

Control of Purple Loosestrife (*Lythrum salicaria* L.)

Introduction

Purple loosestrife is a federally listed invasive terrestrial plant that occurs in wetland areas. Although listed as an aquatic invasive plant, this species is terrestrial and can occur on ditch banks, creek and river sides, and other areas where water is near. Purple loosestrife is aggressive, reproducing by seed and the more problematic reproductive sprouts. This aggressiveness can displace native vegetation, degrade wildlife habitat, and reduce the efficiency of drainage areas. Purple loosestrife was first reported in Canada and the New England areas of the United States and now occurs in most of the continental United States with the most severe infestations still occurring in New England (USDA 2005). In Kentucky, infestations are more common and intense in the eastern regions of the state with occurrences beginning to appear in the central and western parts.

Purple loosestrife can easily be spread by mowing. Plant parts may remain on equipment and be transported away from the original site. Also, due to the close proximity to water, cuttings may be spread by the water flow or flooding disturbances. Species of *Lythrum*, including purple loosestrife, may be purchased in the landscaping and ornamental industry, further increasing its spread.

Current control options include biological and chemical control. Chemical control options usually include glyphosate, imazapyr, and triclopyr. Studies have shown imazapyr, at rates ranging from 20 to 96 fl oz per acre of 2 # product, can maintain 90 % control 1 YAT (Knezevic et al 2004). The same trial showed glyphosate at 2 and 3 qt / ac resulted in 70 to 75 % control 2 YAT while triclopyr tested at 1.5 to 2.5 qt / ac resulted in quick burndown initially but failed to provide greater than 50 % control over 2 years.

A trial was installed in 2006 to compare glyphosate and triclopyr, alone and tank mixed with imazapyr, for purple loosestrife control. The trial also examined other non-aquatic herbicides for their potential for control.

Methods and Materials

The study site was located in a soybean field near the banks of the Red River in Powell County, Kentucky. Fifteen treatments and one untreated check were evaluated in a randomized complete block design with 10' by 30' plots and four replications (Table 1). Treatments were applied on May 23, 2006 using a CO₂ powered sprayer mounted on an ATV. Visual percent control evaluations were taken 72 and 127 DAT. Data were analyzed using ARM® software and treatment mean separations were performed using Fisher's LSD at $p = 0.05$.

Results

Aquamaster at 1 qt / ac resulted in significantly lower control 72 DAT than any other Aquamaster treatment (Table 1). There appears to be an increase in efficacy when Habitat is added to the 1 qt of Aquamaster as that treatment provided 84 % control at the same evaluation period. Aquamaster at 2 qt alone or tank mixed with Habitat provided

greater than 70 % control 72 DAT. These differences in control are not seen 127 DAT. Aquamaster at 2 qt / ac plus Habitat at 0.5 pt / ac resulted in the highest control at this interval than any other Aquamaster treatments; however, there were no significant differences detected between these treatments. Control levels for the Aquamaster treatments ranged from 64 to 78 % 127 DAT.

There were no significant differences detected between any of the Garlon 3A treatments tested 72 DAT (Table 1). Control levels ranged from 61 % to 68 % at this evaluation. Control levels for the high rate of Garlon 3A tested (4 pt / ac) decreased from 72 DAT to 127 DAT indicating that this rate may be too high and burning down the plant too fast to allow proper translocation for control of sprouts. Garlon 3A at 2 pt / ac provided significantly higher control 127 DAT (78 %) and the two treatments using 4 pt / ac. There was no difference detected between the Garlon 3A at 2 pt / ac (78 %) and the tank mix of Garlon 3A at 2 pt / ac and Habitat at 0.5 pt / ac (70 %) 127 DAT.

Habitat alone treatments resulted in acceptable control levels 72 DAT. There were no differences detected among the high rate (1 pt / ac) and the two low rates (0.5 pt / ac with either MSO or NIS as the surfactant) at this interval. Control levels ranged from 85 to 93 %. Differences between the Habitat treatments were exhibited 127 DAT. Habitat at 1 pt / ac + NIS (75 %) provided significantly higher control than Habitat at 0.5 pt / ac + NIS (43 %) at 127 DAT. There was no difference detected between the Habitat at 1 pt / ac and the Habitat at 0.5 pt / ac + MSO. There were also no differences detected between the two 0.5 pt / ac treatments and the two surfactants. There does seem to be some operational benefit, although not statistically significant, to using MSO with Habitat at 0.5 pt / ac (60 % at 127 DAT) than using NIS (43 % at 127 DAT).

There were no differences between ForeFront R & P at 2 pt / ac and Milestone VM at 5 oz / ac at either evaluation. ForeFront R & P provided 83 % control 72 DAT and decreased to 70 % control 127 DAT. Milestone VM resulted in 89 % control 72 DAT and decreased to 75 % control 127 DAT.

Vanquish provided the highest control levels of any treatment tested at both evaluation intervals. At 72 DAT, Vanquish applied at 4 pt / ac resulted in 94 % control and 85 % control 127 DAT.

Journey at 32 oz / ac was significantly lower in percent control (28 %) than all other treatments tested other than Aquamaster at 1 qt / ac 72 DAT. Control did increase to 60 % at 127 DAT. It is likely that the low amount of glyphosate in this treatment did not prove to be high enough to cause burn down.

Results of this trial need to be examined while understanding that purple loosestrife is a terrestrial plant that thrives in wet areas. Vanquish does not have an aquatic label and should not be used in such areas. The treatments that provided the highest control levels and also include aquatic verbiage in their labels would be the Aquamaster and Habitat. The label for Garlon 3A does include aquatic language in its label; however, great care and complete understanding of the label is needed to prevent any off label applications of this or any of the above mentioned products.

Table 1: Summary Statistics for Purple Loosestrife Control

Trt No.	Type	Treatment Name	Rate	Rate Unit	Percent Control	
					72 DAT	127 DAT
1	HERB ADJ	Aquamaster NIS	2 0.25	QT/A % V/V	71a-d	64a-d
2	HERB HERB ADJ	Aquamaster Habitat NIS	2 0.5 0.25	QT/A PT/A % V/V	80a-d	78ab
3	HERB ADJ	Aquamaster NIS	1 0.25	QT/A % V/V	35e	66abc
4	HERB HERB ADJ	Aquamaster Habitat NIS	1 0.5 0.25	QT/A PT/A % V/V	84a-d	68abc
5	HERB ADJ	Garlon 3A NIS	4 0.25	PT/A % V/V	63d	56bcd
6	HERB HERB ADJ	Garlon 3A Habitat NIS	4 0.5 0.25	PT/A PT/A % V/V	65cd	48cd
7	HERB ADJ	Garlon 3A NIS	2 0.25	PT/A % V/V	61d	78ab
8	HERB HERB ADJ	Garlon 3A Habitat NIS	2 0.5 0.25	PT/A PT/A % V/V	68bcd	70abc
9	HERB ADJ	Habitat NIS	1 0.25	PT/A % V/V	90ab	75ab
10	HERB ADJ	Habitat MSO	0.5 1.25	PT/A % V/V	93a	60cd
11	HERB ADJ	Habitat NIS	0.5 0.25	PT/A % V/V	85a-d	43d
12	HERB ADJ	ForeFront NIS	2 0.25	PT/A % V/V	83a-d	70abc
13	HERB ADJ	Milestone VM NIS	5 0.25	FL OZ/A % V/V	89abc	75ab
14	HERB ADJ	Vanquish NIS	4 0.25	PT/A % V/V	94a	85a
15	HERB ADJ	Journey NIS	32 0.25	FL OZ/A % V/V	28e	60bcd
16	CHK	Untreated Check			0	0

Note: Treatment means followed by the same letter are not significantly different using Fishers LSD at $p = 0.05$.

Literature Cited

Knezevic, S.Z., Smith, D., Klum, R., Doty, D., Kinkaid, D., Goodrich, M., and Stolcpert, R., 2004. Purple loosestrife (*Lythrum salicaria*) control with herbicides: single year application. *Weed Tech.* 18: 1255 - 1260.

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