

NOVEL ADJUVANT SYSTEMS. Gregory K. Dahl, Joe V. Gednalske and Eric Spandl, Research Coordinator, Manager of Product Development and Agronomist, Agrilience LLC, St. Paul, MN 55164.

Oil based adjuvant systems have been developed that provide convenience, performance and desirable functions for herbicide applicators.

A recently recognized category of adjuvants is called high surfactant oil concentrates. High surfactant oil concentrates are emulsifiable oil based products that contain 25 to 50 percent surfactant by weight in a minimum of 50% oil by weight.

Separate field studies were conducted with nicosulfuron, nicosulfuron plus rimsulfuron, foramsulfuron, imazamox, clethodim, mesotrione, and other herbicides applied at reduced rates with oil type adjuvants. High surfactant oil concentrates were compared to crop oil concentrates, containing 17% emulsifier and 83% paraffinic oil, and methylated seed oils. Crop oil concentrates and methylated seed oils were applied at labeled rates. High surfactant oil concentrates were applied at one-half of the rate of the crop oil concentrates and methylated seed oils.

Weed control was evaluated visually. Weed control with herbicides applied with high surfactant oil concentrate adjuvants was similar to herbicides applied with crop oil concentrate. Herbicides applied with methylated seed oil provided weed control greater than or equal to that of herbicides applied with either high surfactant oil concentrates or crop oil concentrates.

Field studies were conducted to evaluate the influence of adjuvants on control of glyphosate tolerant volunteer corn with glyphosate plus reduced rates of clethodim. Treatments included the herbicides alone and the herbicides with ammonium sulfate, nonionic surfactant plus ammonium sulfate, crop oil concentrate plus ammonium sulfate, high surfactant oil concentrate plus ammonium sulfate and methylated seed oil with ammonium sulfate.

Treatments that contained an oil adjuvant system provided greater control of the glyphosate tolerant volunteer corn than treatments without oil adjuvants. Some treatments that contained oil adjuvants provided less broadleaf weed control than treatments that did not contain oils. The high surfactant oil concentrate plus ammonium sulfate adjuvant system provided the best balance of glyphosate tolerant volunteer corn and broadleaf weed control of the adjuvant systems tested.

A modified vegetable oil plus emulsifier system has been developed that has increased canopy penetration, retention and reduced spray drift. The product has been compatible with most nozzle types and has performed well in ground and aerial applications.

Field studies were conducted in windy conditions to determine the influence of the modified vegetable oil plus emulsifier on herbicide spray particle drift onto susceptible plants. Visual evaluations were made of the amount of herbicide injury and the distance herbicide injury symptoms were observed downwind from the treated area. Treatments of herbicide plus the modified vegetable oil plus emulsifier adjuvant had less herbicide injury downwind of the treated area than treatments with out the adjuvant. The modified vegetable oil plus emulsifier adjuvant reduced the distance downwind that herbicide injury symptoms were observed compared to where the herbicide was used without the modified oil adjuvant.

The modified vegetable oil adjuvant reduced the percentage of fine droplets with most nozzle types without significantly increasing the percentage of very coarse droplets. This adjuvant has been used satisfactorily with nozzles that are incompatible with polymer type drift control adjuvants.