ONTARIO HYDRO AS A POTENTIAL USER OF TREE GROWTH REGULATORS[1]

by Geoffrey P. Arron

Abstract. Inconsistent results have been obtained after application tree growth regulators (TGRs). The most popular method of application (trunk injection) results in bark damage, wood staining, and bleeding injection holes, and the few economic analyses that have been reported suggest that only those trees that are expensive to trim and/or are trimmed on a short cycle are worth treating. Given the predominance of long trimming cycles in Ontario, the concern of the public over the use of pesticides, and the problems that arise after their application, the trunk injection of TGRs would not be a useful addition to the operational tree trimming program of Ontario Hydro.

Résumé. Des résultats contradictoires ont été obtenus après l'application de régulateurs de croissance (TGR). La plus populaire des méthodes d'application (injection du tronc) résulte en dommage à l'écorce, coloration du bois et coulée des trous d'injection, et les quelques analyses économiques qui s'y ont rapporté suggèrent que les seuls arbres qui sont coûteux à élaguer et/ou sont élagués sur un cycle court sont valables à traiter. Étant donné la prédominance de longs cycles d'élagage en Ontario, la préoccupation du public envers l'emploi de produits antiparasitaires et les problèmes qui surviennent après leur application, l'injection dans le tronc de régulateurs de croissance (TGR) ne serait pas un complément utile au programme opérationnel d'élagage d'arbres chez Hydro-Ontario.

The trimming of problem trees under or beside distribution lines on city streets and in rural areas is a major expense for electrical utilities. Such trimming is conducted on a three to eight year cycle depending on the individual species growth rate and the amount of line clearance required. Extensive studies have shown that tree growth regulators (TRGs) are effective in inhibiting the growth of woody and non-woody plants (for a review see 4) and therefore they could be extremely useful in an operational tree trimming program.

While trimming cycles in Ontario are usually long, there are a number of trees which are trimmed every three or four years. Some work has been conducted in Ontario to determine if TGRs could have a role in operational trimming (1, 2). In these and other studies (3, 5, 6, 7) the problems associated with the various methods of application of TGRs have been evident. For all application methods there have been instances of poor uniformity of response and differences in the response of the same species growing in different parts of North America. With bark banding there have been reports of bark damage (3) and with soil applications (basal drench or soil injection) there is concern over groundwater contamination and/or runoff. With trunk injection the problems of slow injection times, bark damage (lightning strikes), bleeding holes and staining of the wood have all been reported (2, 5, 6, 7). Questions concerning the re-injection of trees have not yet been answered. While trunk injection has been the most popular method of application of TGRs an alternative method which does not involve the use of alcohol carriers and pressure injection remains attractive. Such a method might be the insertion of capsules filled with a TGR. Some trees have been treated with flurprimidol and uniconazole capsules but there have been no reports of their effects on growth over the long term. Uniformity of response may be an important issue with capsules, although such an application method would appear to have advantages over trunk injection in that capsules would be quick and easy to apply, and the wound response might be less significant. Capsules would probably be a cheaper application method than trunk injection while retaining the advantage of a "closed system" in that the chemical is placed within the tree and not at the tree/soil interface (as with both basal drench and soil injection).

There have been few reports published on the cost effectiveness of TGR applications. Perhaps the most useful comes from a four-year study performed by Potomac Edison (6). With an average clearance of 2 m (6 ft) a trim only cycle of one year costing $41.80 per tree per year could be extended to a four year trim and inject cycle costing $15.54 per tree per year (annual savings of 63%). Similarly with a clearance of 4 m (12 ft) a

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four year trim only cycle costing $11.99 per tree per year could be extended to an eight year trim and inject cycle costing $9.23 per tree per year (annual savings of 23%). Thus with longer cycles the possibility of saving money is far less than with shorter cycles.

Two models of the cost savings associated with TGR use have been presented. Both were theoretical models which did not use cost data obtained from field studies with trees treated (or not) with TGRs (7, 8). Hydro Quebec (7) found that in the Richelieu district it would be economic to treat only a few trees (4,200 out of 254,000) in the district. Calculated savings of $15,000 per year on an operating budget of about $1 m per year would provide no justification for using TGRs. In a second model published earlier (8) Wagar reported that the sooner you can generate annual savings the higher the internal rate of return (IRR). Where other things are equal, the IRR will be highest where species respond quickly to TGRs, where trimming cycles are short, and where TGRs give the greatest extension of the trimming cycle. There would be no benefit in treating trees that are inexpensive to trim. It is unfortunate that there is an almost total lack of published data on the cost savings achieved through the use of TGRs on an operational basis.

In Ontario the use of pesticides has become an emotional issue as far as the public is concerned. In 1990 the Pesticide Act in Ontario was changed and posting/notification is now required 24 hours before application and 48 hours after. These changes could affect any future TGR applications. There are alternatives to the continued trimming of trees under distribution lines. Tree replacement provides a long term solution to the trimming problem. Trees and shrubs can be planted in the appropriate places on the owner's property enhancing the landscape and perhaps contributing to home energy efficiency. On the basis of these considerations and the problems associated with TGR use discussed earlier, there does not appear to be a place for TGRs in the Ontario Hydro vegetation management strategy at present.

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