Genetic information needed for metropolitan trees

Progressive arborists and nurserymen have demonstrated impressive gains from exploiting genetic variation in certain characteristics of street trees. But the authors of a recent report suggest it is time for a more comprehensive approach, not only to make fuller use of these gains, but to achieve even greater genetic progress.

The report was prepared at Pennsylvania State University by H. D. Gerhold, professor of forest genetics; A. J. Long, former assistant professor of forest genetics; and M. E. Demeritt, former research assistant.

"The metropolitan regions of the Northwest offer diverse, and increasingly inhospitable, environments for trees," their report says. "Stresses include not only the familiar ones — adverse soils, droughts, freezes and disease organisms — but also other insults that accompany urbanization such as air pollutants and deicing salts. Only fragmentary information is available about the effects of such stresses on the health of various species and clones, and little is in a form that can be readily applied."

They set up a genetic information system, with the principal components including:

- Taxonomic categories — species, varieties, clones.
- Tree characteristics — appearance traits, adaptive traits.
- Environments of trees — hardiness zones, planting situations, urban stresses, diseases and insects.
- Organizations — municipalities, highway departments, nurseries, seed companies, government and university research agencies, arboreta.

They saw the principal functions of the genetic information system as follows:

- To organize performance tests of important trees at representative geographic locations.
- To obtain performance test data periodically on important characteristics from cooperating specialists.
- To interpret performance data and other pertinent data, transforming it into practical predictions of tree qualities in various environments.
- To distribute performance predictions periodically to cooperating individuals and organizations.
- To analyze for nurserymen trends in planting rates of species and clones.
- To analyze for breeders relative needs for improving various characteristics.

They surveyed arborists and nurserymen and several dimensions of metropolitan tree planting in 13 northeastern states were defined. About 100,000 trees were planted annually from 1962 to 1972 along highways in this region and about 200,000 were planted by municipal agencies — together an investment of $12 million.