Herbicides must be applied in a carrier, usually water, to ensure distribution onto plant surfaces. However, the water may contain bicarbonate ions, which can reduce the activity of clethodim (Select) and sethoxydim (Poast). Researchers conducted a study in 1995 to determine the rates of ammonium sulphate required and to determine the effectiveness of various fluid fertilizers as adjuvants to overcome this herbicide antagonism. Overall, the results showed that fluid fertilizer containing ammonium sources of fertilizer are a suitable and potentially cheaper substitute for ammonium sulphate and should minimize any antagonistic effect of sodium bicarbonate on either clethodim or sethoxydim efficacy.

Herbicides must be applied in a carrier, usually water, to ensure distribution onto plant surfaces. However, the water may contain bicarbonate ions, which can reduce the activity of clethodim (Select) and sethoxydim (Poast). Ammonium sulphate and ammonium nitrate have reduced the antagonistic effect of bicarbonate on the efficacy of these two herbicides.

Ammonium sulphate is used most frequently as a granular fertilizer, and dissolving the fertilizer in the spray solution can be time consuming. Determination of the amount of ammonium sulphate required will minimize the time required to dissolve the fertilizer. Fluid fertilizers are easier to handle than ammonium sulphate and may not be as corrosive. Identification of fluid fertilizers that overcome this antagonism would give producers a readily available source of fertilizer to overcome the herbicide antagonism.

The objective of this research was to determine the rates of ammonium sulphate required to overcome sodium bicarbonate antagonism of clethodim or sethoxydim and to determine the effectiveness of various fluid fertilizers as adjuvants to overcome this herbicide antagonism. Research was conducted at two sites in 1995 at the Brandon Research Station and at the Kernan Farm at the University of Saskatchewan. Barley was seeded for the weed species in the canola crop at both sites.

Four field experiments were conducted at each site to evaluate ammonium sulphate and fluid fertilizers as adjuvants. Ammonium sulphate was applied at 0, 1, 2 and 4 % (v/v). The fluid fertilizers were added at equivalent ammonium-nitrogen concentrations, specifically 1% v/v for 28-0-0, 0.64% v/v for 10-34-0 and 0.57% v/v for 12-0-026.
The research results indicated that only 1% (v/v) of a 490 g/L formulation of ammonium sulphate (equivalent to 0.49 kg/ha of granular ammonium sulphate at 100 L/ha spray volume) was required to overcome sodium bicarbonate antagonism of either clethodim or sethoxydim, regardless of the sodium bicarbonate concentration in the spray solution. Therefore, the addition of ammonium sulphate at 1% (v/v) is sufficient to minimize any negative effects of sodium bicarbonate in the spray solution. The fluid fertilizers 28-0-0, 10-34-0 and 12-0-0-26 were all effective in overcoming the same antagonism of either clethodim or sethoxydim.

Overall, the results showed that fluid fertilizer containing ammonium sources of fertilizer are a suitable and potentially cheaper substitute for ammonium sulphate and should minimize any antagonistic effect of sodium bicarbonate on either clethodim or sethoxydim efficacy.

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