

Use of Glyphosate (Vision) Herbicide in Manitoba

What Is Glyphosate? Glyphosate is the name for the chemical herbicide sold under the name Vision and licensed for use in forestry applications. Glyphosate is commonly sold under the name Roundup for agricultural and residential use, and is the active ingredient in a number of other herbicide products. Vision is used in forestry to control broadleaf plants that compete with planted softwood seedlings. The glyphosate molecule works by blocking a plant enzyme that produces amino acids in a way that is specific to plants and some microorganisms. It works when applied to growing plants, but has **no residual herbicide action in the soil and no herbicidal action the year following treatment.**

The application will kill or suppress the hardwood (aspen, poplar, birch) seedlings, shrubs, grasses, and forbs that would otherwise outcompete the softwood (spruce and pine) seedlings. The softwood is left unharmed, because in late summer their needles develop a thick, waxy covering (called a cuticle) that keeps the herbicide from being absorbed.

Why is the control of broadleaf plants important? Based on renewal surveys, there has been a continued trend for harvested softwood areas to regenerate with an increased number of hardwood stems changing many of the renewed blocks to a mixed-wood stand from what was a softwood stand. When these mixed-wood stands develop they usually have a dense over-story of hardwood that generates heavy shade and restricts the growth of plants underneath.

Some of these harvest areas have been identified for treatment through the use of herbicides. The herbicide treatments remove many of the hardwood trees allowing for an increase in softwood seedling growth performance that helps the stand to regenerate to a softwood stand.

Part of Tolko's Sustainable Forest Management Plan is to conserve ecosystem diversity at the stand and landscape levels by maintaining the variety of communities and ecosystems that naturally occur in the region. The objective to achieve this is: *"Reforest all harvested areas to the previous forest cover type"*. Most of the stands that Tolko harvests are softwood.

The use of herbicides to meet this objective is imperative and cost effective. If these areas are left, to turn into hardwood stands the sustainable forest harvest level would decrease over time. This would mean lower harvest levels, which in turn could mean employee lay-offs.

The results of this method of management (herbicide application) are significant and positive. **In one long-term study, wood volume yield increased by 477 percent in test blocks that were treated with glyphosate.** A separate study found that the cost of a cubic meter of wood tripled when conifers were released by workers with brush saws, rather than by the aerial application of herbicide.

One report from Nova Scotia showed that 87 percent of conifer plantations failed outright when herbicide use was discontinued.

Submission Process for Herbicide Application:

- Field surveys or other inspections of regenerating forests to determine success in meeting provincial reforestation standards
- Identify blocks that have hardwood competition that is preventing the softwood from meeting the standard
- Aerial inspection of stands that have not meet either regeneration or free-to-grow standards in order to map specific areas that require herbicide treatment and identify concerns which may affect application
- prepare the proposed treatment areas-
 - Work permit submission
 - Aerial photography showing treatment area with applicable buffers and high wildlife value leave areas
 - GIS data for treatment blocks
- submit proposed treatment areas to the local Manitoba Conservation Integrated Resource Management Team (IRMT) for review and incorporate any changes such as additional buffers or wildlife leaves.
- prepare contract for the spray program
- submit public notices in community newspapers in vicinity of spray blocks
- submit documents for a pesticide application use permit from Environmental Approvals Branch (Manitoba Conservation)
- ensure applicator(s) have Manitoba pesticide applicators license
- train contractor in company Standard Operating Procedures (SOPs) including Herbicide Spill SOP, Herbicide application near water SOP, review permit requirements
- ensure compliance with Pesticide Use Permit and other Acts and regulations governing the use of pesticides
- Application records are submitted to Manitoba Conservation, Forestry Branches Integrated Forest Renewal Program

- submit 'Post Seasonal Report' to Environmental Approvals Branch (Manitoba Conservation)

Requirements for the pesticide use permit and report fall under Regulation 94/88 & 47/2004 of the Environment Act. Licensing of applicators and required applicators' records fall under The Pesticides and Fertilizers Control Act. Glyphosate is registered under Pest Control Products Act (Canada).

Requirements for buffers are outlined mainly in the Forest Management Guidelines for Riparian Management Areas and /or the Forest Management Guidelines for Terrestrial Buffers.

Herbicide Practices in Manitoba

The Companies herbicide program is done by low level application with licensed, experienced, aerial spray contractors using state-of-the-art equipment designed to minimize drift. Modern nozzle configuration produces uniform droplets and weather conditions are monitored so that herbicide is only applied under the conditions specified in the work permits and license conditions. These conditions include requirements of a minimum 30 m buffer to open water, not applying herbicide in conditions such as a temperature inversion or thermal convection currents. In addition Tolko's own Standard Operating Procedures limits herbicide application to conditions where the wind speed is not over 10 km/h as well as not applying herbicide when the temperature is over 30 deg. C and relative humidity less than 25% (conditions that might cause unintended drift).

Glyphosate (Vision) and Wildlife

Before any herbicide can be registered for use, the active ingredient must undergo a number of required studies to investigate the potential for unreasonable adverse effects to wildlife and other non-target organisms.

Tests are carried out for the effects on mammals, birds, aquatic animals, amphibians, insects, earthworms and soil organisms. Although, it has been found that there were no adverse effects to wildlife, habitat change resulting from herbicide use (due to the change in vegetation) can have a influence on composition of wildlife populations. That is, there can be changes in species found before and after treatments.

As the main reason for herbicide use by Tolko is to ensure the long term supply of softwood dominated forests it should be clear that **the benefit to wildlife will be the maintenance of large tracts of mature softwood forests in the future. Ensuring the presence of these forests will ensure habitat for locally important species such as martin and caribou remains for future generations.**

Furbearers

When used as directed there are no direct effects on furbearers from glyphosate use. Some studies, however, have shown temporary changes (increases or decreases) in small mammal (such as mice and voles) populations following herbicide application but after 18 months there

were no differences in the abundance of small mammals between either the treated or non-treated sites. It seems that herbicide treatments have little lasting effect on the prey population of most upland fur bearers such as marten, lynx or coyote.

Aspen (the target species of herbicide spray) is their preferred forage for beaver. Most beaver foraging occurs less than 91 meters from water but forage can be found up to 182 meters from water. Herbicide treatment is usually restricted to beyond 100 meters from water; hence, the majority of preferred beaver habitat is conserved.

Caribou and Moose

An increase in young aspen browse following logging can be an important food source for moose, as the aspen regeneration gets taller it becomes less suitable for moose browse. As Tolko generally treats areas ten or more years following harvest they have often passed the best browse stages for moose, however red osier dogwood is the preferred browse for moose and is resistant to glyphosate so it can often thrive after treatment and continue to supply moose browse for years. Where moose are actively managed portions of a block may be left untreated to preserve moose habitat.

Predation on woodland caribou young is a major factor limiting for the population. Woodland caribou historically used habitats with limited populations of moose and deer because those species attract wolves to an area. By avoiding areas where wolves hunt, caribou were able to reduce predation. In areas being managed for caribou the absence of vegetation management would result in increases of moose and wolves which would lead to increased mortality of caribou. **Effective vegetation management can separate caribou and moose populations for the benefit of caribou.**

Studies have shown that even if animals browse on freshly treated sites that the glyphosate passes safely through the animal and does not accumulate in the organs or meat, and the animals would be safe to eat.

Glyphosate (Vision) and Berries

Studies have shown that the risk to a person is considered extremely small in that **a person would have to eat at least 450 pounds of contaminated wild berries in one day to reach an exposure equivalent to the "No Observable Adverse Effect Level"** (NOEL) for animals and anticipated human exposure (Margin of Safety). The NOEL is the highest rate of exposure which produces no adverse health effects of any kind. In studies, the degree of exposure that could result from the consumption of sprayed berries is 1,623 to 9,300 times lower than the lowest NOEL.

For most individuals, the risks may be even smaller yet. Warnings may be posted in sprayed areas and this undoubtedly discourages berry consumption. Even if the warning is ignored, it is likely that the person would rinse or wash the berries before eating them. This would remove more than 80% of the glyphosate on the berries. Under these conditions, the risk of adverse health effects would be essentially zero.