GROWTH INHIBITORS BY INJECTION[1]

by Henry H. Ezzard

Control of tree regrowth under power lines is a major problem and one of the power companies most expensive maintenance items. Therefore, the EPRI felt alternate means of controlling regrowth should be researched and developed. Each method of growth inhibitor application seems to have a specialized usage, as injection probably will have in the future. Two methods presently utilized to apply growth inhibitor is the foliage spraying of trees and the painting of cuts made immediately after trimming.

In 1974 Electric Power Research Institute (EPRI) RP 214, *New Methods and Chemicals to Control Tree Regrowth,* was funded with research and development contracted to the USDA Nursery Crops Research Laboratory, Delaware, Ohio. Thereafter the project has been commonly referred to as *Pressure Injection of Growth Inhibitor for Reduction of Regrowth in Trees.* A similar project, EPRI RP 380, *Bark Banding of Chemicals to Inhibit Tree Growth*, was conducted by the University of California, Department of Environmental Horticulture.

The first stages of the growth inhibitor injection project were as follows: 1) Select growth inhibiting chemicals (7 were initially selected), 2) Design and develop injection equipment, 3) Field test equipment and chemicals, and 4) Establish criteria for desired and acceptable results.

The first year of the project was not extremely promising in my opinion. Many chemicals were not effective in controlling regrowth, other chemicals were too strong, yet some did show promise. The injection equipment was too large, complicated, and lacked mobility; however, it was established that injected chemicals would move readily into a tree.

After the first year, however, a successful course was established. The following research and development criteria were chosen: 1) Design and develop a more portable injection unit, 2) Select several of the most promising chemicals and put into field use, 3) Utilize seedlings grown in the greenhouse for quick and continuous research, and 4) Study translocation and fate of chemicals.

Using the criteria above the project began to show promise. Injector size was reduced. Low volumes with high concentrations of a chemical mix were utilized. Smaller holes were drilled in trees with better results. Two chemicals, maleic hydrazide (*Slo-Gro*) and dikegulac (*Atrinal*), were chosen for their consistent inhibiting effect and lack of foliage distortion even at high rates. Fast-growing, high-trimming-cost species were chosen and injected. Length of effective control time, though different for the various species, was studied. Test plots were set up across the country. Most tests on equipment, chemicals, and growth control were better than expected, with developmental changes giving a more economical, efficient operation. Most problem species evaluated give favorable results with little aesthetic loss.

The initial program was started with a tractor mounted or truck-bed size injector, utilizing large volumes of chemical mix. The present injector is a 20 × 20 × 8-inch suitcase size model that operates on compressed air. The unit is periodically charged from a separate air tank. The injection unit weighs 40 lbs., ready to operate. A small hand powered syringe-type model can be utilized for limited injections. A normal rate of injected chemical should have an average cost of approximately 25-50 cents per 20-inch tree. This figure may vary with areas, tree species, or desired effects.

At present sufficient testing has been gathered to establish that tree growth can be inhibited economically with injection of growth inhibitor. Various geographical areas and species may require different rates of chemical for optimum

[1]Presented at the annual conference of the International Society of Arboriculture in Toronto, Ontario, Canada in August 1978.

results. With *Slo-Gro* and *Atrinal* it is presently felt that an average treatment can be made with little chance of tree mortality. (Rates slightly above average rarely results in death).

For the injection system to be utilized by arborists across the country, the following should be pursued: 1) Registration of *Slo-Gro* and *Atrinal* for injection. 2) Establishment of species that react favorably, and 3) Establishment of rates for various geographical areas.

Species of trees that have been tested and results of these tests are available in the Annual Reports 1974-1977 of EPRI RP 214, *New Methods and Chemicals to Control Tree Regrowth.* Again let me stress, optimum chemical volumes should be established for your area prior to treatment of valuable shade trees. Either *Atrinal* or *Slo-Gro* may be slightly better on a given species. Some species of trees that have been tested and seem to have favorable treatment potential are red maple, hybrid poplar, black locust, hackberry, white ash, shamel ash, red oak, pin oak, water oak, silver maple, sycamore, and eucalyptus.

Injection of growth inhibitor will not eliminate tree trimming programs. It will eliminate some other uses of growth inhibitors but should prove very beneficial in areas where equipment access is limited for trimming and brush disposal. Back property lines and screens show the most potential for injection. Round overs that get thicker and less aesthetically pleasing with each trimming show good possibilities.

Other arborists, I am sure, see other potentials. Hopefully this injection system and registered chemicals will be available for your testing and utilization in the future.

Georgia Power Company
Atlanta, Georgia

ABSTRACTS

Haller, John M. 1978. **Burls.** Am. Forests 84(5): 28-29.

Burls are abnormal growths of plant tissues, and are found on many trunks and limbs of trees. Externally, they take the form of globular or semiglobular swellings, sometimes fist-size or smaller; sometimes, when occurring on large trees, they can swell to four or five feet across or more. Burls are solid, not hollow like galls; they are produced by the accumulation of layers of cells, just as normal wood is produced, and they increase in size from year to year, just as normal wood does. Internally, the burl is sound and firm, and its grain is twisted and convoluted into fantastic patterns that are much prized by cabinet-makers. The cause of an individual burl is often never found. Essentially it is a disturbance in the hormonal dominance that makes growth proceed in an orderly manner. Among the things that are believed to initiate this disturbance are insects, bacteria, fungi, mistletoe, and mechanical wounding.

Kemmer, Harleigh. 1978. **Managing wall plants.** Grounds Maintenance 13(5): 22, 24, 26, 72.

Many landscape plantings feature espaliers and vines that use walls for support, or cascading plants that partially cover walls. The grounds manager must develop a program for proper wall plant care based on the particular requirements of plants grown in this manner. Trees, shrubs, vines, annuals, and herbaceous perennials can be used as wall plants. Espaliers are trained to grow on fences, arbors and cordons. Wall plants are either allowed to grow in a random pattern or are trained into specific shapes involving a solid mass or a formal or informal pattern. The style should be in keeping with the character of the surrounding landscape.