

PROJECT DESCRIPTION NO. 1

PERFORMANCE OF HERBICIDES, PRE AND POSTEMERGENCE APPLICATIONS

The basis of chemical weed control is to selectively direct solar energy into desirable plant growth and away from weedy species. Herbicides can be applied to freshly plowed soil (preemergence) to control weeds germinating from seeds and emerging from the soil. Chemicals applied to actively growing plants (postemergence) can selectively kill weeds when crop plants are resistant to the chemicals or herbicide sprays are prevented from contacting desirable plants (directed postemergence).

PURPOSE: To demonstrate pre and postemergence herbicide performance on several indicator plant species and weeds.

PROCEDURE:

1. **POST EMERGENCE TEST PLOTS** will be planted 3 weeks before herbicide application. Prior to rototilling apply 4.0 pounds of 16-16-16 fertilizer evenly across the entire plot area. After rototilling rake plots to smooth the soil surface. Stake out 7 plots 6 ft. wide and 7 ft. long, total plot area will be 42 ft. X 7 ft. At the ends of the plots place stakes at 1, 3 and 5 ft marks starting from the bottom of the plots as you face the glasshouse. Use a string to make a line connecting the stakes so that a long straight furrow can be pulled with hoe on one side of the string. It is **very important** that the rows have uniform depth across the entire length so that seed germination is highly uniform. Place sorghum x Sudan grass and sun hemp seed into shallow furrows so that seeds are spaced every 2 inches, the oil seed mustard will be seeded heavily to form a long solid row. Seed depth should be 4 times the widest part of the seed. After seeding, roll plots to provide uniform soil/seed contact. Herbicides will be applied by Magoon Staff with a backpack sprayer to living plants at 21 days after planting. Describe injury symptoms and visually estimate the % of foliage showing injury or abnormal growth at 2, 7, 14 and 21 days after herbicide application. It is very important to follow the time schedule for recording injury ratings. Your final reports must include a description of how injury symptoms **changed over time**. Take detailed notes of each indicator species so that your reports are complete; your grades will depend on thoroughness of your observations.
2. **PREEMERGENCE TEST PLOTS** will be planted the day of spray application and 3 weeks after the post experiment. For this section apply 4.0 pounds of 16-16-16 fertilizer evenly across the entire plot area prior to rototilling. Stake out 7 plots 6 ft. wide and 7 ft. long, total plot area will be 42 ft. X 6 ft. At the ends of the plots place stakes at 1, 3 and 5 ft marks starting from the bottom of the plots as you face the glasshouse. Students will plant the indicator crops in a single row 42 feet long. After seeding rows, cover them and apply seeds of annual ryegrass. Annual ryegrass will be seeded over the entire plot area (7 ft. X 42 ft. = 294 ft.²) to simulate a grassy weed. Broadcast 1.3 lb. of annual ryegrass (200 lb/a) to the entire preemergence test plots and lightly rake in. Roll plots after annual rye is raked in. Herbicides will be applied to marked plots. Observations on herbicide performance should be taken at 14 and 21 days after application. Data forms will be provided. At each evaluation date, look at the untreated plots and then visually estimate the % reduction in stand and % of maximum vigor of the indicator plants. Be sure to take detailed descriptions of abnormal growth of each indicator crop. The more descriptive your notes the easier it will be to write-up the lab reports near the end of the semester.

IMPORTANT: When making your ratings of treated plots, make sure your comparisons are based on the control or untreated plot. Take appropriate notes on untreated plots and note if spray drift or other unknown factors have affected them. In your final report be sure to describe what the values in your rating system mean. Provide a description of what the low and high ends of your scale mean. Evaluate the impact of herbicides to weeds and indicator crops.

POSTEMERGENCE HERBICIDE TREATMENTS

(Sprayer GPA = 40)

Treatment #	Herbicide	ml for 3 liter of finished mix	Rate lb ai/a	Trade Names
1	oxyflourfen	4.7	.25	GoalTender 4 SS
2	paraquat	22.5	.75	Gramoxone Extra
3	glyphosate	18.8	1.00	Round-Up 4E
4	triclopyr	25.0	1.00	Element 3A
5	fluazifop-p	14.1	.375	Fusilade DX (2 EC)
6	untreated		-	

Indicator Plants	POSTMERGENCE HERBICIDE PLOT PLAN						
	1	2	6	3	4	6	5
Sun hemp							
Sorghum x Sudan Grass							
Oil seed mustard							

Dates ratings	POSTMERGENCE RATING FORM - % Injury/Abnormal growth						
Indicator Plants	1	2	6	3	4	6	5
Sun hemp							
2 days							
7 days							
14 days							
21-days							
S X S G							
2 days							
7-days							
14 days							
21 days							
Mustard							
2 days							
7-days							
14 days							
21 days							

PREEMERGENCE HERBICIDE TREATMENTS

Treatment #	Herbicide	ml for 3 liters or Grams for	Rate lb ai/a	Trade Names
1	oryzalin	37.5 ml	2.0	Surflan 4AS
2	oxyflourfen	4.7 ml	.25	Goal 4XSS
3	diuron	9.3 ml	.50	Direx 4L
4	metribuzin	5.7 grams	.40	Sencor DF 75% Dry Flowable
5	oxadiazon	66 grams	1.5	Ronstar 2G
6	untreated	-	-	

Indicator Plants	PREEMERGENCE HERBICIDE PLOT PLAN						
	1	2	6	3	4	6	5
Sun hemp							
S x SG							
Oil seed Mustard							

Data Sheet

Times for ratings	PREEMERGENCE RATING FORM-% stand reduction (%)						
Indicator Plants	1	2	5	3	4	5	6
Sun hemp							
14 days							
21 days							
S X SG							
14 days							
21 days							
Oil Seed Mustard							
14 days							
21 days							

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5	oxadiazon	66 grams	1.5	Ronstar 2G
6	untreated	-	-	

Indicator Plants	PREMERGENCE HERBICIDE PLOT PLAN						
	1	2	6	3	4	6	5
Sun hemp							
S x SG							
Oil seed Mustard							

Times for ratings	PREMERGENCE RATING FORM-% of maximum vigor (%)						
Indicator Plants	1	2	5	3	4	5	6
Sun hemp							
14 days							
21 days							
S X SG							
14 days							
21 days							
Oil seed mustard							
14 days							
21 days							

PROCEDURES AND ACTIVITIES FOR HERBICIDE PERFORMANCE PROJECT # 1.

LAB #	DATE	
1	8/24	
2	8/31	Rototill and plant indicator crops for postemergence herbicide performance. Cover with bird netting. Whole class participates.
3	9/07	
4	9/14	
5	9/21	1. Plant indicator for preemergence herbicides. 2. Herbicides applied to pre and post treatments.
	9/23	1. Record 2-day injury ratings on postemergence treatments.
6	09/28	1. Record 7-day injury ratings on postemergence treatments.
7	10/05	1. Record 14-day injury ratings on postemergence treatments.
8	10/12	1. Record 21-day injury ratings on pre and postemergence treatments.
9	10/19	
10	10/26	1. Record 35-day injury ratings on preemergence treatments.
11	11/02	
12	11/09	
13	11/16	
14	11/23	
15	11/30	
16	12/07	Written reports due
17	12/12	Lab final