**Project Title:** **Efficacy and Crop Safety of MBI015 (*Burkholderia rinojensis*) on hops.**

**Personnel**

**Project Leader:**

Douglas B. Walsh, Professor of Entomology

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Cooperators:

Dan Groenendale, Field Research Director, WSU IAREC

Marcelo Moretti, Weed Scientist, Oregon State University

**Funding Requested: $15,000**

**Other Funding and Support:**

There is a proposal pending at IR-4 to support this project and BASF has agreed to support this efficacy and crop safety study at 50%. Funding rates for both sources TBD.

**Efficacy and Crop Safety of MBI015 (*Burkholderia rinojensis*) on hops.**

**Statement of Problem**

This proposal is being submitted as a place-holder as a potential funding request from the WA Hop Commission and the Hop Research Council. Presently, the hop industry under Weed Scientist Marcelo Moretti’s leadership has submitted a request for BASF’s herbicide MBI015 (*Burkholderia rinojensis*) for funding consideration by the IR-4 program’s *Integrated Solutions* program. This program funds potential projects that involve developing pest management solutions for difficult projects requiring additional research. This request will be considered by IR-4 at the upcoming Food Use Workshop in mid-September 2022. BASF, the registrant for MOI015 will require 4 efficacy and crop safety studies with MBI015 prior to approving registration of this product on hops. BASF has also agreed to fund 50% of the cost of these trials. We propose to complete 2 of these studies in 2 trials on hops at WSU IAREC. The first trial will be on our hop yard that is especially set up for herbicide efficacy and crop safety studies. This is a unique hop yard at IAREC that has 5 selections of hops across the yard. Plantings are

numbered from the south to the north. Within row the first 7 hills are Cascade, the next 20 hills are Chinook, then 20 hills of Willamette, 20 hills of Columbus, and then is 25 hills of Mt. Hood. The second site will be in our Tomahawk block. We will apply MBI015 at 3 rates. The first rate will be the proposed maximum label rate for MBI015 of 64 fluid oz per acre and the other 2 rates will be at the exaggerated rates of 2X and 4X this maximum rate of 64 fluid oz per acre. Applications will be under several timings including dormant and in-season applications. The protocol will be finalized in winter 2023. Evaluations for efficacy and potential phytotoxicity will be completed after MBI015 applications and yields will be calculated for each of the 6 varieties based on the herbicide regime of MBI015 each of these varieties has received. This will aid towards registering this alternative herbicide on hops.

**Justification and Importance of Proposed Research:** All pesticides registered on hops including herbicides are facing increased scrutiny among domestic and international markets. MBI015 is a potential herbicide for registration on US hops that may be exempt from tolerance domestically and received positively in target export markets since it is produced in a broth of *Burkholderia rinojensis.* The formulated product MBI015 has demonstrated herbicidal activity against a range of broadleaf weeds. This promising product has been submitted for funding consideration to the IR-4’s Integrated Solutions program. This proposal is being submitted to the WA Hop Commission and Hop Research Council proactively as a place-holder to ensure that some work gets completed with this product in Washington State in 2023.

**Objective(s):** To complete some of the efficacy and crop safety studies BASF will require to permit the registration on MBI015 on hops.

**Procedures/Methods to accomplish objectives:**

1. Location(s) where research will be conducted:

WSU Prosser, IAREC

2. Experimental procedures you propose to employ:

We propose to complete 2 of these studies in 2 trials on hops at WSU IAREC. The first trial will be on our hop yard that is especially set up for herbicide efficacy and crop safety studies. This is a unique hop yard at IAREC that has 5 selections of hops across the yard. Plantings are numbered from the south to the north. Within row the first 7 hills are Cascade, the next 20 hills are Chinook, then 20 hills of Willamette, 20 hills of Columbus, and then is 25 hills of Mt. Hood. The second site will be in our Tomahawk block. We will apply MBI015 at 3 rates. The first rate will be the proposed maximum label rate for MBI015 of 64 fluid oz per acre and the other 2 rates will be at the exaggerated rates of 2X and 4X this maximum rate of 64 fluid oz per acre. Applications will be under several timings including dormant and in-season applications. The protocol will be finalized in winter 2023. Evaluations for efficacy and potential phytotoxicity will be completed after MBI015 applications and yields will be calculated for each of the 6 varieties based on the herbicide regime of MBI015 each of these varieties has received.

3. Plot Design:

 Randomized complete block with a minimum of 3 replicates per treatment.

4. Methods:

Basal sprays of MBI015 will be applied at timing detailed by agreement among IR-4 and WSU staff and BASF technical development representatives at multiple timings per the dormant and growing seasons of 2023.

5. Means by which data will be analyzed or interpreted.

Visual inspection of the hop plants will be completed at specific timings post treatment with MBI015 and given a numerical score for each replicate of each treatment. These data will be analyzed by analysis of variance and if the ANOVA passes the *F*-test means separation tests will be completed. Yields from each of the plots will be taken by completing dry matter tests beginning in late August and as each variety matures and ripens they will be harvested with a minimum of 8 bines per treatment replicate per variety. Weights will be calculated and extrapolated to the potential yield per acre. These data will be analyzed by analysis of variance and if the ANOVA passes the F-test means separation tests will be completed.

6. Potential pitfalls and limitations to proposed procedures, if applicable.

As with all herbicide efficacy and crop safety studies with candidate herbicides, the efficacy of MBI015 may not provide adequate weed or sucker control or MBI015 may prove to be too phytotoxic for hops.

**Time Frame for Objectives:**

When procedures and treatments are finalized a revised proposal with a timeline and Gantt style worksheet will be developed and provided to the WA Hop Commission and Hop Research Council.

**Project Budget: 60% HRC, 40% WA Hop Commission**

|  |  |  |  |
| --- | --- | --- | --- |
| Expenditure | Hop ResearchCouncil Request | Commission/Other Request (specify)  | Total Amount Requested |
| State:Washington | Other: |
| Amount (cash) | Amount (cash or in-kind) |
| Salaries1 | 5,027 | 3,351 |  | 8,378 |
| Employee Benefits | 2,168 | 1,445 |  | 3,613 |
| Temporary or hourly workers | 0 | 0 |  | 0 |
| Travel2 | 375 | 250 |  | 625 |
| USA Hop Convention Registration | 0 | 0 |  | 0 |
| Equipment |  |  |  |  |
| Maintenance chemicalsLand Charges3  | 1,070360 | 714240 |  | 1,784600 |
| Total | 9,000 | 6,000 |  | 15,000 |

1/ Research Assoc Dan Groenendale 0.05 FTE for 12 months plus benefits @ 36.1%

 Farmer 2 Antonio Moreno 0.10 FTE for 12 moths plus benefits @ 49.2%

2/ 1,000 project miles @ $0.625/ mile

3/ Land charges 1 acre @ $600 per acre

**Other Funding Sources and Support:**

This project is under consideration for funding by the IR-4 Integrated Solutions program. BASF has also agreed to partially fund this project up to 50%. More clarity on this situation should be available on budget requirement by the WA Hop Commission October preliminary funding meeting and by when Research proposals are due to the HRC on October 20, 2022.