Can Postemergence Callisto activity on grass weeds be improved with atrazine
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Callisto (mesotrione) is a relatively new herbicide with activity on a number of both grass and broadleaf species. Callisto is labeled to be preemergence (PRE) or postemergence (POST) applied in corn and inhibits HPPD, a blockage which leads to bleaching symptoms in susceptible plants. A number of researchers have observed that the efficacy of Callisto + atrazine is substantially more than Callisto alone, particularly on grass weed species and certain broadleaves such as giant ragweed. Greenhouse work has recently been completed at Utah State University to examine this potential interaction and was supported by observations in the field.

Photosynthesis and growth of four weed species (green foxtail, barnyardgrass, velvetleaf, and redroot pigweed) following foliar applications with either Callisto (3 oz/A), atrazine (1 pt/A), or a tank mix of Callisto (3 oz/A) + atrazine (1 pt/A) were compared in a greenhouse experiment (Figure). Photosynthesis and dry mass of barnyardgrass, redroot pigweed, and velvetleaf were significantly reduced by Callisto and atrazine alone and in combination. Long-term photosynthesis and dry mass of green foxtail plants were not suppressed by either herbicide applied alone, but plants treated with the Callisto/atrazine tank mix did not regain photosynthetic capacity and had significantly lower dry mass. Shoot dry mass of broadleaf weeds was reduced by all three herbicide treatments, except large redroot pigweed plants treated with mesotrione alone.

Figure. Barnyardgrass plants 14 days after herbicide treatment in the greenhouse.

a) Nontreated
b) Atrazine (1 pt/A)
c) Callisto (3 oz/A)
d) Callisto (3 oz/A) + atrazine (1 pt/A)*

* Plants grown in a greenhouse are only exposed to favorable growing conditions are generally more sensitive to herbicides than plants grown outdoors. This level of barnyardgrass activity with Callisto + atrazine was not observed in the field.

In the field, POST Callisto controlled redroot pigweed and velvetleaf but failed to adequately control green foxtail. Tank mixed applications of Callisto and atrazine resulted in a 3-fold increase in green foxtail control (64%) and more consistent control of redroot pigweed over Callisto alone.
In conclusion, tank mixing Callisto and atrazine POST:

- Increased herbicidal activity on barnyardgrass, and green foxtail.
- Resulted in more consistent control of redroot pigweed.
- We recommend tank mixing Callisto with atrazine if corn is less than 12” tall to maximize activity on weeds, particularly giant ragweed. If corn is greater than 12” tall, other tank mix partners should be considered. Some evidence exists that other photosynthesis inhibitors such as Buctril may also synergize with Callisto and have a wider application window than atrazine.

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