbicide trial - Warwickshire

Rationale – can rates be reduced when used in a sequence with other herbicides, and still provide a robust weed control strategy that produces high yields.



Main weeds present:

- *Fat hen*
- *Cleavers*
- *Knotweed*
- *Orache*
- *Bindweed*
- *Groundsel*

Treatment No	Treatment	Rate	Application timing A= Pre-em B= Post-em
1	Untreated		
2	Wing P	4.0	A
3	PDM (Most Micro)	3.0	A
4	Wing P	2.5	A
	Maister	0.2	B
	Mero	0.1	B
5	PDM (Most Micro)	2.5	A
	Maister	0.2	B
	Mero	0.1	B
6	PDM (Most Micro)	3.0	A
	Diva	0.8	B
7	Wing P	3.0	A
	Diva	0.8	B
8	PDM (Most Micro)	2.5	A
	Callisto	0.5	B
	Milagro (Entail)	0.3	B
9	Wing P	2.5	A
	Callisto	0.5	B
	Milagro (Entail)	0.3	B
10	PDM (Most Micro)	2.5	A
	Callisto	0.5	B
11	Wing P	2.5	A
	Callisto	0.5	B
12	Wing P	4.0	A
	Callisto	0.8	B
	Milagro (Entail)	0.5	B
13	Stomp Aqua	3.00	A
	GF-3967	0.480	B
	Codacide Oil	1.0	B

Sequential maize herbicide trial results



Treatment No	Treatment	Rate	Application timing A= Pre-em B= Post-em	Yield (t/ha DM)
1	Untreated			100%
2	Wing P	4	A	166%
3	PDM (Most Micro)	3	A	485%
4	PDM (Most Micro) Maister Mero	2.5 0.2 0.1	A B B	669%
5	Wing P Maister Mero	2.5 0.2 0.1	A B B	324%
6	PDM (Most Micro) Diva	3 0.8	A B	566%
7	Wing P Diva	3 0.8	A B	387%
8	PDM (Most Micro) Callisto Nicosulfuron (Milagro)	2.5 0.5 0.3	A B B	632%
9	Wing P Callisto Nicosulfuron (Milagro)	2.5 0.5 0.3	A B B	542%
10	PDM (Most Micro) Callisto	2.5 0.5	A B	514%
11	Wing P Callisto	2.5 0.5	A B	470%
12	Wing P Callisto Nicosulfuron (Milagro)	4 0.8 0.5	A B B	570%
13	Stomp Aqua GF-3967 Codacide Oil	3 0.48 1	A B B	533%

569% more yield



No vigour differences were detected between both pre & post emergence treatments except the control was consistently less vigorous.

Growing maize with reduced herbicides



Rationale – With the future focusing on promoting sustainable crop growing, can farmers use fewer active ingredients per hectare growing maize by switching to hoeing and/or band spraying.

Trial	Pre-em	Post-em 1 -2 leaf stage	Post-em 2 - 6 leaf stage	Post-em 3 - 10 leaf stage
1	Untreated			
2		Hoeing		
3		Hoe + Band spray Nico + Callisto		
4	Wing P 4l/ha	Hoeing		
5	Wing P 4l/ha	Hoe + Band spray Nico + Callisto		
6	Wing P 4l/ha	Hoeing	Hoe + Band spray Nico + Callisto	
7	Wing P 4l/ha	Hoeing	Hoeing	
8		Hoeing	Hoeing	
9		Hoeing	Hoeing	Hoeing
10	Wing P 4l/ha	0.5l/ha Nicosulfuron + 0.75l/ha Callisto		
11	Harrowing	Hoeing		
12	Harrowing	Hoeing	Hoeing	



5 x 5 rule:

1. 5 cm away from maize row
2. 5 cm deep
3. 5 cm overlap between tines
4. 5 cm soil to throw into row
5. 5 hrs. of dry weather to desiccate weeds

Growing maize with reduced herbicides results



The effect of applying forage maize herbicides to beans

Treatments

Pre-Emergence:

Wing P @ 4.0 l/ha

Pendimethalin @ 3.0 l/ha

Dual Gold @ 1.4 l/ha

Post Emergence applied when the Bean plants @ 2 mature leaves

Callisto @ 0.75 l/ha

MaisTer @ 150 g/ha + Mero @ 0.1 l/ha

Callisto @ 0.75 l/ha + Millagro @ 0.5 l/ha

Callisto @ 0.75 l/ha + Peak @ 20 g/ha

Casper @ 0.3 kg/ha + Activator 90 @ 0.1%



The effect of applying forage maize herbicides to beans

- Pre- emergence treatments showed some phytotoxicity on the beans compared to the untreated at the first assessment but at the second assessment 55 DAT complete ground cover was seen.
- All post emergence treatments showed signs of severe phytotoxicity and later retarded growth despite some recovery



Casper and Aviator



Callisto and Peak



Callisto



Dual Gold



Milagro and Callisto



Maister and Mero



Pendimethalin



Wing P



Maize & Beans Southwest trial



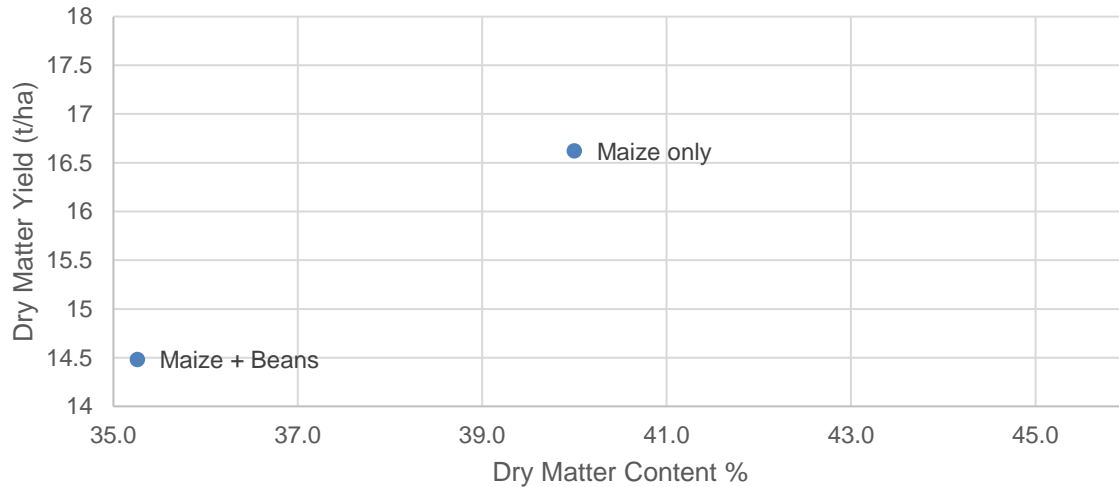
NIAB small plot harvester weighing and sampling each replicate at the trial.



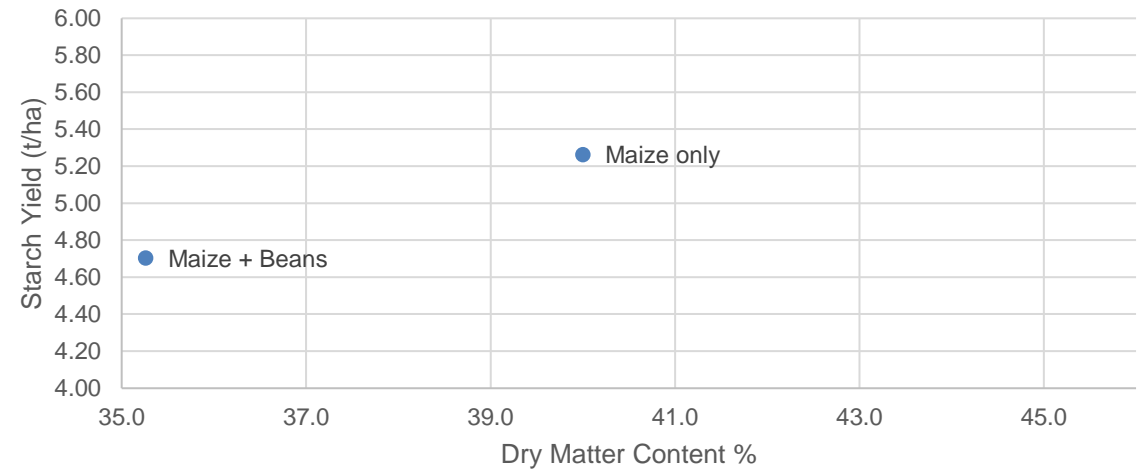
Maize & Bean SW trial



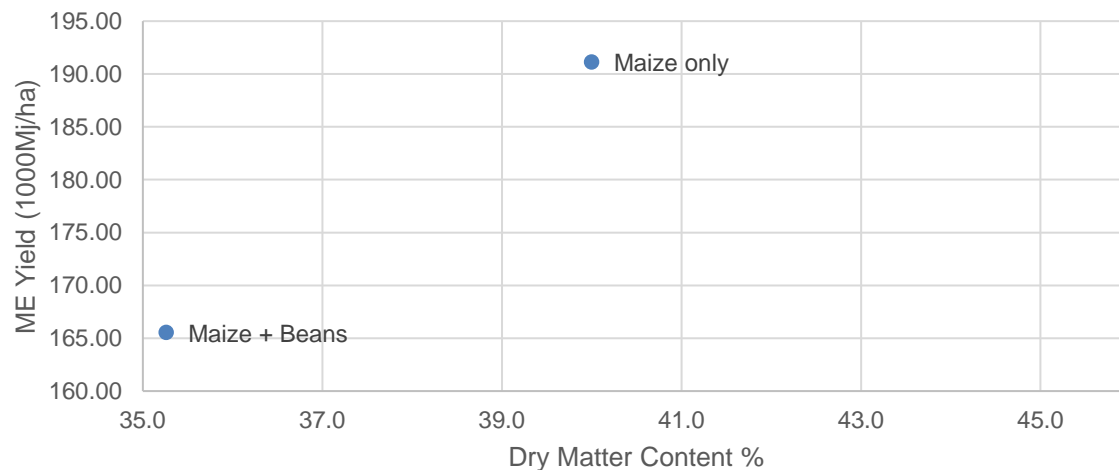
MGA SW Trial site 2023
Maize + Beans DM% vs DM Yield



MGA SW Trial site 2023
Maize + Beans DM% vs Starch Yield



MGA SW Trial site 2023
Maize + Beans DM% vs ME Yield



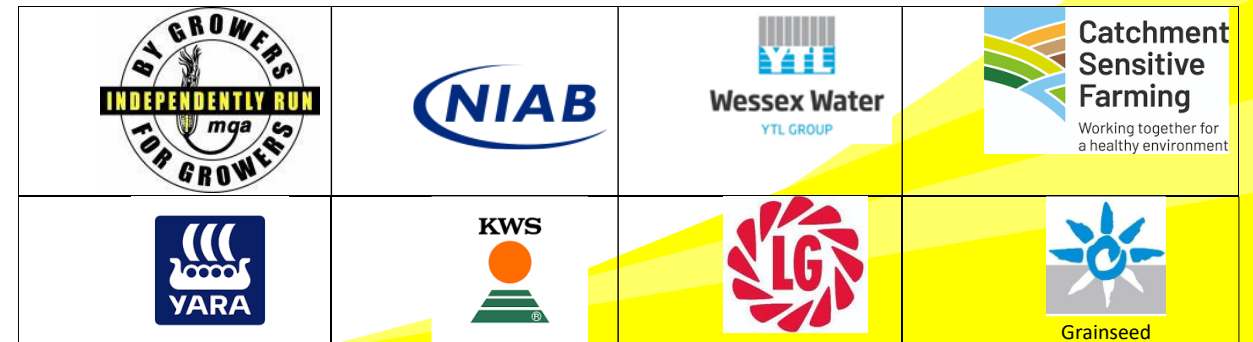
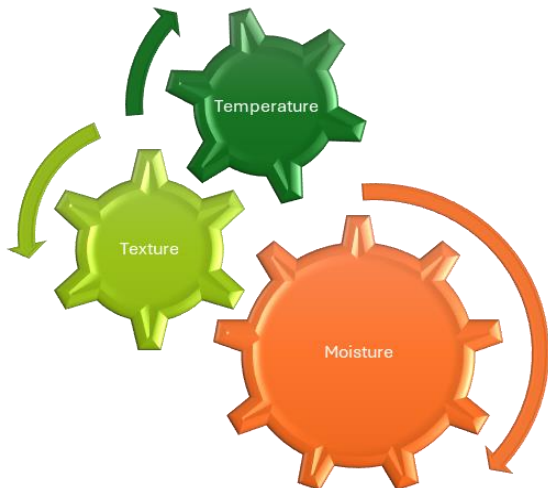
- While there is a negative yield trend when comparing the yield and quality, they are not significant.
- Weed control in the maize & beans plots, was not as good as the maize grown alone.
- Competition for nutrient and moisture between the maize and beans appears to have impacted on the yield and maturity.
- **The lack of post-em herbicides will limit future success**



Soil Nitrogen Supply (SNS) through the growing season

Aim is to better understand the release of Soil Nitrogen

- Deep soil Nitrogen Testing
 - Three sites – soil type & weather
- Tissue (leaf) testing on each site
- Literature review of relevant data
- First report available to members via office



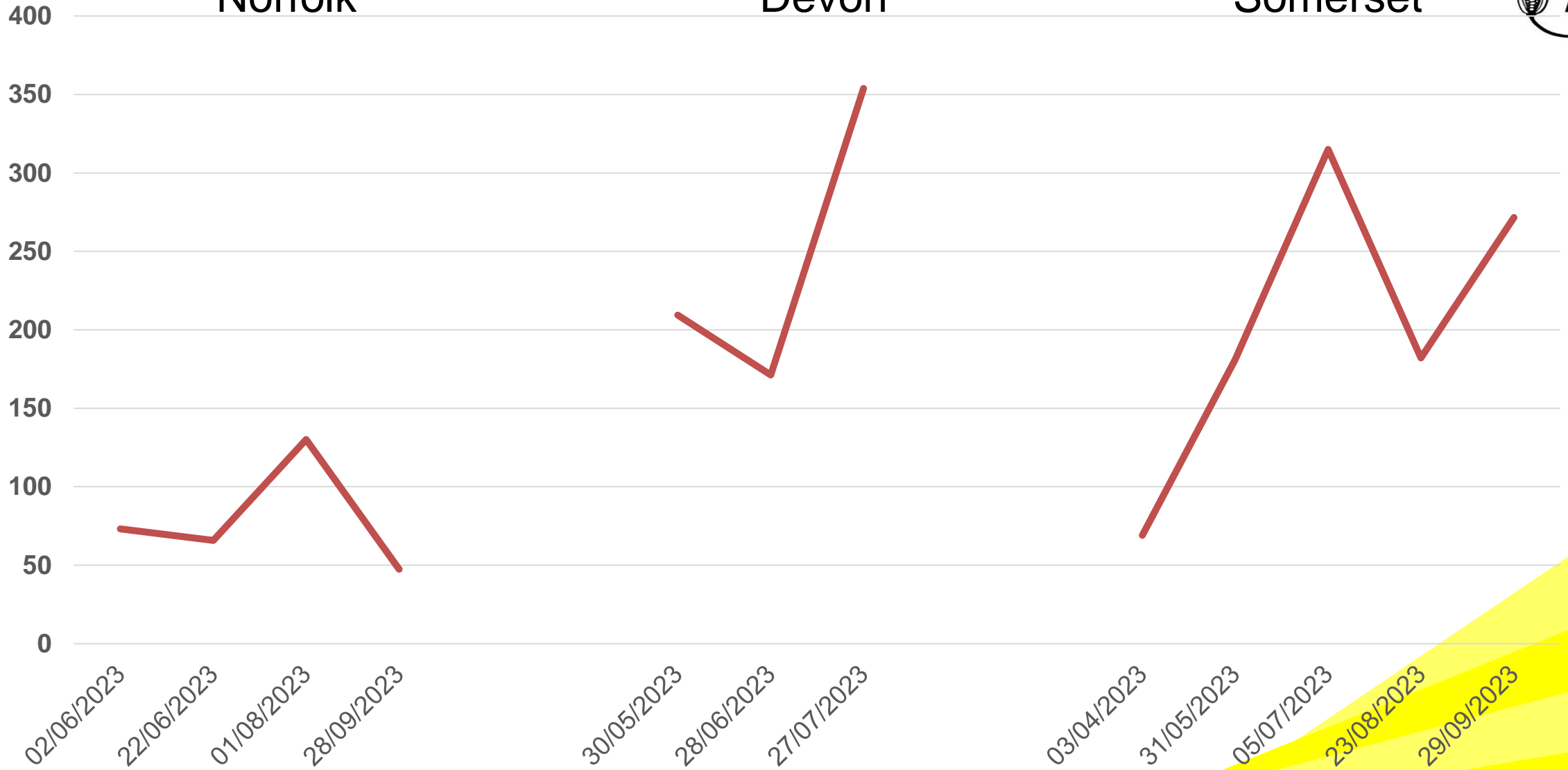
Soil Mineral N (kg/ha)



Norfolk

Devon

Somerset





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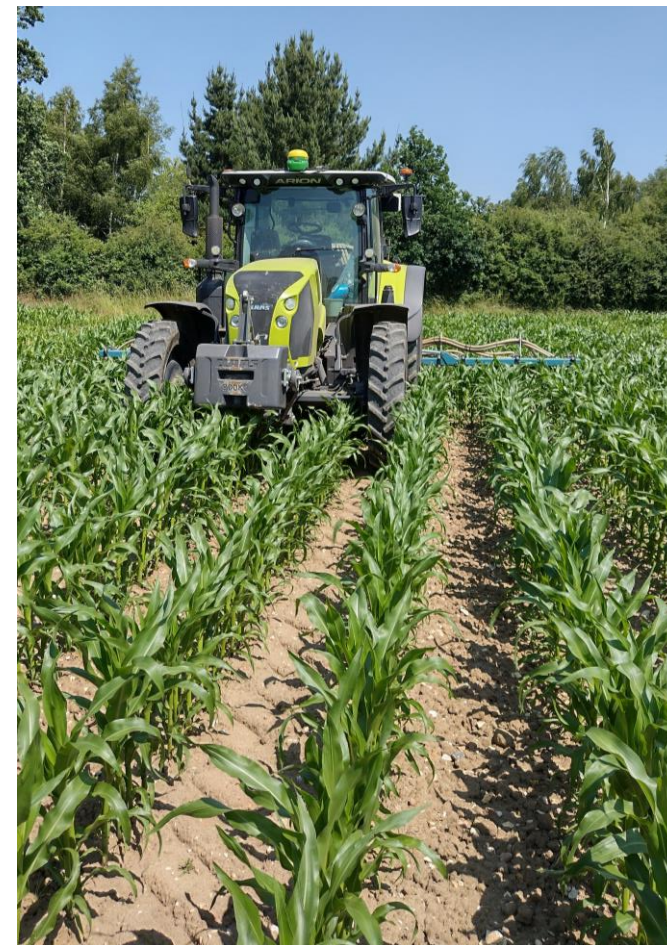
Thank you for your time



Undersowing session



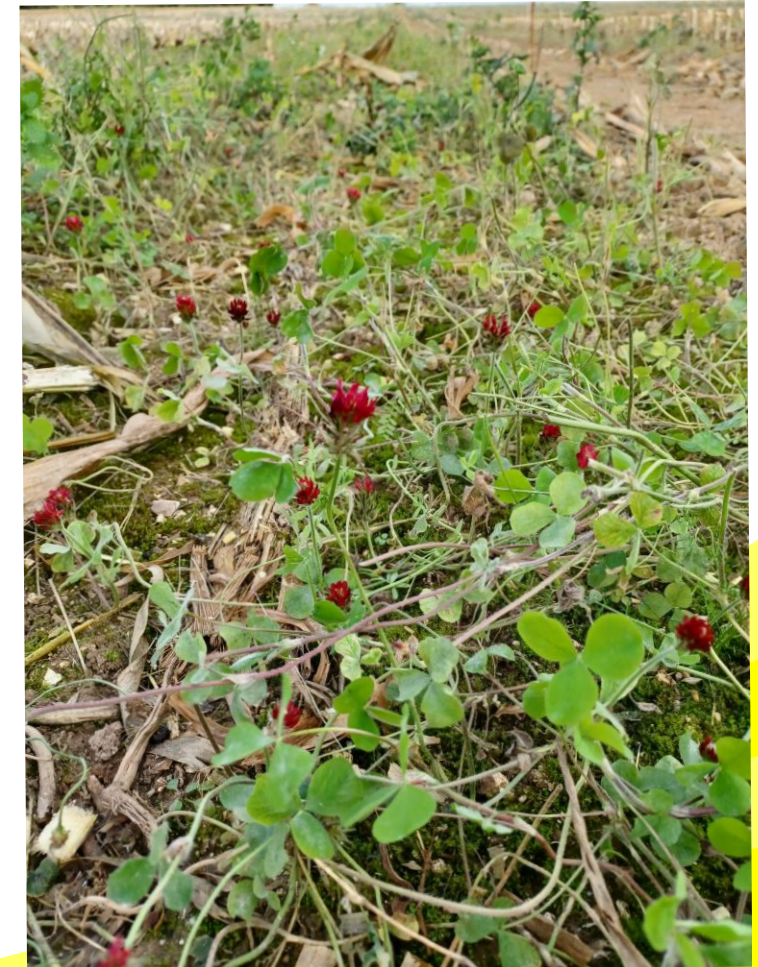
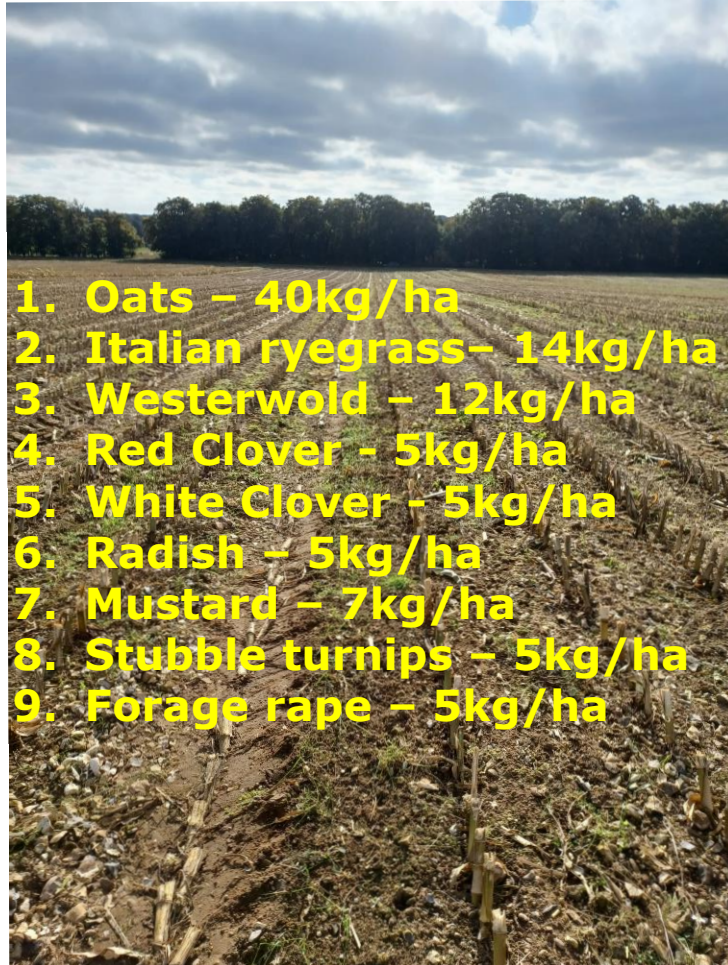
Undersowing maize 2023 trials



Undersowing without grass trial 2023



Rationale – Can farmers who are concerned with wire worm or introducing grass still undersow maize without using a grass species.



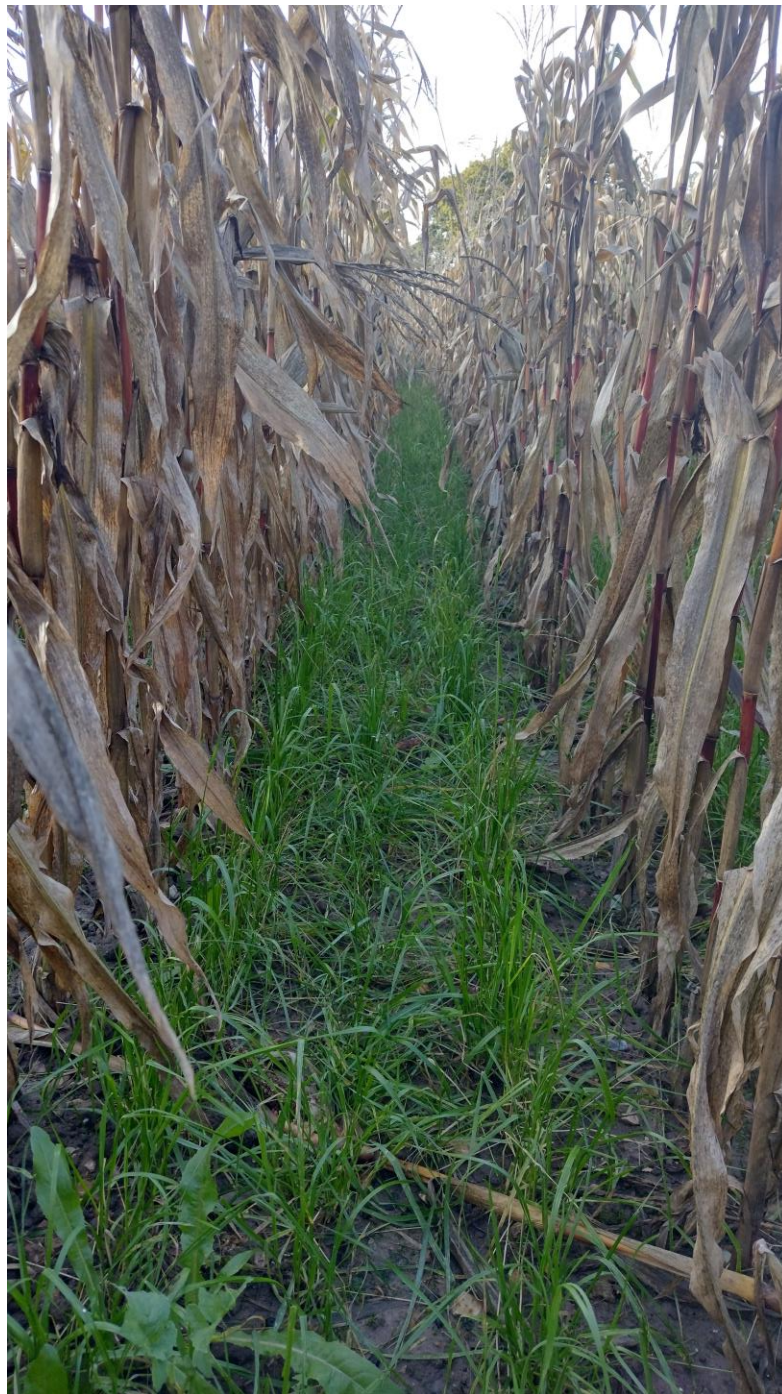
Talking points



Conclusion

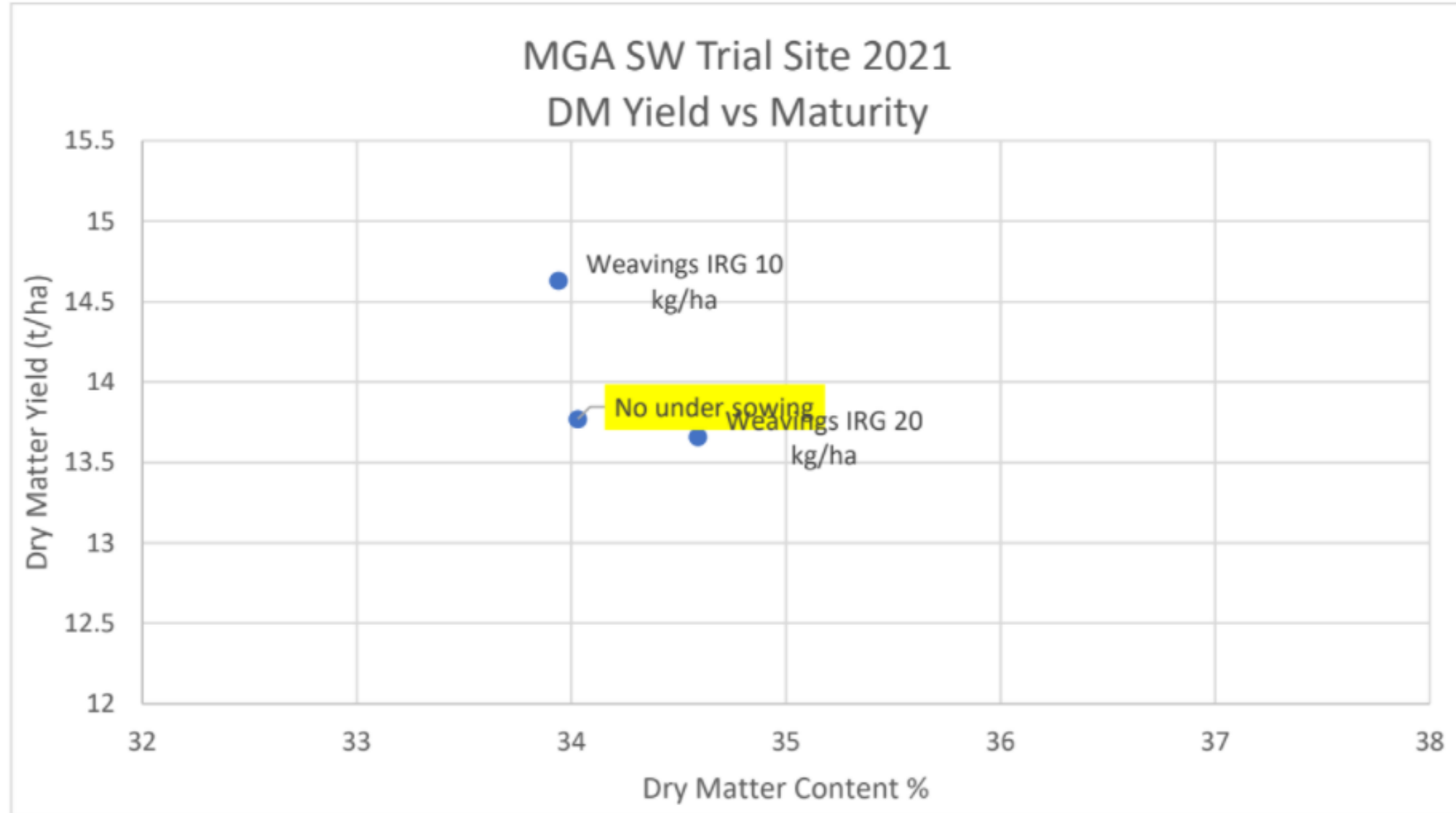
- Italian Ryegrass and Westerwold grew very well
 - Forage rape provided decent ground cover
 - Clover mixed with a grass provided an added benefit
-
- Everything else grew but did not survive....







Yield impact from undersowing at 4-6 leaf stage



Undersowing trial at the MGA Southwest site

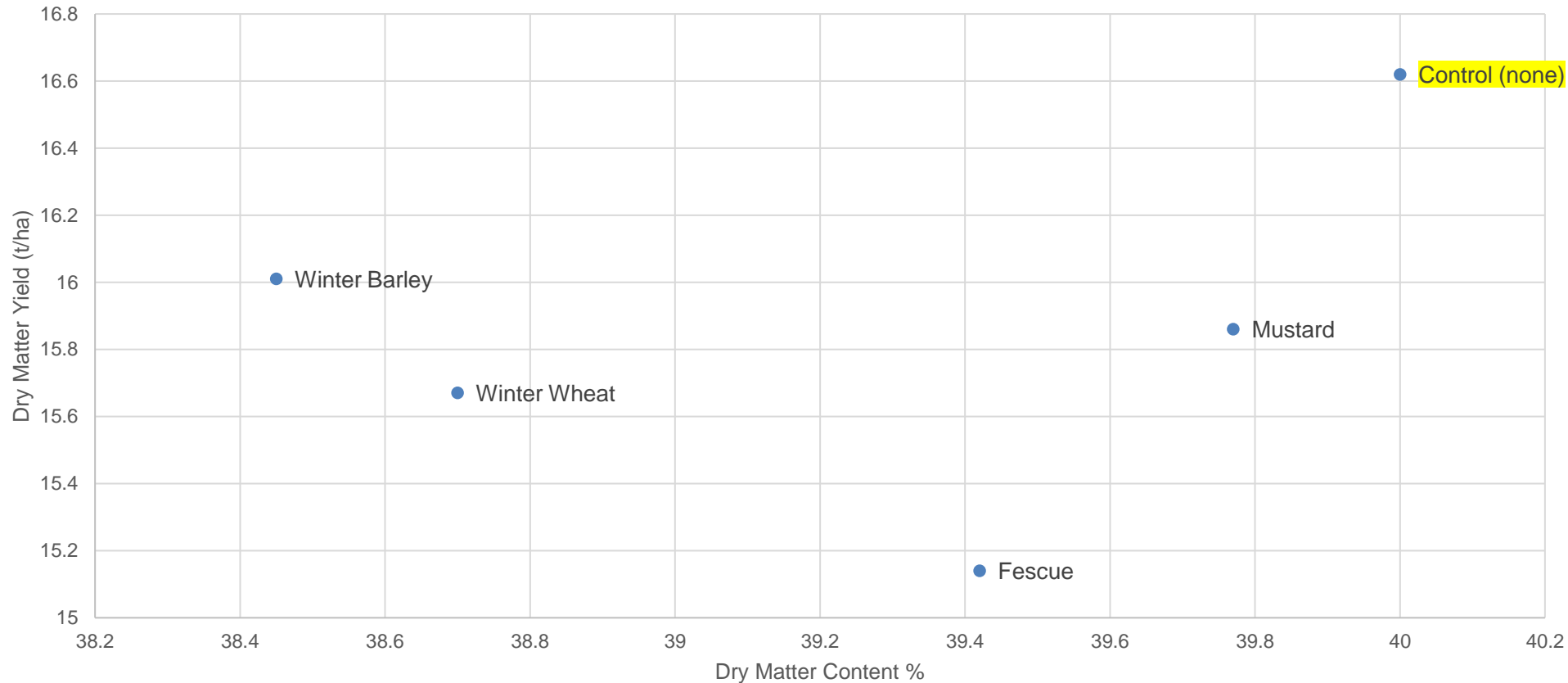
The site looked at:

- Winter Wheat
- Winter Barley
- Fescue grass
- Mustard

<i>Treatment</i>	<i>Starch %</i>	<i>ME</i>	<i>Cell wall D</i>	<i>Starch Yield</i>	<i>ME Yield</i>
Fescue	27.91	12.05	58.50	4.23	182.43
Mustard	29.56	11.82	58.00	4.69	187.41
Winter Barley	31.12	11.60	57.20	4.98	185.72
Winter Wheat	29.85	11.78	57.80	4.68	184.57
Control (none)	31.66	11.50	56.70	5.26	191.13



MGA SW Trial site 2023
Maize undersowing DM% vs DM Yield



There is a significant difference in yield between the control and plots undersown with Fescue.

- The fescue did not establish well.
- Maize yield in one of the three, fescue undersown replicates, was lower than the other two and could have driven overall treatment results below significance threshold.

The lack of rain for a month post maize drilling reduced the development of maize between drilling and undersowing - the fescue may have put pressure on the maize crop.



Variety choice and seed rates

Seed rate is not critical provided it is not too high. The seed rate should be in the region of 8 – 15 kg/ha (depending on soil type and conditions)

- In low, non-grass weed situations, consider slower-growing grasses, which can be drilled into maize at the 4-5 leaf stage.
- In high weed situations, where two post-emergence treatments may be required, delay drilling until the maize is at 7-8 leaves. Faster-growing grasses will be required.

Example mixes:

- Italian Rye Grass
- Tall fescue
- IRG & Berseem and Crimson Clover
- Westerwold
- Westerwold (50%) & IRG (50%) mix
- Other options - such as Rye & Vetch



Maize weed control

- ✓ It is best not to undersow fields known to have problem grass weeds that may require nicosulfuron based herbicides
- ✓ The general principle is to undertake maize weed control as if the companion crop is not present.
- ✓ Early treatment of small weeds will allow reduced chemical rates and less risk of undersown crops being impacted
- ✓ Leave a 2-week gap from the post-em spray if possible
- ✓ Using pendimethalin is generally safe but do leave a 6-week gap before undersowing

The key rule for undersown maize is the performance of the main crop should not be compromised in any way by the undersown crop

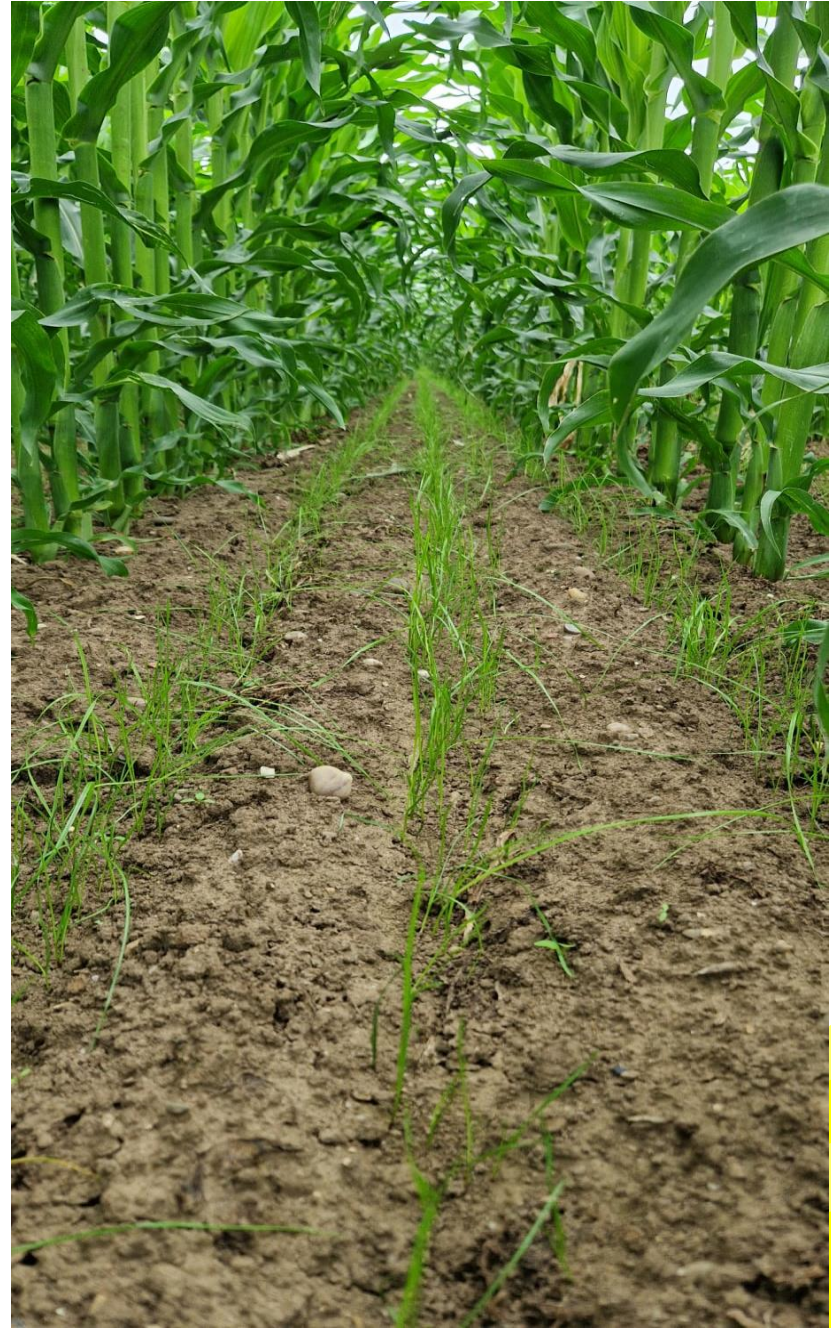


First time undersower story.....



John Jackson







Undersowing summary for success

- ❖ Multiple options are available
- ❖ Is moisture dependent to be a success!
- ❖ Keep mixtures simple
- ❖ Drill seeds between maize rows rather than broadcast
- ❖ Maize is the primary crop so drill at the 4-8 leaf stage
- ❖ Be aware of herbicide applications

Water authorities or local river trusts may offer support payments that cover the cost of seed, drilling or both. Plus SFI option.





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Thank you for your time