Verification of Ecoplug use as a successful form of herbicide application in powerline clearance sites in Norrköping, Eastern Sweden.

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Introduction.

Since the winter of 1995 Norrköping Enviromental Energy AB (NME AB) have been using Ecoplug as a method for herbicide application on powerline clearance sites. Hundreds of kilometers of line have been cleared and stumps plugged with Glyphosate. On some sites, areas of untreated stumps have been left as a control to compare subsequent regrowth rates with those treated.
Lasse Jansson who manages vegetation control for NMB AB has used relatively unskilled labour for the work . Operatives hired from the Swedish State drug and alcohol rehabilitation programme are paid monthly to encourage thorough work and avoid the short cuts associated with piece rate labour.
The results in Norrköping have been extremely effective interms of reducing regrowth rates, making cost effective use of labour and chemical treatments, and having a more responsible and controlled approach to the environmental impact of herbicide use.
Three sites were inspected in the Norrköping area and regrowth rates recorded using Ecoplug data collection protocoll.

Method.

The sites visited were:

1. Kraft ledning gata Torshag , Åby, treated in August 1997.
2. Kraft ledning gata Viuddsvagen, treated in Dec 95/ Jan 96.
3. L2003 Kraft ledning gata Trostad, treated in October 1995.

Stump treatments inspected were from the following species:

Alder, Aspen, Birch, Elder, Oak , Scots pine, Norway spruce, Rowan, Whitebeam, Hazel, Crack willow and Goat willow.

The following information was recorded:

- Species
- Diameter of the stump.
- Number of plugs used.
- Type of application (whether hammar or drill were used to insert plug).
- % regrowth rate.

(See appendix data collection from field)
The inspections were made on April the 27th after a week of warm sun and temperatures of +24 C. Most understorey tree species were in leaf , birch were showing leaf. With other species it was possible to determine if healthy shoot growth was present by the size and condition of bud and twig. It is extremely easy to check if a stump has been treated with the right dose as plugs are coloured and quite visible.

Interpretation of field evidence.

Prior to visiting the sites to undertake inspections I was expecting that there would be a moderate quantity of regrowth and that random sampling along the entire length of the line would be needed to get representative evidence of the success or faliure of the plugs on individual species on each site.
The evidence in the field however is that in almost all species there is 100% supression of regrowth from stumps in contrast with untreated sites.On untreated sites after 3 years there is vigorous regrowth up to 2 m in height from Alder , Willow, Aspen , Birch and Hazel.
There were exceptions on treated sites in a small number of stumps and notably Elder re-grew vigorously on one site treated in August of 1997. It is impossible to tell whether this growing season the Elder will wilt and die and these stumps should be re-inspected in September of this year.
Re-growth in other species was clearly as a result of improper application of the plugs. Either stumps were left untreated or so long in length (over 30 cm) that the plant effectively walled off the toxin and sprouted just above the root collar. This occured only on Birch and Alder on one site treated in 1995.
Mishandled stumps occured in definable areas as did over dosing. Over dosing with plugs has cost implications and staff need to be careful not to use more than the required dose or treat trees such as pine and spruce that will not sucker. I can imagine that workers may be overzealous with applications at the start of the day and more conservative at the end of the day when tired or in short supply and are avoiding a long walk back to the vehicle to restock, they may be stretching out their supply of plugs to finish off an area.
I can also appreciate that snow or thick herbaceous vegetation may force workers to leave higher than normal stumps or miss stumps altogether. Ecoplug application is however far less affected by weather conditions than conventional spraying.
Oak stumps had very small amounts of re-growth which died in the following growing season.

Treatment of standing trees.

The poisoning of standing trees is less effective than stump treatment if dosages are kept at rates recommended for stumps. 15 year old aspen trees plugged in 1995 were severely stressed but still surviving after plugging in the stem at 50cm from ground level. Death occured only when plugs were put in root butresses or as close to the root as possible. Dissection samples taken in cross section and longditudinally along the length of the stem showed significant damage to the xylem tissue up to 3m away from point of application. Aspen did effectively restrict radial spread of glysophate so that around 30% of the sap wood remained fuctional and translocation could be maintained at sufficient levels for survival, all be it in a stressed state. In the unusual circumstances that one would wish to poison a standing tree it is probably necassary to use double the dose recommended for stumps at the root butressess or root collar.

Conclusions of site inspections and discussion.

- Ecoplug when used in accordance with manufacturers specifications is 99% effective in suppressing regrowth and suckering from the stumps of trees common to forests in Sweden.
- Ecoplug increases re- cut periods on powerline sites when compared to untreated sites reducing medium term labour costs to maintain power supply.
- Ecoplug is a cleaner application method than spraying, requiring less equipment and preparation. It is more user friendly for the forest worker and use of herbicide is more controlled and targeted than liquid application reducing the possiblity of accidental contamination.
- Ecoplug application is not affected by weather conditions such as heavy rain or high winds.
- From a management perspective it is easier to check correct and thorough treatment of stumps due to the bright colour of the plugs.

Lasse Jannson seems very satisfied with the results of Ecoplug treatment and will continue to use the product on powerline clearance sites. I personally use Ecoplug for the treatment of stumps in urban settings in my arboricultral contracting business. The clean direct injection of the herbicide into stumps in public areas and private gardens (with appropriate warning signs) is much preferable to liquid surface application from a safety aspect particularly if stumps are exposed to children and pets. Customers immediately recognise the advantages of clean direct injection of a toxic material and are more comfortable with this product than spraying.
I would like to see the plug shell made from bio-degradable materials rather than plastic, thousands of plastic shells left in the forest is perhaps not as environmentally sound as it could be.
The evidence in the field is clear and indisputable Ecoplug does what it claims , and does it well.

In the United Kingdom I would expect the professional market will react quite slowly to to Ecoplug. The use of sprayers for herbicide application is widespread and the cost per stump to spray appreciably cheaper although less effective. The majority of contactors are already equiped to spray, with staff that are trained and qualified to do so, most are reluctant to change existing systems. Private consumers, gardeners, and organisations that have a large amount of volunteer labour such as the National Trust and National Parks will find this product extremely useful for safe and efficient application of herbicide. Particularly for the control of Rhododendron in the west and Wales and the invasive Sycamore in woodlands in the south.
In terms of safety and controlled application of herbicides Ecoplug is a positive way forward.

NORRKÖPING
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REPORT CONTROL OF SPROUTS

After been using your product ECOPLUG during two periods of growth i can give you the following report.
We concentrated us to places were annual clear cutting earlier has been necessary. Around fences, transformer stations and in powerlines we have now after two years, seen that the method is working well.
The method ECOPLUG is now included in Norrköping Energi:s annual clear cutting procedure.

Best regards

Norrköping Energi

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