

Advances in non-chemical weed control for urban landscapes

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In 2001, the Supreme Court of Canada recognized the authority of municipalities to enact bylaws on pesticide use, provided the aim is to protect “the health of its inhabitants” by restricting “non-essential uses of pesticides”. These “non-essential uses” include weed control in lawns, shrub beds and sidewalks, whereas “essential” pesticide use would be rodent management in buildings and protection of food crops. The Court’s decision led dozens of Canadian municipalities to enact pesticide reduction bylaws, and many school districts to voluntarily implement similar measures. The result was the removal of pesticide tools traditionally used by landscape managers in public agencies and private companies.

Pest management without pesticides is difficult for weeds. Prevention remains a cornerstone practice, for example paved mow strips under fence lines, mulches and ground covers in shrub beds, and sealing cracks in asphalt and concrete areas. Treatments based on mechanical control include hand weeding and use of mowers and string trimmers.

Newer non-chemical methods have been implemented to various degrees. The most widely adopted has been acetic acid, found in household vinegar. This “least-toxic” product is allowed for use by organic farmers and is an “acceptable” pesticide in most municipal pesticide bylaws. A commercial formulation is registered in Canada as a post-emergence herbicide. Weed control is rapid and excellent, especially at concentrations of 10% and 20% or with addition of 1% soap to help distribution on the target weed. However, the higher concentration can cause skin burning, the product controls only above-ground parts, and spray equipment must be thoroughly cleaned.

Another widely adopted tool is the hand-portable infra-red radiation equipment equipped with a propane cylinder. The application of intense heat for a few moments results in coagulation of albumoid compounds inside plant cells, interfering with photosynthesis and leading to plant death. The time of application is short, but large weeds require a second application, weed roots are not affected, and there is no residual activity.

A product developed in Eastern Canada based on *Sclerotinia minor* was registered in 2007 as a post-emergence herbicide for dandelion in turf. The naturally-occurring fungus invades the plant and secretes oxalic acid, which destroys above-ground tissue. Studies show 60% control when applied over growing dandelion, without impact on grasses. A commercial product is expected for 2010.

Two methods have not been widely adopted. Steam from hot water applied directly to weed foliage melts the waxy coating, resulting in loss of moisture and dehydration. The initial purchase is expensive, the equipment travels slowly, and the water reservoir requires frequent filling. Corn gluten meal is said to prevent seed germination for many weeds commonly found in turf areas. Commercial programs have not been successfully developed.