

PROJECT TITLE, JUSTIFICATION AND OBJECTIVES:

Performance of Pre and Early-Post-emergence Herbicide on Hemp (industrial). The IR-4 received requests for the registration of herbicides for weed control in industrial hemp. This study is designed to collect efficacy and crop safety data for certain herbicide products. Adherence to Good Laboratory Practices (GLPs) is not required for trials conducted under this research plan.

IR-4 PRODUCT PERFORMANCE RESEARCH COORDINATOR:

Consult with the Research Coordinator listed below regarding desired changes in this research plan prior to occurrence.

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TEST SITE, TEST SUBSTANCES AND STATISTICAL ANALYSIS:

Field trials should be conducted at appropriate sites to determine the performance of herbicides when applied to industrial hemp. Evaluate the test materials listed below. Do not use old products for trial conducted under this research plan. If needed, the IR-4 Research Coordinator will arrange for fresh test substances to be delivered. If unsure, contact the IR-4 Research Coordinator for guidance.

Follow local agricultural practices for the production of industrial hemp including fertilization, irrigation, if necessary and available, and other practices that ensure good crop production. Use a locally-grown, commercial variety of industrial hemp.

Each test site will include at least three replicates of each treatment, arranged in an appropriate statistical design. The individual plots should be large enough to permit accurate application of the test substances in a manner that represents the major application technique that will be used commercially. Conduct appropriate statistical analysis to determine if significant differences exist between treatments. Statistical analysis from commonly used agricultural data programs, such as Agricultural Research Manager (ARM), is acceptable.

TREATMENTS AND TIMING:

Use application equipment that will provide uniform application of the test substance and simulates the intended commercial application technique as specified below. To ensure accurate delivery, calibrate test application equipment prior to application of the test substance(s).

A. Pre-emergence Herbicide:

Trt#	Active ingredient(s)	Product(s)	Target Rate of active ingredient(s)	Target Rate of formulated product*	Application Placement & Timing	Spray Volume Range**
01	Weed Free	N/A	N/A	N/A	N/A	N/A
02	Weedy	N/A	N/A	N/A	N/A	N/A
03	CLOMAZONE (1 X)	COMMAND 3ME	0.25 lbs ai/a	10.7 oz/a	Pre-emergence, broadcast	10-40 GPA
04	CLOMAZONE (2X)	COMMAND 3ME	0.5 lbs ai/a	21.4 oz/a	Pre-emergence, broadcast	10-40 GPA
05	SULFENTRAZONE (1X)	Spartan 4F	0.14 lbs ai/a	4.5 fl oz/a	Pre-emergence, broadcast	10-40 GPA
06	SULFENTRAZONE (2X)	Spartan 4F	0.28 lbs ai/a	9.0 fl oz/a	Pre-emergence, broadcast	10-40 GPA
07	FLUMIOXAZIN 1X	Chateau Herbicide	0.188 lbs ai/a	6 oz/a	Pre-emergence, broadcast	10-40 GPA
08	FLUMIOXAZIN 2X	Chateau Herbicide	0.38 lbs ai/a	12 oz/a	Pre-emergence, broadcast	10-40 GPA



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09	PYROXASULFONE (1X)	Pyroxasulfone 85 WG	0.08 lbs ai/a	1.5 oz/a	Pre-emergence, broadcast	10-40 GPA
10	PYROXASULFONE (2X)	Pyroxasulfone 85 WG	0.16 lbs ai/a	3.0 oz/a	Pre-emergence, broadcast	10-40 GPA
11	s-METOLACHLOR	Dual Magnum	0.95 lb ai/a	1.0 pt/a	Pre-emergence, broadcast	10-40 GPA
12	s-METOLACHLOR	Dual Magnum	1.27 lb ai/a	1.33 pt/a	Pre-emergence, broadcast	10-40 GPA
13	s-METOLACHLOR	Dual Magnum	1.6 lb ai/a	1.67 pt/a	Pre-emergence, broadcast	10-40 GPA

*The nominal formulation concentration of the test substance will be used in calculating application rates.

**GPA=gallons per acre

ALL TREATMENTS: Make one broadcast application to the soil after seeding but prior to crop emergence.

Application Description: As listed above. Include a full description of the application method in the final report.

DATA COLLECTION:

Crop Injury: YES NO OPTIONAL

Crop injury data will be collected at 1, 7, 14, 28 and 42 days after crop emergence and at harvest. Specify the type of injury (stunting, stand loss, leaf burn, leaf cupping or twisting, chlorosis, etc.) and assess if this level of injury is commercially acceptable. Photo images of significant injury should be collected and included in the final report.

Weed Control: YES NO OPTIONAL

Weed control data will be collected at 1, 7, 14, 28 and 42 days after crop emergence and at harvest. Specify the weed(s) and the method used to evaluate the level of weed control.

Crop yield: YES NO OPTIONAL

Yield data will be collected and will include yield/acre and, if appropriate, grades (quality and/or size) of harvested products according to official standards. An explanation of the standards should be included in the final report.

B. Early post-emergence Herbicide:

Trt#	Active ingredient(s)	Products(s)	Target Rate of active ingredient(s)	Target Rate of formulated product*	Application Placement & Timing	Spray Volume Range**
01	Weed Free	N/A	N/A	N/A	N/A	N/A
02	Weedy	N/A	N/A	N/A	N/A	N/A
03	BROMOXYNIL (1X)	Maestro 4EC	0.25 lb ai/acre	8 fl oz/a	Early post-emergence, foliar, broadcast	10-40 GPA
04	BROMOXINIL (2X)	Maestro 4EC	0.5 lb ai/acre	16 oz/a	Early post-emergence, foliar, broadcast	10-40 GPA
05	CLETHODIM (1X)	Select Max	0.121 lbs ai/a	16 fl oz/a	Early post-emergence, foliar, broadcast	10-40 GPA



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06	CLETHODIM (2X)	Select Max	0.242 lbs ai/a	32 fl oz/a	Early post-emergence, foliar, broadcast	10-40 GPA
07	PYROXASULFONE (1X)	Pyroxasulfone 85WG	0.08 lbs ai/a	1.5 oz/a	Early post-emergence, foliar, broadcast	10-40 GPA
08	PYROXASULFONE (2X)	Pyroxasulfone 85WG	0.16 lbs ai/a	3.0 oz/a	Early post- foliar, broadcast	10-40 GPA

*The nominal formulation concentration of the test substance will be used in calculating application rates.

**GPA=gallons per acre

BROMOXYNIL APPLICATION: Make one early post-emergence, foliar application when hemp is 6 inches tall.

ALL TREATMENTS: Make one early post-emergence, foliar, broadcast, application, approximately 3 weeks after planting, and approximately when hemp is 10-12" tall, whichever occurs first.

Application Description: As listed above. Include a full description of the application method in the final report.

NOTE: If needed an adjuvant can be used at a rate recommended by the product label.

DATA COLLECTION:

Crop Injury: YES X NO _____ OPTIONAL _____

Crop injury data will be collected at 1, 7, 14, 28 and 42 days after the application and at harvest. Specify the type of injury (stunting, stand loss, leaf burn, leaf cupping or twisting, chlorosis, etc.) and assess if this level of injury is commercially acceptable. Photo images of significant injury should be collected and included in the final report.

Weed Control: YES X NO _____ OPTIONAL _____

Weed control data will be collected at 1, 7, 14, 28 and 42 days after application and at harvest. Specify the weed(s) and the method used to evaluate the level of weed control.

Crop yield: YES X NO _____ OPTIONAL _____

Yield data will be collected and will include yield/acre and, if appropriate, grades (quality and/or size) of harvested products according to official standards. An explanation of the standards should be included in the final report.

FINAL REPORT:

At trial completion, please submit a final report to the Research Coordinator and the appropriate ARS/Regional Field Coordinator listed below within 60 days of last data collection. This shall include but not be limited to:

- Data requirements listed above
- Test site and application information; including soil characteristics, crop maintenance pesticides and cultural practices, description of the application equipment, environmental conditions at applications(s), meteorological and irrigation records, and other pertinent information, such as photos of significant crop injury.

The final report will also include a thorough narrative that analyzes the results and evaluates the potential of the tested products for use in the tested crop(s). The final report may be in paper or electronic format.



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TRIAL SITE INFORMATION

Researcher	Field ID NO.	RFC
Dr. Angela R. Post, <u>MAILING</u> : NCSU Campus Box 7620, Raleigh, NC 27695-7620, (919)625-9850, Fax# (919)515-7959; e-mail: angela_post@ncsu.edu. <u>PACKAGES</u> : Campus Box 7620, 101 Derieux Place, Raleigh, NC 27695, (919)625-9850, FAX# 919-515-7959; e-mail: angela_post@ncsu.edu. <u>TEST SUBSTANCE SHIPPING</u> : Angela R. Post, NC State Univ, Central Receiving/NCSU, 3240 Ligon Street, Raleigh, NC 27695, (919)625-9850, FAX# 919-515-7959; e-mail: angela_post@ncsu.edu	P12340.19-NCP01 (pre-emergent) & P12340.19-NCP02 (post-emergent)	SOR
Tim Waters, Washington State University Extension; 1016 N. 4 th Avenue; Pasco, WA 99301; Ph: 509-545-3511; Fax: 509-545-2130; Cell: 509-554-0152; e-mail: twaters@wsu.edu	P12340.19.WAP02 (pre-emergent) & P12340.19-WAP03 (post-emergent)	WSR

RFC = Regional/ARS Field Coordinator

Location:

SOR: Janine Spies, Univ of Florida, 1642 SW 23rd Drive, Bldg 685, PO Box 110720, Gainesville, FL 32611-0720, Ph: 352-294-3991; Fax: 352-392-1988; e-mail: jrazze@ufl.edu

WSR: Dr. Michael Horak, Regional Field Coordinator, Western Region IR-4 Project, 4218 Meyer Hall, University of California-Davis, Davis, CA 95616 (530) 752-7634; Cell# 530-219-8466; e-mail: mjhorak@ucdavis.edu

Roger B Batts

Signature of IR-4 Product Performance Research Coordinator
Roger B Batts

1-29-19

Date