

BroadStar Herbicide

BroadStar Herbicide is the 0.25% granular formulation of flumioxazin. It is labeled for preemergence weed control in container and field-grown shrubs, trees, and ground covers. The use rate for BroadStar is 150 Lb product (0.375 Lb ai)/acre, with a maximum of two applications/year. This granular formulation of BroadStar has a high quality carrier, with no dust.

BroadStar controls a wide spectrum of annual broadleaf weeds and grasses; including hairy bittercress (*Cardamine hirsute*), spotted spurge (*Euphorbia maculata*), liverwort (*Marchantia polymorpha*), common chickweed (*Stellaria media*), yellow woodsorrel (*Oxalis stricta*), common groundsel (*Senecio vulgaris*), eclipta (*Eclipta prostrata*), crabgrass (*Digitaria* spp.), and annual bluegrass (*Poa annua*). BroadStar will provide at least 8-12 weeks of residual activity following the 0.75" of initial irrigation necessary to activate the herbicide.

The primary granular herbicides on the market include OHII (2% oxyfluorfen + 1% pendimethalin), Rout (2% oxyfluorfen + 1% oryzalin), Snapshot (0.5% isoxaben + 2% trifluralin), and Regal O-O (2% oxyfluorfen + 1% oxidiazon). These four herbicides also provide broad-spectrum weed control, but require two active ingredients. The use rates for these premixes also require a much higher amount of active ingredient (2.5-5.0 Lb ai/acre) compared to only 0.375 Lb ai/acre for BroadStar.

Field research conducted by Dr. Jeff Derr (Virginia Tech) resulted in BroadStar 0.34 Lb ai/A providing the best control of spotted spurge, common groundsel, long-stalk phyllanthus (*Phyllanthus tenellus*), and large crabgrass (*Digitaria sanguinalis*) compared to OHII (3.0 Lb ai/acre), Snapshot (3.75 Lb ai/acre), Regal O-O (3.0 Lb ai/acre), and Rout (3.0 Lb ai/acre) twelve weeks after application. Other trials by Dr. Derr showed that BroadStar was the most effective of the same five treatments in controlling long-stalk phyllanthus, eclipta, doveweed (*Murdannia nudiflora*), and mulberry weed (*Fatoua villosa*).

Early research conducted by Dr. Joe Neal (North Carolina State University) with a .17% granular formulation of BroadStar (0.25 Lb ai/acre) resulted in more effective control of spurge, bittercress, phyllanthus, doveweed, and eclipta than OHII (3.0 Lb ai/acre) ten weeks after application. However, this reduced rate of BroadStar was not as effective as OHII against crabgrass.

In 2002, Buzz Uber (Crop Inspection Services, Valley Center, CA) and Dr. Cheryl Wilen (UCCE, San Diego, CA) established trials comparing BroadStar (0.34 Lb ai/acre), OHII (3.0 Lb ai/acre), Rout (3.0 Lb ai/acre), Snapshot (5.0 Lb ai/acre), and Regal O-O (3.0 Lb ai/acre). Eight weeks after application, BroadStar was providing significantly better control of groundsel, mustard (*Brassica* spp.), and pigweed (*Amaranthus* spp.) compared to the other 4 treatments.

There is considerable crop safety with BroadStar, as long as the applicator follows the list of tolerant ornamental species found on the label. BroadStar does not inhibit root growth, which is a possibility when using herbicides containing dinitroanilines (OHII, Rout, Snapshot). However, BroadStar has considerable contact activity, similar to herbicides containing oxyfluorfen (OHII, Rout, Regal O-O), so care must be taken not to apply these granular

herbicides to wet foliage. Although BroadStar will not translocate within the crop, necrotic leaf spotting can occur if the foliage is wet at application. Even if there is some leaf spotting, subsequent growth is unaffected.

SureGuard Herbicide

SureGuard is the 51% water dispersible granule (WDG) formulation of flumioxazin. It is applied as a spray, and labeled for use in container and field-grown ornamentals, conifers, deciduous trees, and bare-ground non-crop areas. The use rates are 8-12 oz product (0.25-0.375 Lb ai)/acre, with a maximum of 24 oz (0.75 Lb ai)/acre/year. Only 0.5" of initial irrigation/rainfall is required to activate SureGuard, which will result in at least 3-6 months residual weed control. Similar to the preemergence activity of BroadStar, SureGuard controls a broad spectrum of broadleaf weeds and grasses with 92 species on the label.

SureGuard also has excellent postemergence activity on weeds up to 2" in height. For optimum activity, a non-ionic surfactant (0.25% v/v) or crop oil concentrate (1qt/acre) should be added to SureGuard.

Field studies have shown excellent residual weed control activity with SureGuard. In one trial, SureGuard (12 oz product/acre) provided 100% weed control 3½ months after application, compared to Pennant (metolachlor) at 2 pt/acre + Princep (simazine) at 1.5 Lb product/acre which was completely overrun with hoary alyssum (*Berteroa incana*), common ragweed (*Ambrosia artemisiifolia*), marestail (*Conyza canadensis*), and common lambsquarters (*Chenopodium album*). In another study, SureGuard at 12 oz product (0.375 Lb ai)/acre was providing 100% control of mustard and 95% control of marestail 9 months after application.

Research conducted by Dr. John Ahrens (University of Connecticut) showed that SureGuard (0.25 Lb ai/acre) was 93% effective against common ragweed after 3 months and still 84% effective 9 months after application. This compares to a tank mix of Princep at 2.0 Lb ai/acre + Surflan (oryzalin) at 3 Lb ai/acre which was only 79% active against ragweed after 3 months and providing only 28% control after 9 months.

Some nursery growers still utilize contact weed control programs, and must make many applications throughout the year to maintain "weed-free" areas. This compares to a residual program with a preemergence herbicide that should result in effective weed control for several months. In one trial, SureGuard (0.375 Lb ai/acre) was applied in willows. Less than 2 months after application, the grower had to apply Roundup (glyphosate) in the untreated trees, due to a high population of large crabgrass that had taken over the pots. Within 1-2 weeks following the Roundup application, spotted spurge began germinating, which in time would have completely covered the large pots if the grower did not make another application with a contact herbicide. During that same period of time, SureGuard was providing 96% crabgrass control and 99% control of spotted spurge.

SureGuard is safe to the crop, assuming the label instructions are followed. Due to the contact properties of SureGuard, caution must be taken when making applications. SureGuard should never be applied to actively growing foliage. Applications should be made only to woody

perennials (at least 1 year old) prior to bud swell in the spring or after dormancy has initiated in the fall (or after foliage has hardened off in conifers). SureGuard can be safely applied directly over conifers, provided bud break has not occurred.

SureGuard can also be applied to maintain bare ground in non-crop areas. These areas include bare ground around buildings, along fence rows, road surfaces, and gravel shoulders. SureGuard can be used at 8-12 oz (0.25-0.375 Lb ai)/acre. The length of residual activity would be based on rate, as well as sufficient irrigation/rainfall soon after application. Obviously the 12 oz/acre rate followed by at least ½" of initial irrigation/rainfall will optimize the residual activity of SureGuard.

Conclusion

BroadStar and SureGuard offer the nursery growers new choices for their weed control programs. Both herbicides provide excellent broad-spectrum control of annual broadleaf weeds and grasses. They are safe on the crop, with no root pruning (such as can occur with the dinitroanilines) and there is no volatility, which can be a potential injury problem as with herbicides containing oxyfluorfen. This new active ingredient (flumioxazin) and chemical class (N-phenylphthalimide) decreases the potential for development of resistant weeds, which makes BroadStar and SureGuard good rotation partners with existing herbicides.