

# Evaluation of Bentazon for Yellow Nutsedge Control in Container-grown Nursery Stock<sup>1</sup>

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**Abstract.** Postemergent applications of bentazon (3-isopropyl-1H-2, 1,3-benzothiadiazon- (4) 3H-one 2, 2 dioxide) at 0.84, 1.68, 3.36 and 6.72 kg ai/ha effectively controlled yellow nutsedge (*Cyperus esculentus* L.) in nursery containers but all rates severely injured container-grown woody ornamentals.

Herbicide research on container-grown ornamental crops has dealt primarily with the pre-emergent control of weeds (1, 2, 4, 5). At the present time, no satisfactory postemergent herbicides are available to control weed growth in container nursery stock without causing excessive phytotoxicity. Under commercial nursery conditions weeds may compete severely with container-grown nursery crops (3) and removal is accomplished only by costly manual labor.

Bentazon (Basagran) is available for postemergent control of broadleaved weeds in soybeans and turf and has been noted for its outstanding post-emergent control of yellow nutsedge. Since yellow nutsedge is occasionally a problem in container nurseries where field soils are used in the potting mix, this study was established to evaluate the use of bentazon for postemergent control.

Uniform cuttings of cotoneaster (*Cotoneaster dammeri* Schneid. cv. Royal Beauty), privet (*Ligustrum obtusifolium* Sieb. & Zucc. cv. Regelianum), spirea (*Caryopteris × clandonensis* A. Simmonds ex Rehd. cv. Blue Mist), and red osier dogwood (*Cornus sericea* L.) were planted in 3.8 liter plastic nursery containers on June 6, in a medium of equal parts of mosspeat and milled hardwood bark (by volume). At the same time, 1 year-old liners of Andorra Juniper (*Juniperus horizontalis* Moench. cv. Plumosa) were planted in 7.6 liter plastic nursery containers in the same medium. Following potting, 3 yellow nutsedge tubers were planted in each

nursery container at a depth of 9 cm. By July 5, the yellow nutsedge plants were about 12 cm in height and the postemergent applications of bentazon were made.

Bentazon was applied at 0.84, 1.68, 3.36 and 6.72 kg/ha (equivalent to ½, 1, 2, and 4× the normal rate) with a CO<sub>2</sub> constant rate sprayer, calibrated to deliver the equivalent of 55.2 liters of water per ha. At the time of the herbicide application wind speed was less than 8 km/hr (5 mph) and the air temperature was about 26°C. Within 3 hr of the herbicide application, all containers were irrigated with 2.5 cm of water from an overhead irrigation system. Plants received a standard fertilization and maintenance program throughout the experimental period.

Weed control and phytotoxicity evaluations were made periodically throughout the experimental period. Weed control and phytotoxicity was evaluated using a 0-10 visual rating scale with 0 representing no weed control or crop injury and 10 representing complete weed control or crop kill. A completely randomized design was used with 4 replications (3 plants/replicate) of each treatment.

At all rates of application, bentazon caused excessive phytotoxicity to the Andorra juniper, red osier dogwood and cotoneaster. The privet and spirea were injured at the 0.84 kg ai/ha rate, however, at 1.68 kg ai/ha phytotoxicity was excessive (Table 1). Bentazon

Table 2. Effect of bentazon on the control of *Cyperus esculentus* 17 and 35 days after treatment.

Treatment	Rate (kg ai/ha)	Weed control (%)	
		Days after application	
		17	35
Bentazon	0.84	94	85
	1.68	94	85
	3.36	99	98
	6.72	100	100
Weedy check	—	0	4
Hand weeded check	—	100	79

injury was characterized as a leaf burn, beginning at the apex, and proceeding toward the base. Within a 2-3 week period the leaf tissues were brown, giving a fired appearance and were completely necrotic.

Bentazon at all rates resulted in excellent postemergent yellow nutsedge control. Only at the 0.84 kg ai/ha rate was there any regrowth of the nutsedge following the single application of bentazon (Table 2).

While the use of bentazon shows great promise for the control of yellow nutsedge, and may be useful as a directed spray in field grown nursery stock, it has no place in container nursery crop production due to excessive phytotoxicity. In addition, landscape contractors and professional grounds maintenance personnel who use bentazon for nutsedge control in turf should exercise extreme caution when spraying near established ornamentals.

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Table 1. Effect of bentazon on phytotoxicity to container-grown nursery crops 35 days after application.

Treatment	Rate (kg a.i./ha)	Phytotoxicity score <sup>z</sup>				
		<i>Juniperus horizontalis</i>	<i>Cornus sericea</i>	<i>Cotoneaster dammeri</i> cv. Royal Beauty	<i>Ligustrum obtusifolium</i> cv. Regelianum	<i>Caryopteris × clandonensis</i> cv. Blue Mist
Bentazon	0.84	7.5	7.0	3.8	2.0	0.8
	1.68	9.4	10.0	6.5	3.8	1.8
	3.36	10.0	10.0	9.3	4.8	3.0
	6.72	10.0	10.0	10.0	7.5	3.3
Weedy check	—	0.0	0.0	0.0	0.0	0.0
Hand weeded check	—	0.0	0.0	0.0	0.0	0.0
LSD 5%		1.07	1.12	1.98	2.82	2.66

<sup>z</sup>0 (no crop injury) to 10 (crop kill).

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