

FLUMIOXAZIN FOR POSTEMERGENCE WEED CONTROL IN ONION. Bernard H. Zandstra and Michael G. Particka, Professor and Research Assistant, Michigan State University, East Lansing, MI 48824.

Onions are very sensitive to herbicide injury. Moderate stunting or foliar burn from herbicides may result in yield reduction. Onions also are very susceptible to weed competition. Herbicide-tolerant weed species tend to predominate where onions are grown continuously. New herbicide registrations are needed to broaden the weed control spectrum.

Flumioxazin was recently registered for onion. It gives good control of several broadleaves, including common lambsquarters, eastern black nightshade, ladythumb, redroot pigweed, and spotted spurge. In previous research, flumioxazin caused onion injury under some conditions. Experiments were conducted to determine rate, timing, and tank mix combinations for safe and effective use of flumioxazin on onion.

Flumioxazin was applied to onion pre- or postemergence alone or in tank mixes in 2005. Onions were evaluated for visual injury and yield. Experiments were conducted at three locations on muck soil in Michigan. Flumioxazin at 0.016 lb ai/a plus pendimethalin 3.8 ACS at 2 lb/a preemergence and again at the 2 leaf stage (LS) and 4-5 LS caused no crop injury and gave excellent yield. The same rate of flumioxazin plus pendimethalin 3.3 EC at 2 lb/a at the same growth stages resulted in significant crop injury and yield reduction. Flumioxazin at 0.032 lb/a applied in tank mixes with dimethenamid-P at 0.98 lb/a at the 2 or 4-5 LS caused yield reduction. Flumioxazin applied alone between applications of dimethenamid-P at 0.98 lb/a and pendimethalin 3.3 EC at 2 lb/a alone at the 2 and 4-5 LS, respectively, did not reduce yield.

Flumioxazin at 0.032 lb/a applied at the 2 and 4-5 LS in tank mixes with oxyfluorfen 2 EC or oxyfluorfen 4 SC at 0.031 or 0.063 lb/a did not reduce yield. The same combinations plus clethodim at 0.125 lb/a plus 0.5% nonionic surfactant (NIS) caused yield reduction. When flumioxazin at 0.032 lb/a was applied between the two applications of oxyfluorfen at 0.063 lb/a plus clethodim at 0.125 lb/a plus NIS, there was no yield reduction. The tank mix of pendimethalin 3.3 EC at 2 lb/a plus oxyfluorfen 2 EC at 0.063 lb/a plus clethodim at 0.125 lb/a plus NIS plus flumioxazin at 0.032 lb/a resulted in almost total yield reduction. A combination of pendimethalin 3.8 ACS at 2 lb/a plus oxyfluorfen 4 SC at 0.063 lb/a plus clethodim at 0.125 lb/a plus NIS plus flumioxazin at 0.032 lb/a resulted in only slight yield reduction.

Flumioxazin will be a valuable herbicide in onion production to control several tough broadleaf weeds. It should be applied alone or in combinations with water-based formulations of pendimethalin and oxyfluorfen to avoid crop injury.