HERBICIDE APPLICATION FOR WETLAND AND BUFFER MANAGEMENT

BWSR

TECHNICAL GUIDANCE DOCUMENT

Document No.: WRG 6A-1
Publication Date: 1/28/2012

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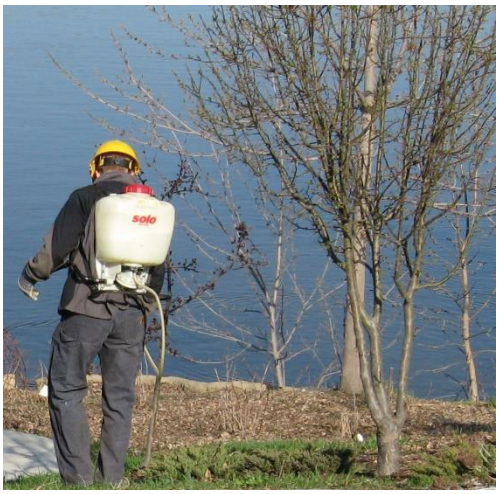
INTRODUCTION



Herbicide can be used to control invasive plants after native vegetation has established. Spot treatment of herbicide is a common practice to control perennial weeds and prevent them from spreading. It is important to understand the types of herbicides that can be used and how they work. Some herbicides target only specific species (non-selective) such as broad-leaf plants, legumes, or composites. Others are less selective and can kill any plant it comes into contact with. Non-selective herbicides will damage/kill a variety of plants regardless of metabolism or life-traits. For example, Glyphosate products will damage/kill a wide range of grasses and broadleaf plants. Selective herbicides will only damage/kill (when applied at recommended rates/doses) targeted groups of plants, i.e., products that specifically target broadleaf plants or grasses. For example, 2-4-D targets a variety of broadleaf weeds; whereas, Sethoxydim is selective only to grasses.

Selective and non-selective herbicides can be considered contact or systemic chemicals. Contact herbicides kill only the green tissues that come in contact with the chemical. Generally speaking, they kill small or seedling annual and biennial weeds and are injurious to larger annuals, biennials and perennials but not lethal. Systemic herbicides kill annual, biennial, and perennial weeds. They are called systemic (or translocated) herbicides because the product is intended to be moved with the plant's vascular system from the point of application to other parts of the plant. In perennial weeds, translocation of a systemic herbicide is more efficient at different times of the year, so herbicide application timing is important to provide the greatest control depending on the plant's life cycle.

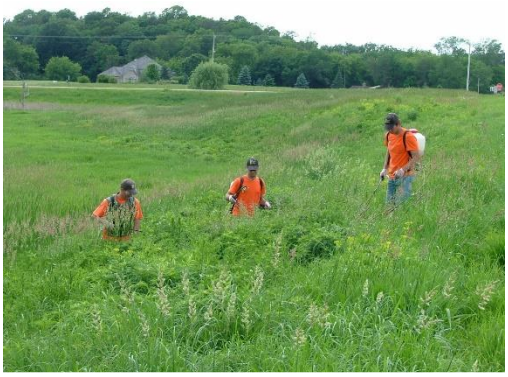
Many post-emergent herbicides need an adjuvant that allows the chemical to overcome natural barriers the plant has developed to impede movement of the chemical from its leaf surface into the cells. Some herbicide formulations (one example, Roundup Ultra) includes an adjuvant so that the applicator does not have to add them. Other herbicides may require the addition of a spray adjuvant to enhance the herbicide's performance. Common types of adjuvants: surfactants, crop oil concentrates, and ammonium fertilizers. In general, surfactants and crop oil concentrates reduce the surface tension of sprayer droplets, thus increasing the

amount of chemical that is retained on the leaf's surface and allowing the droplets to spread over a larger area. They also plan an active role in aiding herbicide movement through the cuticle and cell membranes. In the case of ammonium salts, uptake of ammonium by plants is thought to be a result of their need for nitrogen. Ammonium is thought to create a PH gradient across cell membranes that increases the uptake of the herbicide. Without going into the detailed chemistry of these three compounds, it is crucial to understand that products are designed and labeled to work with a particular adjuvant. Read and follow the product's label for recommended adjuvants.

It is critical to understand the herbicide that is being used, the recommended rates, the application process, whether a spray adjuvant is needed or not, mix ratios, sprayer calibrations and safety considerations. When spraying in natural areas it is recommended to avoid treatment when target species are in flower to minimize impact to pollinators and to avoid granular herbicides that may be eaten by birds. Always read herbicide product labels carefully, and follow the application directions as stated. For assistance contact your local extension agent or hire a licensed certified pesticide applicator. See Appendix 5-A for specific recommendations for invasive species control.

APPLICATION

Spot treatment of weeds with backpack sprayers is a common method of removing perennial weeds in restoration sites. If weeds such as Canada thistle can be found early in establishment they can often be treated with backpack sprayers before they spread and require application with boom sprayers. The entire leaf surfaces of target species should be covered to ensure removal. This often results in removal of non-target species but this may be unavoidable and it is more important to prevent the spread of invasive species. When large areas of native species are removed due to herbicide applications it may be necessary to re-seed to prevent re-establishment of problem species.



Spot Herbicide Treatment with Backpack Sprayers

An alternative to backpack herbicide application is the use of herbicide wands. Herbicide wands are used to wipe herbicide onto specific plants. Herbicide wands are typically hand held but tractor or ATV mounted wands can also be used. It can be difficult to avoid touching non-target plants, but seedlings and low growing plants can often be avoided.

Vegetation treatment adjacent to planted trees or shrubs needs careful application. Smaller individual trees can be shielded from the spray using a box, pail or other method. As trees increase in size, control of competition will be less of an issue. Typically, confers will require control of competition 5-7 years and other trees and shrubs 3-5 years. Vegetation can be prevented from growing around trees by using a pre-emergent herbicide or other methods.

When large areas require treatment, boom sprayers on ATVs or tractors are typically used. In some cases, grass specific or broad-leaf specific herbicides can applied to spare some native species. Early spring sprays with broad-spectrum herbicides can be used in prairies before warm-season species are active, but this technique should be used with caution as cool-season prairie species may be affected. It is important to use only aquatically-certified herbicides near open water. It is important that herbicide applicators have appropriate certification and equipment and that label recommendations are read and followed for all herbicide application. See Appendix 5-A for specific removal strategies. Links are provided below for techniques to remove specific invasive species. Many of the control strategies presented for species can be used for project maintenance as well as site preparation.

Hybrid cattail (*Typha glauca*)

Narrow-leaf cattail (*Typha angustifolia*)

Purple loosestrife (*Lythrum salicaria*)

Reed canary grass (*Phalaris arundinacea*)

Common buckthorn (*Rhamnus cathartica*)

Glossy buckthorn (*Rhamnus frangula*)

Common reed grass (*Phragmites australis,* syn. *P. communis*)

Canada thistle (*Cirsium arvense*)

Crown vetch (*Coronilla varia*)

Bird's foot trefoil (*Lotus corniculatus*)

Sweet clover (*Melilotus officinalis* and *M. alba*)

Wild parsnip (*Pastinaca sativa L.*)

Spotted knapweed (*Centaurea maculosa*)

OTHER CONSIDERATIONS

Spot treatment of weeds is commonly conducted in combination with other maintenance strategies such as mowing, prescribed burning and prescribed grazing that can help stress plants or decrease the leaf surface area required for herbicide coverage. Herbicide application tends to focus on removal of species that cannot be controlled by mechanical means effectively.

COSTS

The cost of herbicide application varies depending on site conditions, herbicide type, application equipment, whether a certified and insured vendor is needed and time of year. Costs can range from twenty to around one-hundred and fifty dollars an acre.

ADDITIONAL REFERENCES

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Best Management Practices for the Invasive Phalaris arundinacea L. (Reed canary grass) in Wetland Restorations, Reinhart, C.H., Galatowitsch, S.M.

Revegetation Practices in a Seasonal Wetland Restoration in Minnesota, Bohnen, J.L., Galatowitsch, S.M.

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