EFFECT OF ADJUVANT, SPRAY VOLUME, AND RATE ON DRY BEAN DESICCATION WITH SAFLUFENACIL. Jordan L. Hoefing*, Brian M. Jenks, Gary P. Willoughby, Richard K. Zollinger, Jerry L. Ries, and Robert G. Wilson, Research Specialist, Weed Scientist, and Research Specialist, North Dakota State University, Minot, ND 58701, Professor and Research Specialist, North Dakota State University, Fargo, ND 58108, Professor, University of Nebraska, Scottsbluff, NE 69361.

Saflufenacil is an experimental broadleaf herbicide that has potential for use as a dry bean desiccant. Two studies were conducted at Minot, ND, Fargo, ND, and Scottsbluff, NE in 2009 to evaluate 1) the effects of adjuvant and spray volume and 2) the effect of rate on dry bean desiccation with saflufenacil. The target application timing for all treatments was when 80% of the pods had started to turn from green to yellow.

Study 1: Treatments at all three locations included saflufenacil at 25 g/ha plus non-ionic surfactant (NIS) at 0.25% v/v, crop oil concentrate (COC) at 1% v/v, or methylated seed oil (MSO) at 1% v/v. These three treatments were applied with AMS (17 lb/100 gal) at 10 gal/A. To evaluate the effect of spray volume, saflufenacil (25 g/ha) plus MSO and AMS was applied at 47 L/ha.

Study 2: Treatments at all three locations included saflufenacil at 18, 25, and 50 g/ha plus MSO and AMS at 1.0% v/v and 17 lb/100 gal, respectively; glyphosate (840 g/ha) plus MSO and AMS; glyphosate tank mixed with saflufenacil (18 g/ha) plus MSO and AMS; flumioxazin (54 g/ha) plus MSO; and carfentrazone (44 g/ha) plus MSO and AMS. Scottsbluff also included carfentrazone plus MSO and AMS; carfentrazone tank mixed with glyphosate plus MSO and AMS; paraquat (560 g/ha) plus NIS; and glyphosate plus AMS. All treatments at Minot and Fargo were applied at 94 L/ha, while treatments at Scottsbluff were applied at 187 L/ha.

At Minot, treatments were evaluated visually for leaf, stem, and pod desiccation 4, 7, 10, and 14 DAT. At Fargo, visual desiccation was evaluated at 7, 10, and 14 DAT. At Scottsbluff, visual desiccation was evaluated at 5 and 10 DAT. In addition, actual plant moisture was determined at Minot and Scottsbluff by sampling three plants per plot before application and 7 and 14 DAT. Leaf/stems, pods, and seeds were evaluated separately.

Study 1: At Minot, visual leaf and pod desiccation were similar across adjuvants, which did provide faster desiccation compared to the untreated control. However, stem desiccation was faster with MSO compared to PO and NIS. In actual plant moisture sampling, MSO reduced stem/leaf moisture more than PO or NIS at 7 DAT. However, pod and seed moisture were similar across treatments, including the untreated control at 7 and 14 DAT.

At Scottsbluff, MSO and PO provided greater visual desiccation than NIS at 5 DAT; however, there were no differences between adjuvants or spray volume at 10 DAT. In actual plant moisture sampling, stem/leaf, pod, and seed moistures were similar across all treatments, including the untreated control.

At Fargo, dry bean desiccation generally was as follows: MSO $\geq$ PO $\geq$ NIS > untreated. The greatest separation was with stem desiccation at 14 DAT where MSO provided 93% desiccation compared to 83 and 65% for PO and NIS, respectively. Saflufenacil plus MSO applied at 47 L/ha generally provided 5-10% less desiccation than at 94 L/ha.

In summary, MSO tended to provide more visible desiccation than PO and NIS; however, actual plant moisture sampling indicated that the desiccant may have provided faster leaf/stem dry down, but did not reduce pod and seed moisture more than natural desiccation. Saflufenacil plus MSO at 94 L/ha generally provided equal or greater desiccation compared to 47 L/ha.

Study 2: At Minot, while results varied slightly among individual plant parts, overall visual desiccation tended to be as follows: saflufenacil $\geq$ flumioxazin $\geq$ carfentrazone $\geq$ glyphosate $\geq$ untreated at 4 and 7 DAT. By 10 DAT, desiccation was generally similar among treatments, with the exception of stem desiccation where carfentrazone and glyphosate were slower compared to other treatments. At Scottsbluff, visual desiccation results were generally similar to Minot. The addition of glyphosate to saflufenacil, flumioxazin, and carfentrazone increased visual desiccation 10-20%.

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At Minot, actual stem/leaf moisture results showed a similar trend to the visual evaluations: Stem/leaf desiccation tended to be as follows: saflufenacil ≥ flumioxazin ≥ carfentrazone ≥ glyphosate ≥ untreated. In contrast, pod and seed moistures were similar among treatments including the untreated control.

At Scottsbluff, visual desiccation results were generally similar to Minot. Paraquat provided faster visual desiccation (93%) than all other treatments (53-81%) at 5 DAT. However, by 10 DAT all treatments provided >92% overall desiccation. In the actual plant moisture sampling, there were no differences among treatments in stem/leaf, pod, or seed moistures.

At Fargo, visual desiccation results were generally similar to Minot and Scottsbluff with saflufenacil ≥ flumioxazin > carfentrazone > glyphosate ≥ untreated.

In summary, similar to the adjuvant study, the various desiccants appeared to dry down leaf material faster than natural desiccation, but did not reduce actual pod and seed moisture more than natural desiccation.