Planting dates for

Douglas Fir Seedlings

in California forest lands

Edward C. Stone, Ed E. Gilden, D. W. Cooper, and Robert J. Malain

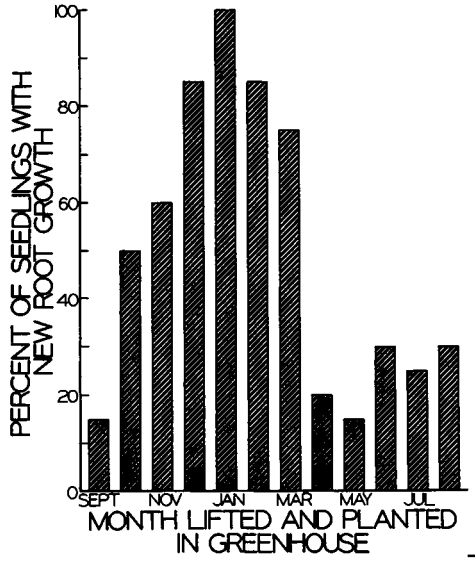
About one out of every four acres of producing forest land in the north coast counties of California is owned by livestock ranchers and farmers.

For many years some ranchers and farmers have considered their forest land as an area to be cleared for other uses. Other owners have harvested the timber and waited for natural regeneration to reproduce the stands but brush comes in more often than trees. Where the brush has been removed and trees planted, many of the young trees have died before the end of the first year.

Christmas tree growers trying to establish Douglas fir plantations on a wide variety of sites have had limited success. Some of the difficulties encountered are the result of inadequate site preparation, poor planting technique, and deer depredation. The condition of the planting stock and its failure to regenerate a new root system rapidly after planting have contributed to poor tree stands on some plantations.

A long-term evaluation of the root-regenerating potential of Douglas fir planting stock, commonly used in California, is in progress. It appears there are major changes in the rapidity with which a root system is regenerated. A seedling planted at one time of the year regenerates a new root system faster than a seedling planted at a different time, even though the availability of soil moisture and the soil and air temperatures do not differ significantly.

Percent of Douglas fir seedlings showing root growth 0.5″ or longer during one month in the greenhouse, after transplanting on the dates indicated.



Seedlings were dug from the nursery each month and replanted in the greenhouse the same day in galvanized containers filled with sandy loam—ten seedlings in each container. The soil was thoroughly watered, and excess water was drained off through a stopcock at the bottom of the container. Each container was then suspended in a water bath maintained at 68°F. Watering and subsequent draining were repeated several times during the ensuing month.

Prior to replanting, roots were pruned back to approximately 8″ in length. Any white, actively growing root tips more than ¼″ in length, not broken off during the lifting process, were removed to simplify recognition of new root growth during the test month.

Thirty days after the seedlings were replanted, the galvanized containers were removed from the water baths and turned on their sides, and the seedlings were carefully washed out with a fine stream of water. Roots that had grown ½″ or more during the month were counted and measured. At the 68°F. root temperature used, enough roots grew ½″ or more in length to make comparisons significant.

Preliminary results, shown in the graph in column 1, indicate that, to take advantage of the high root-regenerating potential—which extends over a four months period—planting should be done after the middle of November and before the middle of March. The practice of early fall planting of Douglas fir seedlings in California involves risk of loss, and a shift to winter and early spring planting should be favorable to better root growth.

In general, winter planting also would assure better moisture conditions. When early fall rains are followed by a month or more of dry weather, as frequently occurs in California, the seedling roots suffer a moisture deficiency and the tops tend to dry out. After December, the chances of long periods of drought during the rest of the winter and early spring are greatly reduced. Field plantings made in tests in the Jackson State Forest near Fort Bragg, on timber land near Eureka, on the Hoopa Indian Reservation west of Weaverville, and in the Contra Costa Hills near Berkeley demonstrated the importance of recognizing both the root regenerating potential and the local climate. Results are shown in the table.

Survival of seedlings varied considerably from place to place and could be expected to vary from one year to the next. In all four test areas, April was too late to plant and in one area, September and

Concluded on next page

First Year Survival of Two- and Three-Year-Old Douglas Fir Seedlings

Contra Costa Hills		Hoopa Indian Reservation		Jackson State Forest		Timber Land near Eureka	
Planting date 1956–57	Survival %	Planting date 1957	Survival %	Planting date 1957–58	Survival %	Planting date 1957–58	Survival %
Sept. 18	0	March 7	39	Nov. 15	69	Dec. 18	71
Oct. 16	0	March 25	45	Dec. 15	89	Jan. 15	75
Nov. 14	51	April 27	8	Jan. 17	88	Feb. 4	90
Dec. 17	67			Feb. 14	94	March 22	92
Jan. 15	89			March 19	81	March 27	92
Feb. 17	95			April 24	44	April 16	58
March 18	85						
April 13	25						

NEW PUBLICATIONS

ready for distribution

Single copies of these publications—except Manuals and books—or a catalog of Agricultural Publications may be obtained without charge from the local office of the Farm Advisor or by addressing a request to: Agricultural Publications, 207 University Hall, University of California, Berkeley 4, California. Make checks payable to The Regents of the University of California.

HOME VEGETABLE GARDENING, by John H. MacGillivray, Cir. 499.

YOUNG-GROWTH TIMBER TAXATION IN MENDOCINO COUNTY, by Henry J. Vaux, Bul. 780.

Penalty for private use to avoid payment of postage, $300

University of California College of Agriculture, Agricultural Experiment Station, Berkeley 4, California

Paul J. Sharp.
Director

Free—Annual Report or Bulletin or Report of Progress
Permit No. 1127

SEEDLINGS

Continued from preceding page

October were too early. On the Hoopa Indian Reservation, where rainfall is often sporadic after the first of March, spring planting appeared hazardous.

Seedling survival is an integrated expression of the effect of the root-regenerating potential, planting site conditions, and the weather. The best planting time depends on the local climate but should be done when the root-generating potential is high.

Edward C. Stone is Associate Professor of Forestry, University of California, Berkeley.

Ed E. Gilden is Extension Forester, University of California, Berkeley.

D. W. Cooper is Farm Advisor, Humboldt County, University of California.

Robert J. Malain is Assistant Forest Manager, Jackson State Forest, California Division of Forestry.

LYGUS BUG RESISTANCE

Lygus bugs attacking seed alfalfa in parts of the San Joaquin Valley have developed a tolerance to the insecticides DDT and toxaphene. The development of tolerance apparently has been due, in part, to a selection of resistant strains resulting from the repeated use of those two insecticides.

Also, there is a seasonal increase in insecticide tolerance during the growth of the seed crop. The relationship of the seasonal resistance to the acquired resistance has not been determined but it is possible the two are unrelated. Lygus bugs taken from alfalfa seed fields late in the season are more tolerant of DDT and toxaphene than those at the beginning of the seed season.

An investigation of factors involved in the seasonal change in tolerance of one species of lygus bug has shown a positive relationship between total lipids or fats occurring in the insects and susceptibility to DDT. Seasonal changes in DDT susceptibility of bugs from seed fields show a strong correlation with seasonal changes in the total fat content of the bugs. The increase in fat and tolerance to DDT coincides with the formation of seed upon which the insects prefer to feed.

Male lygus bugs are more susceptible to DDT than females but these differences do not correlate with total quantities of fats found in the two sexes.

The insect fats are being studied qualitatively to determine if there are seasonal changes in the composition of the fats and if these changes can be correlated with insecticide tolerance.—*Oscar G. Bacon and Walter D. Riley, Dept. of Entomology, Davis.*

DONATIONS FOR AGRICULTURAL RESEARCH

Contributions to the University of California, Division of Agricultural Sciences

BERKELEY

Calaveras Land & Timber Corporation $500.00
For study of the nitric acid pulping process

California Redwood Association $50.00
To assist in studies of wood fasteners

National Science Foundation
For electron microscope research on problems of soils and plant diseases $42,000.00
For research on the relation of tryptophane metabolism to carbohydrate metabolism $3,000.00

Olin Mathieson Chemical Corporation $1,250.00
To study the effectiveness of Terraclor as a soil fungicide

Union Lumber Company $300.00
For studies on the drying of redwood

U. S. Public Health Service
For research on photosynthesis $27,814.00
For environmental and nutritional studies on virus vectors .. $28,555.00
For research on postembryonic development of certain nocturnal parasitic wasps $500.00

DAVIS

Amchem Products, Inc.
For fruit-thinning experiments with 3-CP $700.00
For research on herbicides $3,000.00

California Planting Cotton Seed Distributors $6,036.00
For research on control of nematodes affecting cotton

Can Manufacturers Institute, Inc. $4,500.00
For research on canned tomato paste

Commercial Solvents Corp. $375.00
For research in animal husbandry

Grower-Shipper Vegetable Association
For research on vegetable crop insect problems in the Salinas area $6,272.00
For lettuce breeding program $7,008.00

Hoffmann-LaRoche, Inc. $5,000.00
For research on vitamin A levels in liver

Sequoia Nursery ..... 145 field-grown miniature roses
For research on growth under varied intensities of sunlight

Shell Chemical Company
For research in plant nematology $500.00
For research in entomology and parasitology $2,000.00

Union Carbide Chemicals Company $300.00
For entomological studies with Sevin in vineyards

RIVERSIDE

American Cyanamid Company $1,500.00
For study of new insecticides

American Potash & Chemical Corp. $500.00
For agricultural air pollution research program

Carnation Company $3,500.00
For research on pesticides

Chemagro Corporation $3,000.00
For tests with Chemagro experimental insecticides

Collier Carbon and Chemical Corporation
2 tons ammonium sulfate fertilizer
For vegetable fertility experiments in southern California

Fillmore Citrus Protective District $900.00
For research on the culture of red scale parasites

Nutrilite Products, Inc. $1,000.00
For research on biological control of insects

Shell Chemical Company
For research in plant nematology $500.00
For research in entomology and parasitology $2,000.00

Union Carbide Chemicals Company $750.00
For studies in vegetable insect control

U. S. Public Health Service $17,257.00
For aquatic midge investigations in southern California