SPot Results Day 2020

Residual and Contact Herbicide Trials

Joe Martin & Graham Tomalin

CEREALS & OILSEEDS

Content

- Aims
- Replicated trials – residual herbicides
- Demonstration trials – contact herbicide

Aims

Residual Herbicides –

- To study the effect of aclonifen in combination with a range of other available residual herbicides
- Observe any potential phytotoxicity effects of the residuals used

Contact Herbicides –

- To observed the effects and safety of timing of applications of alternative contact herbicides (as a replacement for diquat) for early post-emergence use

Residual Herbicides – Sites

- SPot N
- Varieties – Maris Piper and Sunita
- Mechanically planted 15th April 2019
- Soil type – Sandy Loam
- 4 replicates

- SPot W
- Variety – Maris Piper
- Mechanically planted 7th May 2019
- Soil Type – Clay Loam
- 4 replicates

Residual Herbicides – Treatments

- **SPot N**
- Application 30th April
- Pre-emergence of the crop and prior to cracking (BBCH 03)

- **SPot W**
- Application 16th May
- Pre-emergence of the crop and prior to cracking (BBCH 05-08)

Treatment number	Treatment
1	Untreated Check
2	Emerger 1.75 L/ha
3	Shotput 0.5 kg/ha; Praxim 2.5 L/ha
4	Emerger 1.75 L/ha; Shotput 0.5 kg/ha
5	Emerger 1.75 L/ha; Praxim 2.5 L/ha
6	Emerger 1.75 L/ha; Stomp Aqua 2.0 L/ha
7	Emerger 1.75 L/ha; Gamit 36 CS 0.15 L/ha
8	Emerger 1.75 L/ha; Praxim 2.5 L/ha; Defy 3.0 L/ha

AHDB SPot Farm East Residual Herbicide Demonstration

Phytotoxicity

Application of the residual active substances can lead to phytotoxic effects particularly

- Metribuzin – veinal yellowing/chlorosis – stunting – varietal variation *(label "do not use Shoput on sands")*

VCS Potatoes Ltd

AHDB SPot Farm East Residual Herbicide Demonstration

Phytotoxicity

Application of the residual active substances can lead to phytotoxic effects particularly

- Clomazone – chlorosis- whitening – varietal variation *(label " do not use Gamit 36EC on sands or very light soils"*

VCS Potatoes Ltd

AHDB SPot Farm East Residual Herbicide Demonstration

Phytotoxicity

Application of the residual active substances can lead to phytotoxic effects particularly

- Pendimethalin – slight yellowing of leat margins, leaf distortions *(label Stomp Aqua "on stony or gravely soils there is a risk of crop damage especially if heavy rain falls soon after application")*

VCS Potatoes Ltd

Residual Herbicides – Weed levels and assessment timing

SPot N

- Knotgrass, oilseed rape and bindweed
- Assessment 55DAA (24th June)

Residual Herbicides – Weed levels and assessment timing

SPot W

- very low numbers emerged and little weed burden – Fat-hen, mayweed, groundsel, nettle
- Assessments 32DAA (17 June) and 75DAA (30 July)

Residual Herbicides – Results

- **Phytoxicity –** No crop damage
- **Weed control –**
- **SPot N**
- Some weed control observed by aclonifen alone, improved when tank mixed and effective as a partner

- **SPot W**
- Due to the low weed burden good control observed across all treatments

Residual Herbicides – Results Cont'd

Residual Herbicides – Results Cont'd

Residual Herbicides – Results Cont'd

Residual Herbicides – Results Cont'd

- Full control of oilseed rape from all treatments
- Emerger achieved partial control of field bindweed and knotgrass although not commercially acceptable
- In tank mix Emerger achieved excellent control Growers on site felt the best control included Treatment 3

Trt	Product	Weed	Vol OSR	Field bindweed	Knotgrass
		U/T level (m^2)	6	5	7.3
		% control			
		Rate (/ha)			
1	Untreated	N/A	0	0	0
2	Emerger	1.75l	100 a	75.0 b	74.6 b
3	Shotput + Praxim	0.5kg + 2.5 l	100 a	80.0 ab	96.9 a
4	Emerger + Shotput	1.75l + 0.5kg	100 a	90.0 ab	96.9 a
5	Emerger + Praxim	1.75l + 2.5l	100 a	95.0 a	95.8 a
6	Emerger + Stomp Aqua	1.75l + 2l	100 a	100 a	100 a
7	Emerger + Gamit 36 CS	1.75l + 0.15l	100 a	100 a	100 a
8	Emerger + Praxim + Defy	1.75l + 2.5l + 3l	100 a	100 a	100 a

Residual Herbicides – Costs

Trt. N°	Product / Formulation	Rate of product/ha	Dosage a.i. in g/ha	cost per ha	cost per ha (total)	cost per acre	cost per acre (total)
1	Untreated	-	-				
2	Emerger	1.75 L	1050	£ 31.50	£ 31.50	£ 12.75	£ 12.75
3	Shotput	0.5 Kg	350	£ 14.40	£ 78.40	£ 5.83	£ 31.73
	Praxim	2.5 L	1250	£ 64.00		£ 25.90	
4	Emerger	1.75 L	1050	£ 31.50	£ 45.90	£ 12.75	£ 18.58
	Shotput	0.5 Kg	350	£ 14.40		£ 5.83	
5	Emerger	1.75 L	1050	£ 31.50	£ 95.50	£ 12.75	£ 38.65
	Praxim	2.5 L	1250	£ 64.00		£ 25.90	
6	Emerger	1.75 L	1050	£ 31.50	£ 49.16	£ 12.75	£ 19.90
	Stomp Aqua	2 L	910	£ 17.66		£ 7.15	
7	Emerger	1.75 L	1050	£ 31.50	£ 48.81	£ 12.75	£ 19.75
	Gamit 36 CS	0.15 L	54	£ 17.31		£ 7.00	
8	Emerger	1.75 L	1050	£ 31.50	£ 117.40	£ 12.75	£ 47.51
	Praxim	2.5 L	1250	£ 64.00		£ 25.90	
	Defy	3 L	2400	£ 21.90		£ 8.86	

Based on data supplied by Eurofins and Agrii

Residual Herbicides – Summary Trials 2019

- **No crop damage observed from pre-emergence applications**
- **Emerger (aclonifen) gave good levels of control which were improved when tank mixed showing it to be an effective partner**
- **Costs of herbicide mixes and weed burdens at each site need to be considered when choosing products for weed control**

Residual Herbicides Spot East 2016-2018

Residual Herbicides – Conclusions

- Emerger(aclonifen) – good activity Fat Hen / S.nettle / Mayweed /charlock /AMG but requires application within mixes (excellent crop safety pre emergence)
- Praxim(metabromuron) – good activity B.bindweed/Knotgrass/S.nettle but requires application within mixes (excellent crop safety pre emergence)
- Shotput (metribuzin) – most cost effective broad spectrum control(not cleavers) however rate dependant on soil types and varietal sensitivity
- Stomp Aqua- cost effective broad spectrum(not groundsel/charlock), poor in dry conditions, apply 7 days pre emergence and avoid application on sands
- Defy – cost effective cleaver control – requires application within mixes
- Gamit 36CS – cost effective cleaver control – varietal sensitivity

3 Way mixes provide broader weed spectrum control

VCS Potatoes Ltd

Contact Herbicides – Sites

- SPot SW
- Varieties – Georgina and Lanorma
- Hand planted 15th April 2019

- SPot E
- Varieties – Nectar, Maris Piper, Jelly, Sovereign
- Hand planted 16th April 2019

Contact Herbicides – Treatments

Treatment number	Treatment		Appl'n timing
1	Retro 4.0L	Praxim 4.0L Shotput 0.35Kg Gamit 36CS 0.15L Emerger 1.75L	A
2	Shark 0.333L		A
3	Retro 4.0L		B
4	Shark 0.333L		B
5	Retro 4.0L		C
6	Shark 0.333L		C
7	Handweeded Control		
8	Untreated Control		

Contact Herbicides – Application timings

Site	Variety	Timing	Crop GS	Date
SPot SW	Georgina	A – Pre emergence	Cracking of ridges BBCH 08	23 May
		B – 10% emergence	BBCH 09	3 June
		C – 50% emergence	BBCH 09-10	5 Jun
	Lanorma	A – Pre emergence	Cracking of ridges BBCH 08	23 May
		B – 10% emergence	BBCH 08-10	7 Jun
		C – 50% emergence	BBCH 09-10	10 Jun

Site	Variety	Timing	Crop GS	Date
SPot E	Nectar, Maris Piper, Jelly, Sovereign	A – Pre emergence	Cracking of ridges BBCH 07	3 May
		B – 10% emergence	BBCH 09-11	15 May
		C – 50% emergence	BBCH 10-12	18 May

Contact Herbicides – Weed levels and assessment timings

- **SPot SW**
- Wild oat, red dead nettle, common groundsel, ivy-leaved speedwell and vol oilseed rape
- Assessments 19, 26, 34, 47 and 54DAC (24 June, 01, 09, 22 and 29 July)

- **SPot E**
- Fat-hen, fumitory, common groundsel, nettle
- Assessments 6, 13, 19, 32 and 41DAC (24 and 31 May, 6, 19 and 28 June)

U/T East

Contact Herbicides – Results SPot E

Variety	Jelly		Maris Piper		Nectar		Sovereign	
Assessment date	24th May	31st May	24th May	31st May	24th May	31st May	24th May	31st May
Retro (pre)	10	5	0	0	2	0	0	5
Shark (pre)	10	10	0	0	5	0	0	5
Retro (10%)	10	20	0	5	10	5	2	10
Shark (10%)	10	30	2	5	10	5	4	5
Retro (50%	30	50	15	15	30	15	25	40
Shark (50%)	40	60	20	20	30	20	25	50
Handweeded	0	0	0	0	0	0	0	0
Untreated	0	0	0	0	0	0	0	0

The highest levels of phytotoxicity were seen at the 50% application timings.

Overall the treatments with Shark at the 50% application timings showed slightly more damage than the same timing with Retro.

The varieties varied in their levels of damage, with Jelly being the worst affected (maximum 60% damage) and Maris Piper being the least affected (maximum 20% damage).

No further symptoms on crops were visible by 19 days post application.

Contact Herbicides – Results SPot E

Crop vigour

- Overall most severe symptoms seen at the 13 day assessment, at 10% and 50% emergence application timing, with 50% - 70% reduction in crop vigour.
- In general the application at the 50% emergence timing with Shark were the worst affected.
- By the 32 day assessment, only minor differences were apparent across the 4 varieties in the plots treated at the final application timing with Shark.
- Symptoms gradually declined and by the final assessment no differences in crop vigour were observed across any varieties or treatments.
- Jelly showed the most severe symptoms, with a 50% reduction in crop vigour at the final application timing with Shark. Maris Piper was the least affected variety with 40% reduction at the final application timing with Shark.

Pre-em

10%

50%

Contact Herbicides – Results SPot SW

Phytotoxicity

- Georgina showed very little phytotoxic symptoms, with the only minor damage seen at 14 days after application, in the plots treated with Retro at 50% emergence. No other phytotoxic symptoms observed.

- Lanorma was more affected, with chlorotic symptoms seen at the 14 day assessment in the plots treated with Retro at both the 10% emergence (10% damage) and 50% emergence (40% damage) timings. Severe symptoms were also seen in the treatment with Shark at the 50% emergence timing (75% damage). One week later, symptoms were only visible in the plot treated with Retro at 50% timing, and after this no further damage was seen.

Contact Herbicides – Results SPot SW

Crop vigour

- Clear differences in crop vigour were observed across all plots of both Georgina and Lanorma treated at 10% and 50% emergence, for the duration of the trial.
- The later application timings (10% and 50% emergence) caused the greatest differences when compared to the untreated control.
- Georgina was less affected, but the 50% emergence application timing with Shark was still the worst affected, with a 55% reduction in vigour compared to a 40% reduction in crop vigour at the latest timings with Retro.
- As with Lanorma, symptoms gradually declined but a 20% reduction in crop vigour was still observed at the final assessment timing.

Contact Herbicides – Results SPot SW

Field digs

- At the demonstration day in August, two plants from each plot were dug to see if there were differences in the number or size of tubers.

- Differences were seen in tuber formation, and growers felt that the 50% emergence application was too late and could be damaging to the crop and yield quality.

Contact Herbicides – Results SPot SW

Pre-em Diquat

Pre-em Shark

10% Diquat

10% Shark

Contact Herbicides – Results SPot SW

50%
Diquat

50%
Shark

Contact Herbicides – Results SPot SW

50%
Diquat

50%
Shark

Contact Herbicides – Results SPot SW

Pre-Emergence
Shark

50%
Shark

Contact Herbicides – Results SPot SW

Contact Herbicides – Summary

Shark not direct replacement for diquat – more severe scorch will delay crop development (Gozai) – different weed spectrum to Retro

Need to be careful with timings, difference between 10% emergence and 50% emergence can be a matter of days, and makes a huge difference to crop.

Also damage varies depends on variety??? –(emergence/sensitivity to residual)

Extra Stress – effect on disease

Shark label only to 10% emergence -Always use recommended label rates.

Trial Reports and Summary

Thanks Questions?

- Contact
- Joe.martin@ahdb.org.uk


‘Inspiring our farmers, growers and industry to succeed in a rapidly changing world’