Final Report:
Evaluation of lactofen and acifluorfen herbicides for use in dry edible bean

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There are relatively few postemergence herbicides available for use in dry edible bean in Wyoming. Conversely, there are far more herbicides registered for use in soybean. The objective of this study is to evaluate weed control and crop safety of two commonly used soybean herbicides. Ultra Blazer (acifluorfen) and Cobra (lactofen) herbicides are widely available in soybean growing regions, and provide effective control of many pigweed species. The Cobra herbicide label lists effective control of black nightshade, redroot pigweed, Palmer amaranth, kochia, sunflower, and Venice mallow (among many other weeds) at a use rate of 12.5 fl oz/A. Research conducted in North Dakota in 1999 suggested this herbicide could be used safely in dry bean at 6 fl oz. per acre. It is unclear whether there is sufficient efficacy to control weeds with acceptable levels of crop injury in Wyoming.

If either of these herbicides are shown to be effective on important weeds and safe for the crop, they may provide important new tools for weed control in dry beans. Both herbicides have substantially shorter crop rotation restrictions than currently available herbicides (Cobra has no rotation restrictions, and any crop may be planted 100 days after Ultra Blazer application).

METHODS:
A field dose-response study was conducted at the Sustainable Agriculture Research and Extension Center near Lingle, WY in 2022 to evaluate crop safety in pinto bean and weed control efficacy for these 2 herbicides. Dry bean ('Poncho') was planted in 30-inch rows, and herbicides were applied when the beans reached the 2 trifoliolate stage. Weeds were 1 to 3 inches in height at the time of herbicide application. Ultra Blazer was applied at rates of 6, 12, 16, 24, and 32 fluid ounces per acre; Cobra was applied at rates of 4, 8, 10, 12.5, and 25 fluid ounces per acre. Varisto (a pre-mix of imazamox and bentazon) was applied as a comparison treatment at the recommended rate of 21 fluid ounces per acre. A non-treated check was also included to aid in evaluation of weed control and crop injury. No herbicide provided residual weed control, so the study was terminated 28 days after the herbicide applications were applied.

RESULTS:
At the typical soybean application rates of 16 and 12.5 fl oz/A, Ultra Blazer and Cobra caused 42% and 60% dry bean injury, respectively. For comparison, the Varisto treatment (21 fl oz/A) caused just 5% crop injury 8 days after treatment (Figure 1).

Neither Cobra nor Ultra Blazer provided better weed control than Varisto herbicide, regardless of application rate (Figures 2 & 3). Even at the highest rates evaluated, Ultra Blazer did not provide sufficient control of redroot pigweed or hairy nightshade. At application rates greater than those typically used in soybean, Cobra herbicide provided pigweed and nightshade control similar to Varisto applied at 21 fl oz/A. However, at rates required to obtain weed control similar to Varisto, crop injury would likely be unacceptable to most dry bean growers.

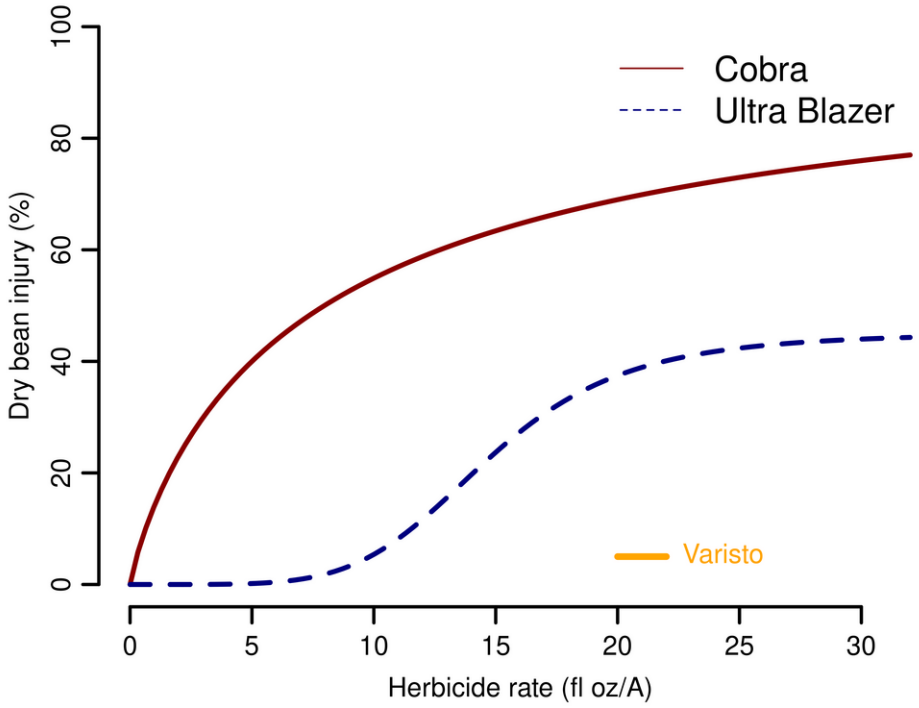

Figure 1. Crop injury caused by Cobra, Ultra Blazer, and Varisto herbicides near Lingle, Wyoming, 2022.

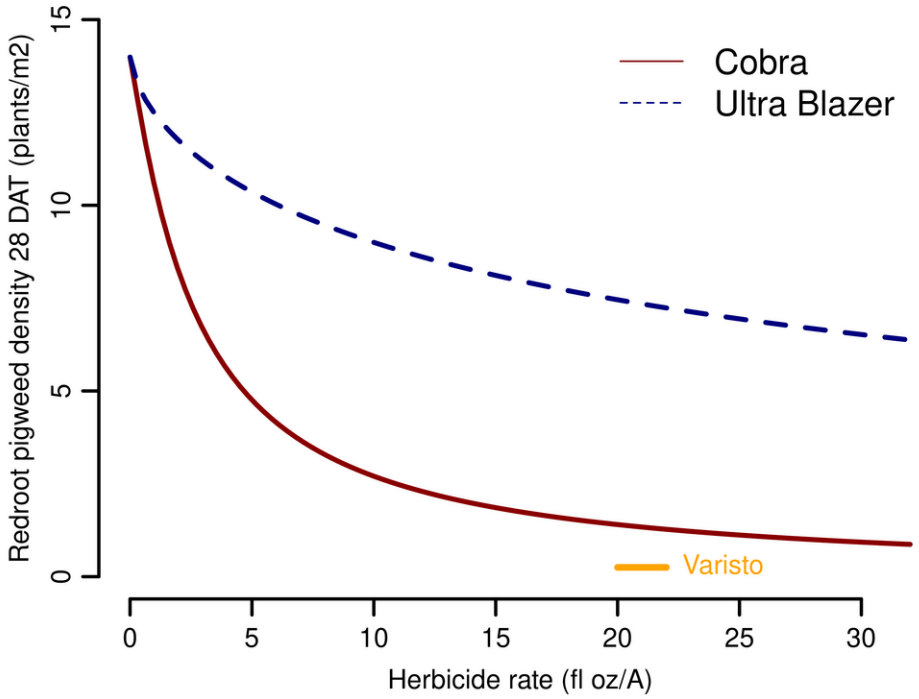

Figure 2. Redroot pigweed density 28 days after treatment with Cobra, Ultra Blazer, and Varisto herbicides near Lingle, Wyoming, 2022.

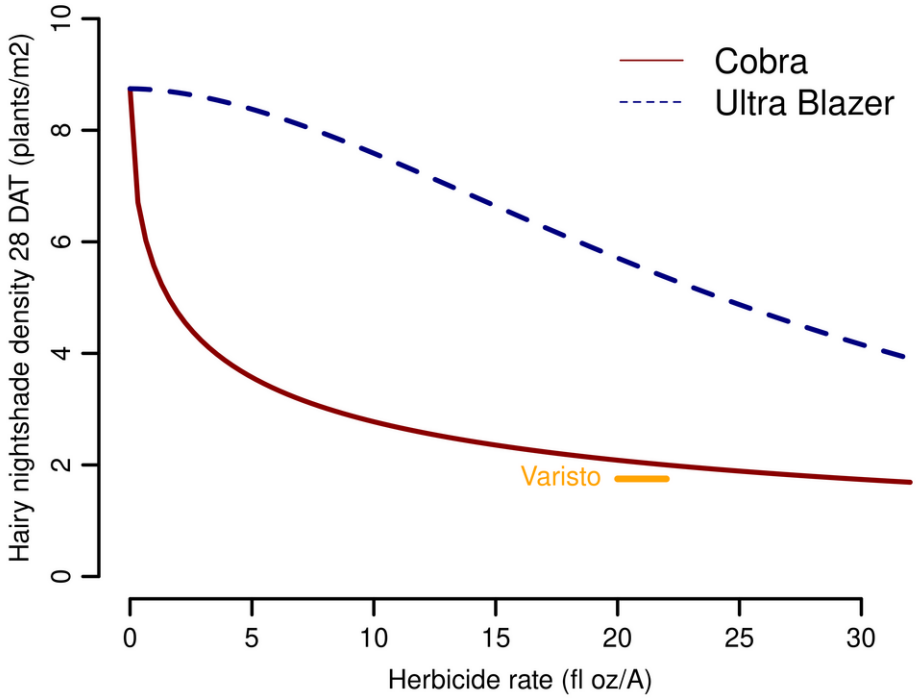

Figure 3. Hairy nightshade density 28 days after treatment with Cobra, Ultra Blazer, and Varisto herbicides near Lingle, Wyoming, 2022.