Identification and Control of Common Reed (Phragmites australis (CAV.) Trin. ex Steud.)

Introduction

Common reed, often referred to as phragmites, is a perennial invasive terrestrial grass that occurs across the United States. Although widely distributed across Europe, it is unclear as to the exact origin and method of introduction of this species. Categorized as a facultative wetland and obligate wetland species (USFWS 1996), phragmites can occur in a variety of moist to wet environments. The species can tolerate stagnant and flowing water, salt and alkaline conditions, and is commonly found in roadside ditches, marshes, and other wet area (Uva et al 1997). Individual stems can become very large (2 – 4 m in height) and form large monotypic stands. Stems are hollow, round, and become thicker towards the base of the plant. Leaves are fairly long (20 – 60 cm), flat, hairless, and have rough or sharp margins. Plants flower by mid summer in plume-like panicles with feathery spikelets that are purple at emergence and turn light brown with age. Plants rarely produce viable seed and reproduce mainly vegetatively through rhizomatous sprouting. This aids in its invasibility and spread as it is easily moved across sites through disturbances such as mowing, flooding, and road construction. Infestations of phragmites can be problematic in terms of degrading aquatic and terrestrial wildlife habitat and preventing roadside ditches and other waterway channels form operating efficiently.

Control options for phragmites are somewhat limited due to its usual proximity to aquatic environments. Miller (2004) recommended a 4 % glyphosate solution or a 1 % imazapyr solution applied as a foliar spray to control giant reed (*Arundo donax*), a species very similar to common reed. These herbicides are available for use for aquatic situations. These applications may cause unwanted damage to desirable grasses and forbs in the understory. This non target damage would be problematic since common reed can not readily establish itself in vegetated soil. Revegetation practices should be addressed when managing common reed infestations. Foliar applications of imazapyr and glyphosate have been shown to be influenced by mowing regimes as well. Hipkins and Witt (2007) showed that 2, 4, and 6 pt of Habitat resulted in 10, 0, and 15 % control respectively 1 YAT for unmowed phragmites. These same treatments resulted in 43, 67, and 57 % control, respectively, when the phragmites was mowed 5 weeks prior to treatment.

Applying glyphosate or imazapyr through unconventional methods, such as ‘wicking’ or ‘wiping’ herbicide applicators may allow for effective control of common reed while allowing desirable vegetation to survive and compete against common reed regrowth. Kay et al (1999) realized effective control 1 YAT (1.2 live shoots / m^2 versus 29.3 live shoots / m^2 in the untreated) with imazapyr at 6 pt / ac when applied through a Weed Sweep, a type of cut – wipe herbicide applicator. Glyphosate, applied at 6 pt / ac, was ineffective in reducing live shoot counts 1 YAT (33.9 live shoots / m^2).

A trial was installed in June of 2006 to examine the efficacy of glyphosate, formulated as Aquamaster®, and imazapyr, formulated as Habitat®, in combination with either a nonionic surfactant (NIS) or methylated seed oil (MSO)for their ability to control phragmites.

Methods and Materials

The trial was located in the cloverleaf of exit 53 on the Western Kentucky Parkway at County Road 181 just west of Central City, Kentucky. Phragmites stems were approximately 8 to 10 feet tall and was concentrated along the drainage areas through the cloverleaf area. Plots were linear and arranged in a randomized complete block to take advantage of the highest concentration of phragmites while minimizing desirable species damage. Plots measured 30 feet in length and averaged 10 feet in width. Treatments were applied on June 21, 2006 at 25 GPA using a CO_2 powered sprayer mounted on an ATV and a TeeJet® XP BoomJet® boomless nozzle (size 25) to broadcast over the top of the phragmites. Data were collected 72 and 352 DAT and included visual percent control of phragmites. Data were analyzed in ARM software and treatment means were separated using Fisher's LSD at p = 0.05.

Results

Aquamaster at 2 qt / ac resulted in significantly higher control of phragmites than Habitat at 2 pt / ac plus NIS and Habitat at 4 pt / ac + MSO 72 DAT (Table 1). There was also a high degree a variability noted at 72 DAT (CV = 110).
There were no differences in control of phragmites between any treatments 352 DAT (Table 1). Control ranged from 83 % with Habitat at 2 pt / ac plus MSO at 1 % v/v and 72 % worth Habitat at 4 pt / ac plus MSO at 1 % v/v. The high variability noted at 72 DAT was not present 352 DAT (CV = 17). There were a number of small green phragmites sprouts present across the entire treated area indicating the need for a follow-up treatment to completely control or suppress the phragmites.
Future research should include the effect of mowing prior to application, the use of sequential treatments for higher control, and the planting of desirable species to compete with phragmites.

Table 1: Treatments and results for Central City phragmites trial

Treatment	Rate per acre	Percent Control	
		72 DAT	352 DAT
Aquamaster + NIS	2 qt + 0.25 % v/v	50 a	77 a
Aquamaster + MSO	2 qt + 1 % v/v	15 ab	75 a
Aquamaster + MSO	4 qt + 1 % v/v	27 ab	78 a
Habitat + NIS	2 pt + 0.25 % v/v	7 b	78 a
Habitat + MSO	2 pt + 1 % v/v	23 ab	83 a
Habitat + MSO	4 pt + 1 % v/v	7 b	72 a
Habitat + MSO	6 pt + 1 % v/v	20 ab	80 a
CV		110	17

Note: Treatment means in the same column followed by the same letter are not statistically different using Fisher's LSD at p = 0.05. CV = coefficient of variation.

Literature Cited

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