THE PACK FOREST PLAIN: ONE OF NORTH AMERICA'S OLDEST FOREST FERTILIZATION EXPERIMENTS

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In 1928, Svend Heiberg—one of the first foresters and soil scientists to practice, teach and conduct research on forestry in the United States—led the establishment of a series of conifer plantations that have been regularly used for scientific inquiry of forest nutrition, stand development, biogeochemistry, and silviculture. The 50-hectare collection of plantations— mostly red pine (*Pinus resinosa* Ait.) located on a glaciofluvial outwash sandplain ("The Plain") on the Charles Lathrop Pack Demonstration Forest in the southeastern Adirondacks of New York—were amended with organic matter or fertilized with various amounts and combinations of N, P, and K from 1935 to 1956, making the site one of the oldest forest nutrition trials in North America. Early on in the research, The Plain was discovered to have severe K deficiencies for growing red pine and other species, so studies focused on K nutrition and its interaction with other site resources, including water and light. Some of the first practice and theory papers on forest fertilization in North America were produced by Heiberg and others, including many of today's top soil scientists who worked on The Plain as students in the 1940s-1960s. In the 1970s and 80s, the long-term research sites were used by Heiberg-descendants (including Drs. Al Leaf and Ed White) to study biogeochemistry in association with plantation development (aggradation) and concern for acidic deposition effects in forest ecosystems. Results are featured in Brady and Weil's seminal textbook on soils ("The Nature and Property of Soils", 12th and 13th editions). Research work has continued to present with a growing record of information on changes in tree communities and soil chemistry. Future research will hopefully continue along these lines of inquiry, and would focus on sustainability of conifer plantations, site amelioration of degraded soils using plantations, acidic deposition and its changing influence on site quality in the Adirondacks, and plantation forestry as related to long-term carbon dynamics.

Select bibliography (selected from over 50 refereed articles from research on The Plain):

Buxbaum, C.A.Z.; Nowak, C.A.; White, E.H. 2001. **Long-term soil nutrient dynamics and lateral nutrient movement in fertilized and unfertilized red pine plantations.** Biogeochemistry. 55: 269-292.

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