

Novel approaches to meet reclamation targets

Cultural controls are a novel set of approaches to suppress undesirable vegetation while improving growing conditions for desirable forest regeneration. Companion planting, and potentially cover cropping, additionally increases the densities of native herbaceous species on reclamation sites, thus improving progress toward multiple reclamation targets (establishment of both woody and herbaceous native species).

All of the methods in the cultural control toolbox are being researched to test and improve their effectiveness. Ultimately, these techniques will be most effective as part of an integrated management plan that incorporates mechanical, chemical and/or other controls (e.g. biological). As with all vegetation control techniques, a thorough site assessment is important to determine whether cultural control is appropriate and which approach to use. Monitoring is necessary to evaluate whether follow-up treatment and/or planting is needed to meet reclamation targets.

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



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A Guide to Cultural Vegetation Control



Simultaneously managing
desirable and undesirable
vegetation

Cultural vegetation control is the targeted establishment of desirable species to displace or discourage undesirable species. Cultural control can be achieved using woody and non-woody species. In a fundamental sense, re-establishment of forest cover is a long-term cultural control. For more rapid control, native understory plant species are grown alongside planted trees and shrubs with two objectives: to establish early cover to delay and reduce growth of undesirable species and to improve the site's chances of achieving return to forest cover.

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Cultural control toolbox

TECHNIQUE	COVER CROPPING	COMPANION PLANTING	CLUSTER PLANTING
Advantages	Suppresses undesirable species and improves site conditions	Improves conditions for woody species; may reduce planting costs	Rapid growth and occupancy
Disadvantages	Low establishment rates of seeded native plants	Inappropriate companion species may compete with woody species	Limited field tests; trees may compete with one another within clusters

Cover cropping

In cover cropping, one or more native species, either woody or non-woody, are established (often by seed) across the entire site. As they grow, their purpose is to occupy growing space across the site, thereby preventing growth of undesirable species, without negatively affecting the growth of planted woody species. The cover crop may also protect planted species from temperature extremes and reduce soil erosion.

For cover cropping to be effective, the cover crop species should grow rapidly on the site, thus suppressing growth of undesirable species. Fireweed, goldenrod, asters, sedges and some native grasses are potential cover species. Seed selection and deployment needs to be well-planned to ensure success rates are acceptable. Seed deployment mechanisms (e.g. direct seeding techniques) to improve establishment rates are currently being investigated. In some cases, more advanced silviculture may be used as a form of control to manipulate stand succession and composition for specific management objectives.

Companion planting

The companion planting technique is very new, and research is underway to determine if it can be effective. White spruce planted with fireweed or showy aster, for example, has shown promise during preliminary trials but requires more extensive testing. If inappropriate companion species are used, they risk poor nursery growth and/or competing with the desired woody species they are meant to promote.

In companion planting, the idea is to grow one or more herbaceous native plants in the same container as a tree or shrub destined for the reclamation site. This technique might improve establishment by planting rather than seeding; it also reduces planting costs compared with planting two or more species in separate containers.

If it is to be effective, companion plant species must be carefully selected. A suitable companion species should not only prevent undesirable species from growing next to the planted tree or shrub – it should also provide protection for the (often shade-tolerant) woody plant and may be selected for its value to nearby Indigenous communities.

Cluster planting

Unlike cover and companion planting, cluster planting involves altering the planting pattern of woody species on reclaimed sites.

Conventional planting involves uniformly spacing woody species across the site at a low density (e.g. 1,500 to 5,000 stems/ha), leaving substantial bare soil, which is often quickly overtaken by undesirable species.

Conventional planting densities are usually determined for optimal fibre production. In reclamation and restoration, fibre production is often not the prevailing management objective, therefore, planting densities can be altered significantly.

In contrast, cluster planting arranges planted woody species in tight clusters (10,000 stems/ha or more) while maintaining a conventional overall density on the site (1,500 to 5,000 stems/ha). Undesirable species are less likely to become established within the clusters, allowing planted trees and shrubs to grow more rapidly. There is a risk, however, that clustered trees may compete for resources and experience suppressed growth. Alternatively, high stem densities are not uncommon following natural disturbances. There have been limited field studies to provide planting guidelines and test the effectiveness of this technique on reclaimed sites.