Solarization (plastic mulching)

Solarization uses plastic sheeting to trap heat and destroy the plants underneath, including the dormant parts of undesirable plants and part of the seed bank. It should not be performed repeatedly on the same site because this can negatively affect soil function and reduce native plant growth and biodiversity.

If the soil does not reach high enough temperatures, it risks enhancing undesirable plant growth instead of preventing it. This may occur if the sheeting is damaged or does not receive intense sunlight.

Prescribed burns

Prescribed burning takes advantage of the resilience of native boreal plant species to naturally occurring wildfire. It can be used to control non-native plant species over a large area, promote natural regeneration of native species, improve forest growth, manage pests and diseases, and create microsites for plant growth.

Fire intensity must be managed carefully for prescribed burning to be successful. A low-intensity burn can promote grass growth rather than suppress it, but a high-intensity fire risks liability and accidental damage if it burns out of control.

Strategies for reclamation success

Mechanical vegetation control is one component of a successful vegetation management plan. Methods should be selected according to a site's size, environmental sensitivity, undesirable species and available resources. Non-lethal techniques such as cutting, for example, are not appropriate for controlling prohibited noxious weeds, which must be destroyed in compliance with weed control legislation.

Many mechanical control techniques also expose microsites, which can be advantageous if the sites are immediately planted or seeded to ensure rapid return of desired plant cover. Careful monitoring is also necessary to identify problem areas and ingress of undesirable species, allowing for prompt and cost-effective interventions.

We would like to acknowledge COSIA's (Canada's Oil Sands Innovation Alliance) for their contribution to this project.

Aussi disponible en français sous le titre : Guide de la lutte mécanique contre la végétation

Cat. No. Fo4-126/2018E-PDF (Online) ISBN 978-0-660-26642-8

For more information, contact: nrcan.silviculturetoolkit-outilssylviculture.rncan@canada.ca

Natural Resources Canada | Ressources naturelles Canada

A Guide to Mechanical Vegetation Control

Achieving desired vegetation with manual and mechanical means

Ingress by undesirable vegetation can be an impediment to meeting reclamation objectives on industrial sites. Mechanical vegetation controls are a common component of an integrated vegetation management plan.

Canada

Mechanical control toolbox

TECHNIQUE	CULTIVATION	MANUAL REMOVAL	MECHANICAL CUTTING
			
Advantages	Damages weeds that reproduce from roots	Highly selective; effective for small infestations	Treats large areas quickly
Disadvantages	Requires repeated treatments	Costly and slow; requires repeated treatments	Requires repeated treatments

TECHNIQUE	MULCHING	SOLARIZATION	PRESCRIBED BURN
			
Advantages	Treats large areas	Long-term impacts	Treats large areas quickly
Disadvantages	Risks suppressing target vegetation	Risks damaging soils or promoting weeds	Difficult to manage the burn intensity and spread

Cultivation

Cultivation is performed by using ploughs, straight shank rippers, rip plows and hand tools to damage or destroy the roots of undesirable species. It is most effective for controlling undesirable annuals, winter biennials and/or species that reproduce from roots (e.g. Calamagrostis canadensis). These techniques should be performed two or three times over the growing season before plants go to seed, and in some cases, for several years. If cultivation is not repeated, the numbers of some undesirable species (e.g. rhizomatous species) may increase.

Manual removal

Manual removal is a costly and time-consuming method, most appropriate on sensitive sites and/or sites with small infestations of undesirable species. It should be repeated at least three times per year and may need to be repeated for several years. This approach is not well-suited for treating large infestations of undesirable species.

Mechanical cutting

Mechanical cutting refers to removing above-ground plant material by using a brush saw, chainsaw or mower. Careful timing is essential: it should take place before plants set seed and should be repeated two or three times over the growing season. Repeated treatments over several years may be necessary.

Mulching

Mulching is a common method to suppress the growth of undesirable species over a large area. It must be carefully managed to ensure that target species are able to grow while effectively suppressing undesirable species.

Organic mulches include wood chips, sawdust, bark chips, spruce or pine needles, or spray-on mulch.

Inorganic mulches include sand, gravel, pebbles, geotextiles, landscape fabrics, plastic sheets, burlap, polyethylene and polypropylene. While organic mulches may use on-site materials, inorganic mulches incur additional costs for transportation. However, typically they are more effective for long-term control. Non-degradable materials will need to be removed once the desirable vegetation is well-established.