

Uses

Bentazon provides postemergence yellow nutsedge (with repeat applications) and selective broadleaf control. Other sedges, such as annual, globe sedge, and kyllinga, also have varying degrees of susceptibility. Purple nutsedge is not satisfactorily controlled. All warm-season turfgrasses are tolerant to **bentazon**.

Glyphosate is a non-selective herbicide that provides excellent control of most annual and perennial plants. It also is used at reduced rates to control seedheads of low maintenance turfgrasses.

Ethofumesate is a selective preemergence herbicide for annual broadleaf and grass weeds in sugarbeets and overseeded dormant bermudagrass turf. Its primary use in turf is for preemergence and early postemergence control of annual bluegrass. If applied to non-dormant bermudagrass, injury and delayed "green-up" can occur.

Oxadiazon is a preemergence herbicide used for annual grass and selective broadleaf weed control in turf, ornamentals and rice. Irrigation is needed to incorporate this herbicide into the soil.

Quinclorac provides early postemergence crabgrass, torpedograss, and selective broadleaf weed control in bermudagrass, zoysiagrass, bluegrass, ryegrass, and tall fescue.

Behavior in Plants

Absorption

Bentazon is a contact herbicide injuring only those parts of the plant it comes in contact with. Very little acropetal or basipetal translocation occurs. Good coverage is essential for control. **Bentazon** is absorbed by plant foliage and initial symptoms in weeds are a bronze cast to the leaves, followed by necrosis. Upward movement does occur in the xylem following root absorption, but **bentazon** has little effect on germinating seeds.

Glyphosate is rapidly absorbed by foliage and stems. Woody species may uptake glyphosate through bark in some cases. It is absorbed rapidly due to high water solubility, anionic nature, lack of metabolism and slow mechanism of action. Environmental factors that favor actively growing plants will similarly favor glyphosate absorption and translocation. Tank

mixtures with triazines, MSMA, phenoxy or paraquat may reduce activity or increase the time required for **glyphosate** to work. Rainfall within six hours of treatment may reduce effectiveness. Increased translocation to the underground storage organs of perennial plants is achieved when treated at the later stages of vegetative growth, near flowering.

Ethofumesate is absorbed through emerging shoots of seedlings with relatively low root uptake. Not readily absorbed by leaves after the plant has generated a mature cuticle. Exposure of plants to preemergence treatments decreases epicuticular wax deposition on leaf surfaces, which enhances foliar absorption of subsequently applied postemergence herbicides.

Oxadiazon is applied preemergence and absorbed by germinating weeds. It usually is not absorbed by foliage. However, contact type of injury can be observed in some plants, especially when the wettable powder formulation is used on young seedlings.

Quinclorac is absorbed by the coleoptile and leaves as well as by roots.

Translocation

Bentazon, due to its contact mode of action, has little acropetal or basipetal translocation.

Glyphosate moves symplastically in plants and accumulates in metabolically active regions. **Glyphosate** follows the photosynthetic pathway from the source to the sink and can be exuded from roots of foliar-treated plants. Cool or cloudy weather following treatment may delay visual symptoms.

Ethofumesate is apoplastically translocated to the foliage following uptake by roots and emerging shoots, but is not translocated out of treated leaves.

Oxadiazon, due to its contact type of injury, does not appear to have significant translocation in plants.

Quinclorac. Translocation studies are in progress.

Selectivity

Bentazon provides annual broadleaf control including cocklebur, ragweed, prickly sida, wild mustard, plus others. Yellow nutsedge also is susceptible. Annual grasses are not affected. **Bentazon** is rapidly metabolized in tolerant species,