

Tribenuron formulations and weed control. Zollinger, Richard K. and Jerry L. Ries. An experiment was conducted near Casselton, ND, to evaluate weed efficacy from two tribenuron formulations with adjuvants. Tribenuron-resistant sunflower, Pioneer 'XF3312', was planted on June 11, 2004. POST treatments were applied on July 1 at 8:40 am with 70 F air, 78 F soil surface, 50% relative humidity, 5% clouds, 4 to 6 mph NE wind, dry soil surface, moist subsoil, poor to fair crop vigor, and no dew present to cotyledon to V4 sunflower. Weed species present: 2 to 7 inch (5 to 25/yd²) common cocklebur. Treatments were applied to the center 6.7 feet of the 10 by 40 foot plots with a backpack-type plot sprayer delivering 8.5 gpa at 40 psi through 8001 TeeJet flat fan nozzles. The experiment had a randomized complete block design with three replicates per treatment.

Tribenuron does not usually provide adequate common cocklebur control. Tribenuron (Express) resistant sunflower is in development by sunflower breeders across the U.S. and on release could provide economical and effective weed control. Common cocklebur is a common weed infesting sunflower and no herbicide is currently registered in sunflower for control. Selecting adjuvants that increase weed control from tribenuron may provide better control. Tribenuron solubility increases as spray solution pH increases. Increasing spray solution pH may increase the amount of tribenuron absorbed and eventual weed control. Basic pH blend (BB) adjuvants increase spray solution pH thus increasing the tribenuron solubility. Methylated seed oil (MSO) type adjuvants increase the amount of herbicide absorbed by dissolving cuticular waxes that act as a barrier to herbicide absorption. MSO & BB adjuvants appear to solubilize tribenuron and dissolve common cocklebur leaf cuticle for greater herbicide absorption and improved weed control. The Express SG formulation of tribenuron is a new formulation in development from DuPont and has properties which raise the pH of the spray solution. Express SG at 0.01 lb/A with adjuvants gave common cocklebur control similar to Express XP at 0.016 lb/A. Addition of BB adjuvant alone or with MSO to the SG formulation of tribenuron did not increase common cocklebur control suggesting that the SG formulation performed the same function as the BB adjuvant in increased spray solution pH and solubilizing tribenuron. (Dept. of Plant Sciences, North Dakota State University, Fargo).

Table. Tribenuron formulations and weed control (Zollinger and Ries).

| Treatment ¹ | Adjuvant rate (product/A) | XANST (28 DAT) | |
|------------------------|------------------------------|---------------------------|---------------------------|
| | | 75 XP ² (%) | 50 SG ³ (%) |
| Tribenuron+ | | | |
| R-11 | 0.25% v/v | 33 | 37 |
| R-11+AMS | 0.25% v/v+1.0 lb | 42 | 33 |
| Herbimax | 1.0 qt | 40 | 42 |
| Herbimax+AMS | 1.0 qt+1.0 lb | 45 | 42 |
| Scoil | 1.5 pt | 67 | 63 |
| Scoil+AMS | 1.5 pt+1.0 lb | 57 | 62 |
| Quad 7 | 1% v/v | 62 | 62 |
| Renegade | 1.5 pt | 72 | 69 |
| Z-64 | 1.5 pt | 69 | 68 |
| Huntsman+TBP | 0.1% v/v+0.1% v/v | 58 | 43 |
| ClassAct NG | 2.5% v/v | 50 | 38 |
| LSD (0.05) | | 9 | 9 |

¹Tribenuron was included according to footnotes 2 and 3; R-11 = nonionic surfactant; AMS = ammonium sulfate; Herbimax = petroleum oil concentrate; Scoil = methylated seed oil; Quad 7 = basic pH blend; Renegade = methylated seed oil basic pH blend; Z-64 = methylated seed oil basic pH blend + 28% nitrogen + surfactant; Huntsman = Surfonic L68-28X; TBP = tribasic phosphate; ClassAct NG (Next Generation) = surfactants + fertilizer.

²75 XP = Express 75 XP, tribenuron at 0.016 lb/A.

³50 SG = Express 50 SG, tribenuron at 0.01 lb/A.