Critical Time for Weed Removal with Cover Crop and Premergence herbicides in Soybeans

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Objective

The objective of this study is to investigate and compare the best timing for weed removal in soybean using two different weed management approaches, cover crops and pre-emergence herbicide.

Methods

Plant material

The study would be conducted at Emile A. Lods Agronomy Research Centre. The study is arranged in a split plot design. The main plot are weed management practices, including cover crop, pre-emergence (PRE) herbicide and no management. The split plots are timing for weed removal at different soybean stages: VE, V2, V4, V6, R2, R5 and harvest. Weed removal is performed with post-emergence herbicide application and hoeing. The experimental unit width is 3m (four soybean rows) and length is 7m. There will be three blocks. The cereal rye cover crop will be drilled in the fall of 2023 and 2024. Soybean planting at 75 cm width will occur in June of 2024 and 2025. Tillage will be performed prior to cover crop and soybean planting.

Inputs

Input[a]	Product[b]	Rate	Type	Timing
Cereal rye	TBD	67 kg/ha	Drill	Fall
Soybean	TBD	350,000 kg/ha	Planter	June
Fertilizer	TBD	TDB	Broadcast	Fall/Spring
Herbicide	Dual II Magnum	l/ha	Pre-emergence	Up to 3 days after planting
	Roundup	3 l/ha	Post-emergence	At weed removal timing

[a]Inputs will be based on soil type and local recommendations.

Input[a]	Product[b]	Rate	Type	Timing

[b]TDB, to be decided.

Treatment labels

Management	Timing	Block 1	Block 2	Block 3
Untreated	V0	101	204	306
Untreated	V2	102	207	302
Untreated	V4	103	206	305
Untreated	V6	104	203	307
Untreated	R2	105	201	303
Untreated	R5	106	205	304
Untreated	Harvest	107	205	301
Cover crop	V0	108	213	304
Cover crop	V2	109	214	302
Cover crop	V4	110	210	305
Cover crop	V6	111	203	306
Cover crop	R2	112	211	303
Cover crop	R5	113	212	301
Cover crop	Harvest	114	208	301
PRE	V0	101	115	316
PRE	V2	102	116	321
PRE	V4	103	117	320
PRE	V6	104	118	315
PRE	R2	105	119	319
PRE	R5	106	120	317
PRE	Harvest	121	205	318

Trial map

The study area is 21 m by 63 m plus borders.

Block	1	2	3	4	5	6	7
Block 3	315	316	317	318	319	320	321
	308	309	310	311	312	313	314
	301	302	303	304	305	306	307
Block 2	215	216	217	218	219	220	221
	208	209	210	211	212	213	214
	201	202	203	204	205	206	207
Block 1	115	116	117	118	119	120	121
	108	109	110	111	112	113	114
	101	102	103	104	105	106	107

Data collection

Data	Procedure[a]
Cereal rye biomass	Cover crop biomass prior to termination
Weed ID	Weed ID at each removal timing
Weed height	Weed height at each removal timing
Soybean height	5 randomly selected soybean plants at each removal timing
Weed density	Weed density at each removal timing
Weed biomass	Weed biomass at each removal timing
Soybean yield	Soybean yield at 13% moisture

[a]Weed density and biomass collected using a quadrat arbitrarialy placed in the center of two soybean rows

Harvest

Soybean harvest performed at 13% moisture by harvesting the two center rows using a plot harvester.

Timeline

Year 1

This is a tentative timeline for year 1, including the major managament practices.

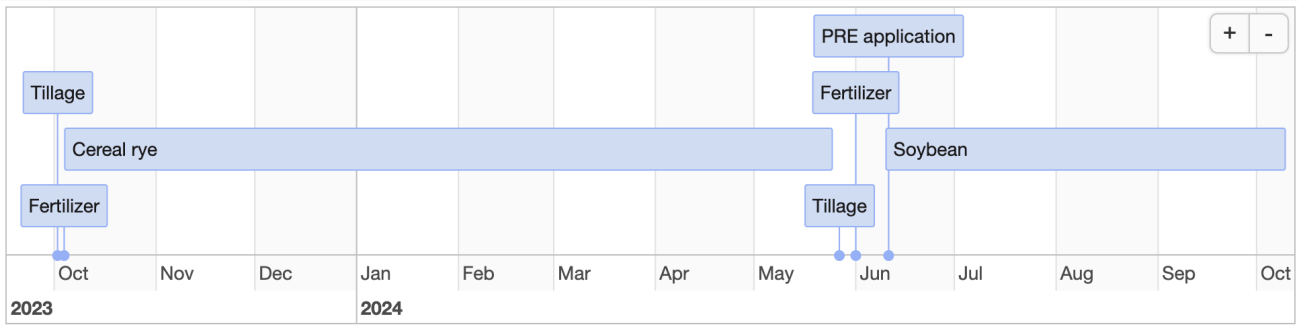

Figure 1: Timeline attempt year 1

Year 2

This is a tentative timeline for year 2, including the major managament practices.

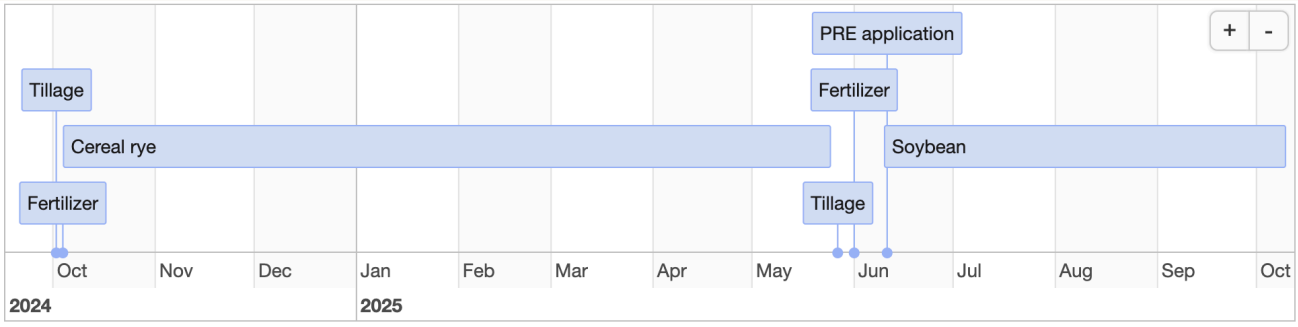

Figure 2: Timeline attempt year 2