Addendum
History of the Stanislaus - Tuolumne Experimental Forest--1955-1982

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Recent studies 1955-1982
Stanislaus - Tuolumne
Experimental Forest

A considerable amount of forest disease research was begun on the experimental forest and in the surrounding Stanislaus National Forest in the late 1950's. Much of the pathology research at that time involved investigation on the parasitic mistletoes and root diseases that infect conifers.

Dr. Robert Scharpf at PSW and Dr. J. R. Parmeter Jr. at UC began their cooperative studies on the biology and pathology of dwarf mistletoes on true firs. These studies have continued over the years and are still in progress today. Their work has resulted in numerous scientific papers and reports that have lead to a better understanding of the biology and control of these damaging pathogens in fir forests.

Clarence Quick also used the Stanislaus Experimental Forest as one area for his tests of chemical control of dwarf mistletoes on firs and pines. Although Quick tested numerous materials for several years, he was not able to successfully develop an operational chemical control for dwarf mistletoes.

Dr. Willis W. Wagener also studied the leafy mistletoe that infects white firs in the area. In the 1950's he reported that cold was the factor that limited the range of this mistletoe to about the Stanislaus National Forest and Southward. In addition Dr. Wagener and Dr. Robert Bega studied the internal temperatures of large firs that led to the laboratory tests of optimum growth of heart rot fungi.

In the early 1960's 2 scientists, Richard Hull and Dr. Oliver Leonard, from the University California, Davis used the experimental forest for their studies on the physiological aspects of parasitism in mistletoes. Their work involved studies of photosynthesis and carbohydrate movement in the parasite and hosts through the use of the radioisotopes carbon 14 and phosphorus 32. Their studies, which resulted is several scientific papers, were aimed at clarifying some of the metabolic and translocation processes in the parasite and host that might lead to successful chemical control of these damaging organisms.

Other mistletoe studies conducted on the forest were undertaken by Leonard Felix, graduate student at University California, Berkeley. Felix's work, which resulted in a PhD thesis and several publications, involved studies on the biology of the leafy mistletoe, that infects and damages white fir.

Recent studies on the forest by Dr. Art McCain, extension plant pathologist, Dr. J. R. Parmeter Jr., University California, Berkeley and Robert Scharpf involve control of mistletoe in incense cedar by trunk injection of phenoxy herbicides.

Dr. Fritz Went, plant physiologist of the Missouri Botanical Garden in the 1960's visited the forest and set up a portable, "air pollution monitoring van" to study the "hydrocarbons produced by forests" of the area.

In the 1970's some of the studies by Scharpf on cytospora canker associated with dwarf mistletoe on true firs were conducted on the experimental forest and surrounding areas. These studies helped point out the prevalence of this fungus in dwarf mistletoe infected stands.

Studies by Bega in the late 50's on the microclimatic limits of white pine blister rust led to the reduction and final end of ribes eradication in California. Many of the studies were conducted on the experimental forest as well as the rest of the state.

Dr. Richard S. Smith Jr. and Bega planted several acres of sugar pine seedlings as part of their study of regeneration diseases carried from the nursery to outplanting sites. They also resowed the nursery on the lower tract, in the 1960's to study climatic effects of root pathogens on hot, exposed sites. This was the first time the nursery was used in several years. They also determined the survival of Macrophomina and Fusarium under a forest environment and monitored soil temperatures at various depths to determine pathogen survival temperatures.

Mortality plots on the experimental forest were surveyed from 1977-81 by Dr. George Ferrell (entomologist) which contributed to the data base used to develop risk-rating systems for mature true firs.

R. V. Bega was in charge of the administrative site from 1962-1969.

Pertinent literature from the late 1950's to the present is:

Parmeter, John R., Jr., and Robert F. Scharpf. 1963. Dwarfmistletoe on red fir and white fir in California. J. For. 61:371-374, illus.
Field observations and cross-inoculation studies show that there are two specialized forms of fir dwarfmistletoe, one attacking only red fir and one only white fir.

Parmeter, John R., Jr., and Robert F. Scharpf. 1963. Some characteristics of dwarfmistletoe populations on red fir. Phytopathology 53:885.
Differences in fruiting and mortality among infections on trees from different areas suggest that different populations may vary in these respects.

Quick, Clarence R. 1964. Experimental herbicidal control of dwarfmistletoe on some California conifers. U.S. Forest Serv. Res. Note PSW-47, 9 p., illus. Pacific Southwest Forest and Range Exp. Stn., Berkeley, Calif.
Results from spray applications of many phenoxy herbicides and some other materials showed that an isooctyl ester of 2,4,5-trichlorophenoxy butyric acid was the most promising herbicide tested for direct spray treatment.

Scharpf, Robert F. 1964. Cultural variation and pathogenicity of the colletotrichum blight fungus of dwarfmistletoe. Phytopathology 54(8):905-906.
Study describes the cultural differences among isolates of the fungus and discusses host affinities determined from cross inoculation tests.

Scharpf, Robert F., and John R. Parmeter, Jr. 1966. Determining the age of dwarfmistletoe infections on red fir. U.S. Forest Serv. Res. Note PSW-105, 5 p., illus. Pacific Southwest Forest and Range Exp. Stn., Berkeley, Calif.
Suggests that dwarfmistletoe can be aged rapidly and reliably by counting the number of annual rings showing swelling and then adding 1 year for the lag period between infection and swelling.

Scharpf, Robert F., and John R. Parmeter, Jr. 1967. The biology and pathology of dwarfmistletoe Arceuthobium campylopodum F. abietinum, parasitizing true firs (Abies spp.). U.S. Dep. Agric. Tech. Bull. 1362, 42 p., illus.
Compares the behavior of dwarfmistletoes on red fir and white fir with that observed for other hosts, and helps clarify some disputed aspects of the biology and pathology of dwarfmistletoes.

Scharpf, Robert F. 1969. Cytospora abietis associated with dwarf mistletoe on true firs in California. Phytopathology 59(11):1657-1658.
Geographic location and age of dwarf mistletoe were not important factors influencing infection by C. abietis.

Scharpf, Robert F. 1969. Dwarf mistletoe on red fir . . . infection and control in understory stands. USDA Forest Serv. Res. Paper PSW-50, 8 p., illus. Pacific Southwest Forest and Range Exp. Stn., Berkeley, Calif.
Height of understory trees was found to be the most important factor related to both percentage of trees infected and intensity of infection.

Smith, Richard S., Jr., Robert V. Bega, and Jerry Tarry. 1966. Additional hosts of Fomes annosus in California. Plant Dis. Rep. 50(3):181.
Fomes annosus was found attacking and killing five new hosts, Pinus patula, Abies bracteata, Archtostaphyllos viscida. Archtostaphyllos manzanita, and Artemisia tridentata.

Smith, Richard S., Jr. 1967. Decline of Fusarium oxysporum in the roots of Pinus lambertiana seedlings transplanted into forest soils. Phytopathology 57(11):1265.
After four years Fusarium oxysporum-a fungus which causes a root disease of pines in forest nurseries but which is not normally present in forest soils-had declined to the point where it was no longer detectable.

Smith, Richard S., Jr. 1970. Borax to control Fomes annosus infection of white fir stumps. Plant Dis. Rep. 54(10):872-875.
All three borax treatments reduced infection significantly, but the dry powder application of borax was the most effective.

Toussoun, T. A., W. Menzinger, and R. S. Smith. 1969. Role of litter on the ecology of Fusarium in conifer forest soils. Phytopathology 59(10):1396-1399, illus.
The general absence of Fusarium could be attributed to germination of chlamydospores and destruction of germ tubes before new chlamydospores are formed.

Wagener, Willis W. 1957. The limitations of two leafy mistletoes of the genus Phoradendron by low temperatures. Ecology 38(1):142-145.
Reports the killing of leafy mistletoes in western juniper and white fir by extreme cold thus supporting the idea that the distribution of these mistletoes is affected by low temperatures.