

## **All Things Clearfield Wheat**

**By Andy Hulting, Carol Mallory-Smith, Alejandro Perez Jones, and Sandy Macnab**

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At several wheat grower and Extension meetings this fall the interrelated themes of Clearfield wheat variety selection, imazamox (Beyond or Clearmax) herbicide performance, jointed goatgrass (JGG) and Clearfield wheat hybridization, herbicide resistance management and imazamox carryover have all been popular discussion topics. It is unclear as to exactly why these issues have come to the forefront during this growing season because the Clearfield wheat system has been in use for several years now. However, reports of inconsistent control of grass weeds with imazamox coupled with reports of increased presence of JGG *X* wheat hybrids and various imazamox carryover scenarios across the state this year are likely leading to the increased discussion. Below I revisit and give updates on some of these topics.

### ***Environmental conditions can affect imazamox performance***

There were several reports of inconsistent JGG, feral rye and downy brome control with imazamox in Clearfield wheat this season. The poor control is likely due to timing of application or environmental conditions at the time of or soon after application rather than resistance to imazamox. However, if true resistance is suspected growers or fieldmen can contact our group concerning testing of specific weed populations. We know that control of several grass weeds decreases with temperature after application and under dry or extremely wet conditions. In fact, language on the Beyond and Clearmax product labels spells out the environmental conditions that may lead to inconsistent weed control and/or wheat injury. It is important not to apply imazamox when cold, wet weather is expected within one week following application. Reduced weed control efficacy and crop injury may occur when maximum daytime temperatures are less than 40° F after application. If possible, growers need to time fall and spring applications of imazamox to avoid these types of conditions and maximize weed control efficacy with imazamox.

### ***Latest findings on the JGG and wheat hybridization issue***

The OSU Weed Science Group continues to monitor the JGG and Clearfield wheat hybridization scenarios. JGG *X* wheat hybrids tend to be very robust plants that may be better competitors than either wheat or JGG for water, light and nutrients and could be a serious weed management issue when found at high densities. This year tissue and seed samples were collected from JGG and JGG *X* wheat hybrids in a field located in Sherman County prior to harvest this fall. Based on the tissue test, 100% of the hybrids tested from this population carried the gene from Clearfield wheat conferring resistance to imazamox. Seed from the plants was planted in the greenhouse in Corvallis and seedlings were sprayed with labeled use rates of imazamox. None of the JGG seedlings tested were resistant to the imazamox treatments in the greenhouse, but all of the seedlings resulting from the hybrid plants were resistant. We know that hybridization continues to occur in the field and that a percentage of these hybrids are resistant to imazamox, as was the case

in this particular field. These hybrids are male sterile plants and require pollen from either wheat or JGG to reproduce but can backcross to both species. The potential exists for the gene conferring resistance to imazamox to eventually be expressed in JGG populations resulting in the loss of the Clearfield technology if these new resistant JGG populations became wide spread. Those growers electing to plant the Clearfield wheat varieties based solely on yield potential and electing not to treat with imazamox will increase chances of hybridization between wheat and JGG if JGG populations exist in or near the field. This may result in the buildup of a resistant population over time that is not only resistant to imazamox, but also has the potential to be a very competitive weed. Doing a good job controlling JGG and hybrids in fallow in wheat-fallow systems will slow the development of the hybrid populations.

***Crop rotation restriction label changes anticipated?***

There has been recent speculation regarding changes to the crop rotation intervals on the Beyond and Clearmax labels based on some recent imazamox carryover cases. Herbicide label changes are common and plant back restrictions are continuously adjusted to reflect cropping system management effects, such as tillage and irrigation practices, on herbicide carryover potential for specific production regions. I urge growers to always be on the lookout for updated labels for these two specific products and many others. For some oilseed crops newer to the region, such as safflower or camelina, not currently listed on the labels and for which the plant back intervals have yet to be determined the plant back interval is likely greater than 18 months and may be as long as 26 months. The table below is a current, partial listing of rotational crop plant back intervals following Beyond and Clearmax applications.

Plant Back Interval (Months)	Crop(s)
0	CLEARFIELD* Wheat, CLEARFIELD* Sunflower, CLEARFIELD* Canola, Dry Beans, Dry Peas, Soybeans
3	Alfalfa, Wheat (non- CLEARFIELD*)
4	Cereal Rye
8.5	Corn (CLEARFIELD* and non- CLEARFIELD* pop, sweet, field, and seed)
9	Barley <sup>1</sup> , Oat, Onion, Sunflowers, Peanut, Watermelon, Pumpkin
18	Barley <sup>1</sup> , Carrot, Potato, Broccoli, Turnip, Cabbage
26	Canola, Condiment Mustards, Sugar Beet, Table Beet

<sup>1</sup> See Beyond or Clearmax labels for soil pH, tillage system and cumulative rainfall and/or irrigation requirements that most closely approximate your production system to determine the appropriate barley plant back interval.

***Extension publications available...***

Hard copies or online versions of publications related to Clearfield wheat and weed management with imazamox are available (or soon will be in the case of the ORCF 101

and 102 Clearfield Wheat Variety Guides) from OSU Extension and Experiment Station Communications or from WSU Publications:

<http://extension.oregonstate.edu/eesc/>

<http://cru84.cahe.wsu.edu/cgi-bin/pubs/index.html?id=Bu5AtacD>

ORCF 101 CLEARFIELD\* Soft White Winter Wheat

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Weed Management in Clearfield Wheat with Imazamox. EM 8833

Management Strategies for Preventing Herbicide-Resistant Grass Weeds in Clearfield Wheat Systems. PNW 572.

Herbicide-Resistant Weeds and Their Management. PNW 437.