Section 3 Abstracts: Chestnut Tree Breeding, Propagation and Physiology

Effects of Light Intensity on *Castanea sativa* Nut Growth.
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Several fruiting branches of *Castanea sativa* of identical age and uniform growth were shaded at successive 15-day intervals from sprouting (24 May) to fruit set (5 August). The branches were covered with black plastic netting, which reduced sunlight intensity by 25%. Unshaded branches were used as control. There was a significant reduction in nut size for all the shaded branches in comparison to control. In addition, the leaves of the shaded branches, were larger, had a lower dry matter and dry weight/cm^2. In spite of a generally higher chlorophyll content, net photosynthesis was found to be significantly lower. These findings suggest that the negative effect exerted by shading on nut size may be due to the drop in net photosynthesis, which is not offset by the greater average leaf area and by the higher chlorophyll content. Since the control branches were on the same plant, and in the immediate proximity of the shaded ones, it may even be inferred that the light intensity reduction has a localized effect and that the surrounding areas of the canopy play no role in reducing that effect.

Then, small (< 1 ha) plots could be established to determine parameters related to the establishment of populations of H strains. These include the rate of growth of chestnut trees and their density and size when treated, canopy structure, blight incidence, duration of treatment, and the type and mixture of H agents. Such experiments would take 5-30 yr each. They would establish what degree of blight control is possible. It would be necessary to determine the frequency of the various vegetative or conversion compatibility groups in the fungus population before the experiments were started.

Molecular biologists could assist such efforts by developing rapid, inexpensive methods of determining vegetative compatibility groups (with markers) and the occurrence of H agents (using probes) suitable for large sample numbers. It would be helpful also, to classify the various H agents more rigorously.

The key contribution of the Scibilia-Shain procedure is that is provides a method of optimizing the components of a spray mixture before it is taken to the field for exposure to natural inoculum. Thus, once 1 ha field experiments began, one could concentrate on optimizing parameters related to field experiments rather than optimizing both spray parameters and field parameters simultaneously.