

# Pelleted herbicide provides double forestry benefits

UNIVERSITY PARK — Pelleted fenuron herbicides can convert low quality, slow-growing stands of oak-hickory timber into high yielding Japanese larch, leaving "cured on the stump" firewood, according to experiments at Penn State.

Robert D. Shipman, forest scientist in charge of the experiments, said the chief biological tool used in the trials was a non-volatile pellet about the size of an aspirin tablet, effective in killing unwanted low-grade hardwoods. Fast-growing two-year old Japanese larch seedlings were planted under the dying hardwoods.

"After 16 years, the survival, growth, and yield of Japanese larch was found to be directly related to herbicide rate, toxic effect on trees, and method of application," Shipman stated.

The seedlings were planted at a 6-by-6 foot spacing beneath the canopy of a low-grade, 55 to 60-year-old oak and hickory stand on the Allegheny Plateau near Philipsburg. Pellets were placed on the soil surface in grid, row, and broadcast patterns.

The best 18-year-old larch averaged 38 feet in height, 4.6 inches in diameter, and produced 17 cords of wood per acre. In growing these trees, fenuron herbicide pellets were applied in a grid pattern at an 11 pound-per-acre rate.

The poorest larch growth took place on plots not treated with the herbicide. After 16 years, these

trees averaged only 11 feet in height and one-inch diameter. Untreated plots produced only one cord of pulpwood per acre.

Equally important, Shipman said, is the additional yield of 18 cords per acre of dead, herbicide-treated red and white oaks that can be used by the landowner or sold as standing "cured on the stump" firewood. Several dead trees per

acre should be left to provide dens and nesting sites for wildlife, he suggested.

Japanese larch was chosen for stand conversion because of its nearly "deer proof" fast growth and high yields of wood per acre — useful as pulpwood, poles, or small sawtimber. If the terminal bud is eaten by deer, the tree produces a

new one — unlike planted red and white pine.

Larch is suitable for genetic improvement, it was noted. It hybridizes readily, has good wood quality, resists red pine canker and spruce budworm, and is adapted to a variety of soils.

Fifteen years ago, Shipman noted, most forest landowners were reluctant to attempt a stand

conversion from one species to another through cutting, planting, or weeding.

Today, however, investment in forest conversion has become more attractive to landowners, he commented. The change came with development of safe, effective, low-cost herbicides — and increased use of wood for fuel.

UNIVERSITY PARK — Trees vary greatly in their resistance to toxic elements in acid soils, experiments at Penn State indicate. In some cases, the ability to live and grow in toxic conditions can vary even within a species, according to Larry H. McCormick and Kim C. Steiner of the School of Forest Resources.

From their research, they advise landowners to replant acid soils with trees known to resist toxic conditions. Thus far they have found the European black alder, birches, oaks and pines to be fairly resistant to acid soil conditions.

They claim toxic concentrations of aluminum often develop in acid soils such as found in surface-mined coal areas.

"Improving the soil by applying lime and plant nutrients in fertilizers is effective but expensive and only temporary," McCormick observed. "As the lime and nutrients are exhausted, acid soils revert to their original condition," he added.

Tree species evaluated were

## Toxic resistance varies among trees

yellow, gray and paper birches; Scotch and Virginia pines; pin and red oaks; European black alder; autumn-olive; and a hybrid poplar clone (cutting) identified as NE-388.

"We measured aluminum resistance by comparing reduction in root elongation in a series of culture tanks in a greenhouse," McCormick explained. "By growing seedling plants in solutions, with and without aluminum, we were able to distinguish true aluminum resistance from inherent differences in growth rate."

Hybrid poplars in the experiments were extremely sensitive to concentrations as low as 10 parts of aluminum to one million parts of water. Autumn-olives

were also relatively sensitive, with essentially no root growth at concentrations above 40 parts of aluminum to one million parts of water.

European black alder, birches, oaks and pines were resistant up to 120 parts of aluminum to one million parts of water.

As for variation within species, both pin oak and paper birch showed large differences in resisting toxicity. Some genetic "families" of both pin oak and paper birch were not affected by aluminum, while root growth in others was reduced by as much as 60 percent.


The Penn Staters observed that different clones of hybrid poplar also vary in their resistance to aluminum toxicity. Of 22 clones

tested at low concentrations of aluminum, root growth was reduced anywhere from zero to 93 percent. Thus, selecting the most aluminum-tolerant clones for planting on acid soils is very important.


## Loan rate established

WASHINGTON, D.C. — Commodity and farm storage loans disbursed in May by the U.S. Department of Agriculture's Commodity Credit Corporation will carry a 10-7/8 percent interest rate, according to CCC Executive Vice President Everett Rank.

The new rate, up from 10-3/8 percent, reflects the interest rate charged by the U.S. Treasury in May, Rank said.



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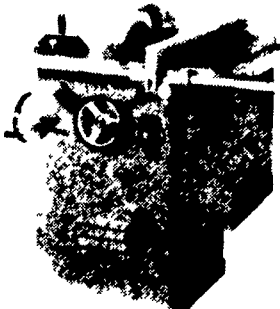
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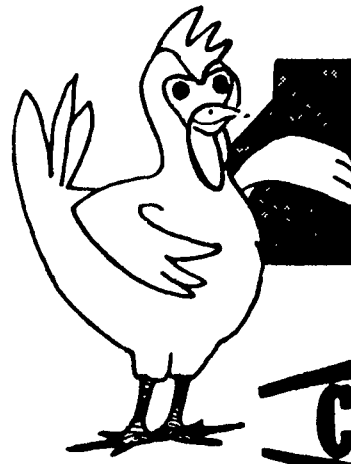

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