

Medusahead Control Efficacy of Pre-emergence Herbicides Labeled in Kentucky Bluegrass

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Abstract

Reports indicate that Medusahead (*Taeniatherum caput-medusae*) is present in Kentucky bluegrass (KBG) seed production fields in central Oregon. Medusahead plants establish primarily during the fall, and the emergence pattern is affected by moisture distribution. The efficacy of pre-emergence herbicides applied in the fall for Medusahead control relies on rainfall for an appropriate incorporation, since irrigation water is no longer available. For this reason, a timely application of pre-emergence herbicide is important. A field study was conducted comparing Outlook[®] (21 fl oz/acre) and Prowl H20[®] (3.2 qt/acre) applied at three different timings during the fall for Medusahead control. Herbicide performance was affected by the amount of rainfall after the application, particularly of Prowl H20[®], a less soluble compound. Medusahead control with Prowl H20[®] was poor and the highest level of control was recorded when applied in October with 19 percent. In comparison, control with

Outlook[®] was significantly better, particularly with the November and December applications where control was above 80 percent. Results indicate that Outlook[®] can be an option for Medusahead control when irrigation water is no longer available. The performance of Prowl H20[®] requires further review in conditions that ensure the soil incorporation.

Introduction

Because of their morphological and physiological similarities, it is difficult to control annual grasses within a field of perennial grasses. The persistence of annual grass infestations results in a perpetual loss of yield. Medusahead is a ubiquitous invader of rangelands and pastures, and recent reports indicate that this annual grassy weedy species is present in Kentucky bluegrass (KBG) seed production fields in central Oregon. The presence of Medusahead raises concerns among producers because it has the potential to reduce yields, affect seed quality, and can produce large amounts of fine fuels creating hazardous fire conditions. Finding an effective control for Medusahead that is already labeled for KBG is a high priority because obtaining a label for a new product requires time. Medusahead infestations in pastures and rangelands are characterized by rapid and aggressive spread. To address infestations in KBG fields, a rapid and effective response is required. Medusahead plants establish primarily during the fall, but the emergence pattern is often not uniform because germination is strongly affected by moisture distribution. The control efficacy of pre-emergence herbicides in the fall can be compromised under these conditions, since herbicides can be broken-down before seed germination by light, soil microorganisms, etc., affecting the performance. For this reason, a timely application of pre-emergence herbicide is important.

Materials and Methods

A field study looking at fall applications of pre-emergence herbicides for Medusahead control was initiated in October of 2011 in Jefferson County, Oregon. The study was conducted on non-

agricultural land in order to ensure a high level of Medusahead infestation. Medusahead thatch was removed before spraying to improve soil contact by herbicides. The entire area was later sprayed with glyphosate, to ensure that the Medusahead plants inside the plots would only be those that germinated after the initiation of the study. The study design was a randomized complete block with four replications. Plot size was 10 ft wide by 30 ft long. The treatments consisted of applying pendimethalin (Prowl H2O[®]) and dimethenamid (Outlook[®]) at three different timings. To determine the time of the year when the majority of the Medusahead germinations occurred, three sets of untreated checks were included, one for each application timing. At each application, the corresponding untreated check was sprayed with glyphosate to eliminate the medusahead that had previously germinated. Herbicide efficacy was evaluated in the spring of 2012. Herbicides were applied with a backpack sprayer calibrated to deliver 20 gallons of spray solution per acre at 40 psi pressure using XR 8002 Teejet[®] nozzles. Application dates and environmental conditions are detailed in Table 1. Herbicides were evaluated 120 days after the last treatment (DAT).

Results and Discussion

The number of Medusahead seed heads in the untreated checks average 46 head/ft², and no significant differences were observed among the untreated checks, suggesting that most Medusahead plants germinated during spring. Weed control with Prowl H2O[®] was not satisfactory regardless of the application timing, with control levels ranging from 8 to 19 percent (Table 2). Control with Outlook[®] was significantly higher, particularly when applied in November or December with 83 to 84 percent control. These can be considered good levels of control for four months after the applications, when taking into consideration that the herbicides tested require moisture after application to ensure soil incorporation. The amount of rainfall for proper herbicide incorporation was a critical factor as indicated by the precipitation recorded after the applications (Table 3). Outlook[®] is a more soluble herbicide and the amount of precipitation after the November and December applications was probably enough to incorporate the herbicide in the soil. In contrast, Prowl is a less soluble compound that is deactivated by sunlight if not incorporated after the application. These preliminary results suggest that Outlook[®] can be an option for Medusahead control for fall applications when irrigation water is no longer available. The performance of Prowl H2O[®] in controlling Medusahead will need further review in conditions that ensure soil incorporation of the herbicide.

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Table 1. Application dates, environmental conditions, for all application timings.

	A	B	C
Application Date	10/15	11/20	12/14
Time of Day	1 PM	11 AM	1 PM
Air temperature (F)	51	42	38
Relative Humidity (%)	59	72	54
Wind Speed (MPH)	6	3	5
Wind Direction	N	W	ENE

Table 2. Medusahead percent control compared to the untreated checks, 120 days after the last application.

	Treatment ¹	Product/Acre	Code ²	% Control ³
1	Prowl H2O [®]	3.2 qt/acre	A	19 c
2	Prowl H2O [®]	3.2 qt/acre	B	9 c
3	Prowl H2O [®]	3.2 qt/acre	C	8 c
4	Outlook [®]	21 fl oz/acre	A	46 b
5	Outlook [®]	21 fl oz/acre	B	83 a
6	Outlook [®]	21 fl oz/acre	C	84 a
7	Untreated Check			0 c
LSD (P=.05)				16

¹Some treatments included in the study were used for experimental purposes and are NOT currently labeled for public use. Before using an herbicide, make sure it is properly labeled for the intended use.

²Application codes: A= 10/15/2011; B=11/20/2011; C=12/14/2012

³Means among columns followed by the same letter are not different at P=0.05.

Table 3. Amount of rainfall in inches recorded during the period of study.

Period 2011-2012	Inches
10/15 – 11/15	0.08
11/15 – 12/15	0.14
12/15 – 1/15	0.77
1/15 – 5/1	4.41