fir report

FIR - Forestry Intensified Research

Vol 1, No 1, April 1979

SERVING SOUTHWEST OREGON THROUGH ADAPTIVE RESEARCH AND EDUCATIONAL PROGRAMS

"FIR REPORT" is a quarterly publication containing information of interest to individuals concerned with forest management in southwest Oregon. It is mailed free of charge upon request. Requests should be sent to: FIR REPORT, 1301 Maple Grove Dr., Medford, Oregon 97501.

FIR Report communicates recent technological advances and adaptive research pertinent to southwest Oregon and alerts area natural resource specialists of upcoming educational events. Comments and suggestions concerning the content of "FIR REPORT" are welcome and should be sent to the Maple Grove address. For the FIR Staff

Stephen D. Hobbs
Extension Reforestation Specialist

inside ...

Agriculture, Home economics, 4-H Youth, Forestry, Community Development, and Marine Advisory Programs, Oregon State University, United States Department of Agriculture, and Oregon Counties cooperating

EXTENSION SERVICE
Corvallis, Oregon 97331

Oregon State University

FIR: AN OVERVIEW

In October 1978, the Southwest Oregon Forestry Intensified Research Program (FIR) became a reality with the arrival of Oregon State University School of Forestry Scientists to Medford. The FIR team consists of Steve Hobbs - Reforestation Specialist, Dave McNabb - Soil and Watershed Specialist, and Ken Wearstler - Silviculture Specialist. A harvesting specialist will be added to the team in the future.

Faced with a shrinking commercial forest land base and chronic reforestation problems, southwest Oregon forest resource managers, elected government officials, scientists from the U.S. Forest Service and the Pacific Northwest Forest and Range Experiment Station, and Bureau of Land Management officials joined Oregon State University School of Forestry administrators in formulating FIR. The program is funded by the timber industries of southwest Oregon, by Curry, Douglas, Jackson, and Josephine Counties, and by the Bureau of Land Management and the U.S. Forest Service. An advisory council composed of members representing each of the cooperating organizations periodically reviews FIR plans and progress and provides guidance to the School of Forestry on matters pertaining to FIR activities.

This ten-year program is designed to assist region foresters and other specialists in solving complex biological and management problems unique to southwest Oregon. FIR team members will organize, coordinate, and conduct educational programs and adaptive research projects specifically tailored to meet regional needs. FIR scientists will concentrate their educational and research efforts on six areas:

(1) artificial regeneration technology

(2) reforestation systems

(3) stand conversion and brushfield reclamation

(4) improved growth and yield information

(5) improved road location, construction and maintenance technology, and

(6) forest soil management.

Although the scientists will function as a team with integrated disciplines or areas of specialization, each one has been given primary responsibility for one or more of the six problem areas.

To gain additional insight and first-hand knowledge about these problems, FIR specialists recently held a series of problem analysis workshops in Medford, Grants Pass, and Roseburg. They also spent many hours in individual discussions with industrial and agency foresters, engineers, soil scientists, and hydrologists. Much valuable information regarding priorities for adaptive research and educational needs resulted from these discussions and is being incorporated into the FIR program.

One of the most important and useful functions of the FIR program will be to serve as a forum for information dissemination and the exchange of ideas between natural resource specialists in southwest Oregon. FIR specialists will also serve as communication links between this region and the scientists in Corvallis to ensure a two-way flow of ideas and information. Southwest Oregon represents an area of diverse and unique forest ecosystems that reflect some of the most challenging management problems faced by foresters anywhere in the Pacific Northwest. The FIR staff welcomes the opportunity to cooperate with the forestry community in search of practical solutions of forestry problems in Southwest Oregon.

THE FIR STAFF

Steve Hobbs, REFORESTATION

Dave McNabb, WATERSHED

Ken Wearstler, SILVICULTURE

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current research

STRIP CLEARCUTTING

Roseburg Lumber Company researchers have been attempting to improve reforestation success for a number of years. Recently, they have succeeded in obtaining acceptable levels of seedling stocking on droughty sites on southern and western exposures with slopes ranging between 50 and 65 percent.

Narrow strip clearcuts, 150 to 300 feet wide were logged and the areas planted with 2-0 bare root Douglas-fir and ponderosa pine in 1976. No site preparation procedures were applied other than that resulting from the harvest operation.

The sites were later sprayed with a mixture of 4#/acre atrazine and 4#/acre dalapon for grass control. Two years later seedling survival was good although deer browsing had been heavy. Trees are now protected with VEXAR leader protectors.

Given the severe reforestation problems we have on south slopes, strip clearcuts coupled with micrositе planting deserves a closer look.

S. H.

SOIL COMPACTION

Hank Froehlich, OSU Forest Engineering Department, recently received a grant from the U.S. Forest Service Equipment Development Center in Missoula, MT, through the PNW Forest & Range Experiment Station to examine soil compaction. The study will predict the amount of soil compaction occurring from skidders, tractors, and low ground pressure equipment on the same site. It will be conducted on several different soil types in northern California.

D. M.

SOIL FUMIGATION IMPROVES SURVIVAL AND GROWTH OF OUTPLANTED SEEDLINGS

Glen Klock, Pacific Northwest Forest and Range Experiment Station, Wenatchee, WA, has examined the response of seedlings to soil fumigation. A small experimental area on the Wenatchee National Forest was fumigated with methyl bromide and 2 percent chloropicrin at a soil depth of 60 cm, and bare root 2-0 Douglas-fir and ponderosa pine seedlings were planted.

After five growing seasons, seedling incremental height growth for both species was nearly 250 percent greater on fumigated plots compared to unfumigated plots. Douglas-fir survival was 90 percent and ponderosa pine 92.5 percent compared to 22.5 percent and 80.0 percent on the control plots.

Although this procedure is not recommended for operational use, seedling response was such that closer examination of biological activity in the soils is justified. Consequently, an expanded study has been proposed by scientists at the U.S. Forest Service Hydrology Laboratory in Wenatchee.

S. H.

WILDLING INTERPLANTING

Art Bernstein and Larry Brown, Josephine County Department of Forestry, established a study on the Hole-in Ground drainage adjacent to Wolf Creek, to compare the growth and survival of 2-1 Douglas-fir seedlings and wildling transplants lifted from sites near the study area.

Prior to planting, an overstory of Pacific madrone was reduced 50 percent in the summer of 1976 by injecting Tordon 101. The remaining trees were again injected with 2,4-D amine in the summer of 1978. Trees injected in both years were left standing to provide partial shade.

A survey of the site in December, 1978, revealed good survival for both the nursery stock and the wild seedling transplants, although survival was somewhat higher for the nursery stock. Nursery stock was browsed more heavily than the wildling transplants. The 1979 growing season should produce some interesting results as the seedlings react to release.

S. H.

THE EFFECTS ON FOREST PRODUCTIVITY OF SOIL COMPACTION CAUSED BY LOGGING

Hank Froehlick, OSU Forest Engineering Department, has recently completed a study on the long term effects of soil compaction on site productivity in the West Fork of Evans Creek. The study was conducted in a 17-year-old plantation of ponderosa pine. Soils were coarse-textured, loamy sands and sands of granitic origin. The height and volume of 30 trees growing in undisturbed soil and skid trails classified as either heavily, moderately, or lightly used, were compared with the soil densities at the base of each tree.

Soil densities of heavily compacted skid trails in the plantation were less than those in new skid trails in a nearby cutting unit; however, soil densities of moderately and heavily used skid trails within the plantation were 30 to 57 percent higher at the 0-6" depth and 22 to 38 percent higher at the 6-12" depth than that of undisturbed soil. Thus, soils in the skid trails had not fully recovered after 17 years.

When compared with trees growing in undisturbed soil and lightly used skid trails, the height of trees in heavily used skid trails decreased 29 percent and their volume was reduced to one-third that of trees on the least disturbed soils. The general relationship between growth reduction and soil density indicated that for each one percent soil density increase, height growth decreases by 0.67 percent.

The area within a harvest unit in different classes of skid trails determines the magnitude of the overall growth reduction. That is, the more area in skid trails and the more severe their use classification, the greater is the loss of site productivity. Using the present site as an example, if the unit had 12, 10, and 3 percent of its area in heavily, moderately, and slightly used skid trails, respectively, a 14.8 percent reduction in volume at 17 years of age could be expected. The average height of trees within the unit would be reduced by 6 percent.

D. M.

MYCORRHIZAL DEFICIENCY IN SOILS OF HARD-TO-REGENERATE SITES IN SOUTHWESTERN OREGON AND NORTHERN CALIFORNIA: AN EXPLORATORY STUDY

Jennifer L. Parke, OSU Department of Botany and Plant Pathology, and James M. Trappe, Pacific Northwest Forest and Range Experiment Station, are exploring the possibility that hard-to-regenerate sites in southwestern Oregon and northern California may represent soils deficient in mycorrhizal fungi beneficial to conifer seedling survival and growth.

The researchers extracted soil samples from 36 clearcuts representative of hard-to-regenerate sites and from adjacent stands or areas of advanced regeneration. Samples were processed in the laboratory and then seeded with Douglas-fir, ponderosa pine and red fescue. After approximately 14 weeks the seedlings were examined for mycorrhizal colonization. Preliminary results indicate that all soils collected contained propagules of mycorrhizal fungi.

It was found that on some sites the soils support mycorrhizal associations with ponderosa pine and not with Douglas-fir. However, it is probable that if the Douglas-fir seedlings can survive long enough, they will eventually form mycorrhizal associations. A central problem is ensuring that the seedlings survive for a period of time sufficient to allow colonization.

Future studies will determine the benefits of inoculating seedlings with beneficial fungi such as Pisolithus tinctorius prior to outplanting. Results from this study and others will be published soon.

S. H.

PREDICTING TREE VIGOR

Oregon State University research conducted as part of the International Biological Program and the Coniferous Forest Biome is paying off by providing basic information with silvicultural implications. Over the last few years, many individuals have worked to develop equations for predicting stem, leaf, and total plant biomass, and leaf areas for numerous species common to Pacific Northwest forests.

R. H. Waring--assisted by foresters attending a silvicultural institute at OSU last fall, started using these equations to estimate biomass, leaf area, and productivity for several sites as a first step in making silvicultural prescriptions.

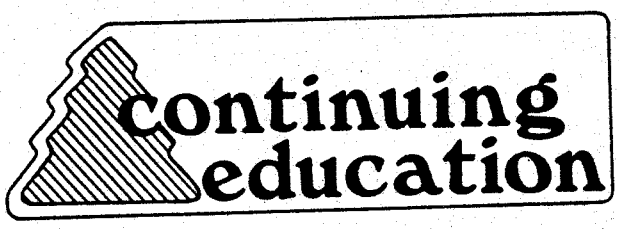
The results indicate that productivity capacity, as measured by maximum accumulated biomass, increases in proportion to the amount of foliage that can be maintained in a particular environment. However, the annual production of harvestable stemwood peaks at leaf areas well below the maximum supportable by the environment and then decreases as leaf areas increase. This adds additional support for precommercial thinning of stands to increase merchantable wood production.

The study also provides an innovative approach to determining the vigor of potential crop trees. Vigor may be used to characterize the competition these trees encounter from competing hardwood species and noncrop trees. Thus, we may have a method for ranking precommercial and

hardwood control operations according to the level of competition.

The procedure looks promising and may prove to be of great practical value to foresters in the near future. FIR specialists will follow this research closely and report the results as they become available.

D. M.



OUR NATIONAL LANDSCAPE: A CONFERENCE ON APPLIED TECHNIQUES FOR ANALYSIS AND MANAGEMENT OF THE VISUAL RESOURCE

April 23-25. Hyatt Lake Tahoe Hotel. Incline Village, Nevada. CONTACT: Dr. Gary H. Elsner, Pacific Southwest Forest and Range Experiment Station, P.O. Box 245, Berkeley, CA 94701.

TREES: TIMBER RESOURCE ECONOMIC ESTIMATION SYSTEM WORKSHOP

April 27, Josephine County Extension Service 4-H Auditorium, Grants Pass, OR. TREES is a forest management and harvest scheduling simulator that allows the user to examine the economic consequences of various management alternatives. CONTACT: Steve Hobbs, Forestry Intensified Research Program, 1301 Maple Grove Drive, Medford, OR 97501. Phone (503) 776-7371.

FORESTS: A FRESH PROSPECTIVE FROM ECOSYSTEM ANALYSIS. 40TH ANNUAL BIOLOGY COLLOQUIUM

April 27-28. Home Economics Building Auditorium, Oregon State University. CONTACT: Dick Waring, Department of Forest Science, Forest Research Laboratory, Oregon State University, Corvallis, OR 97331. Phone (503) 753-9166.

SEVENTH BIENNIAL WORKSHOP ON COLOR AERIAL PHOTOGRAPHY IN THE PLANT SCIENCES AND RELATED FIELDS

May 15-17. University of California, Davis. CONTACT: William M. Ciesla, Forest Insect and Disease Management, Methods Application Group, U.S. Forest Service, 2819 Chiles Road, Davis, CA 95616.

PRACTICAL TREE IMPROVEMENT

June 12-14. Oregon State University. CONTACT: Conference Assistant, School of Forestry, Oregon State University, Corvallis, OR 97331. Phone (503) 754-3709.

AERIAL PHOTO/REMOTE SENSING

June 18-22. Peavy Hall, Oregon State University. CONTACT: Conference Assistant, School of Forestry, Oregon State University, Corvallis, OR 97331. Phone (503) 754-3709.

FOREST HABITAT TYPE WORKSHOP

July 11-13. H. J. Andrews Experimental Reserve. CONTACT: Conference Assistant, School of Forestry, Oregon State University, Corvallis, OR 97331. Phone (503) 754-3709.

STRUCTURE AND FUNCTION OF CONIFEROUS FOREST AND STREAM ECOSYSTEMS WORKSHOP

July 16-20. H. J. Andrews Experimental Reserve. CONTACT: Conference Assistant, School of Forestry, Oregon State University, Corvallis, OR 97331. Phone (503) 754-3709.

SAMPLING ON SUCCESSIVE OCCASIONS WORKSHOP

July 17-20. Rockwell Hall, Colorado State University. CONTACT: Office of Conferences and Institutes, Residential Conference Center, Colorado State University, Fort Collins, CO 80523.

1979 WORKSHOP ON FOREST RESOURCE INVENTORIES

July 22-27. Rockwell Hall, Colorado State University. CONTACT: Office of Conferences and Institutes, Rockwell Hall, Colorado State University, Fort Collins, CO 80523.

NORTHWEST FOREST SOILS COUNCIL FIELD TRIP

July 25-26. Pacific Northwest Forest and Range Experiment Station, Hydrology Laboratory. Wenatchee, WA. Field trip topics will include nutrient cycling, monitoring of soil mass movement, and the Entiat Experimental Forest 10 years after fire: timber salvage, water quality and reforestation. CONTACT: Dave McNabb, FIR, 1301 Maple Grove Drive, Medford, OR 97501. Phone (503) 776-7371.

Dave will act as car pool coordinator for those interested in going from southwest Oregon.

# of interest

FIR PROGRAM ON SOIL COMPACTION

FIR scientists are initiating soil compaction research and extension programs. A meeting with soil scientists and hydrologists pointed out the need for additional information about: 1) losses of site productivity resulting from soil compaction and soil displacement, 2) benefits of ripping to reduce soil density, and 3) identification of southwest Oregon soils most prone to compaction. An upcoming meeting with foresters is anticipated to expand the subject to include the implications soil compaction has on silvicultural and harvesting systems.

A soil compaction workshop is tentatively scheduled for September, 1979. Speakers from outside as well as within the FIR area will be invited to present the most up-to-date reports on soil compaction and the effect it has on tree growth. The workshop will be aimed at industrial and supervisory foresters and forest specialists.

Topics to be included are: defining the soil compaction process, effects of soil compaction on soil physical properties, effects of soil compaction on root elongation and tree root systems, reports on local and regional losses of site productivity following soil compaction, harvest scheduling and systems to minimize soil compaction, reclaiming compacted soils, and the hazards of repeated entries onto the land.

D. M.

"REGENERATING OREGON'S FORESTS"

If you are concerned with reforestation in southwestern Oregon, "Regenerating Oregon's Forests" is a handbook you should have. Compiled and edited by Brian D. Cleary, Robert D. Greaves and Richard K. Hermann, and published by the Oregon State University Extension Service, this 1978 publication provides the professional forester with an excellent source of pertinent reforestation information. It includes a concise summary of current technical information with a complete list of references at the end of each chapter. Every aspect of reforestation technology is covered in some detail.

Copies of "Regenerating Oregon's Forests" can be obtained for $9.50 each (plus $0.50 for postage and handling) from the Extension Business Office, Extension Hall 118, Oregon State University, Corvallis, OR 97331.

S. H.

CUTBANK EROSION

Cutbank erosion from roads is producing large amounts of sediment this winter. Water samples collected from a recent timber sale on the Illinois Valley Ranger District during the mid-January storm showed runoff from the cutbanks were 25 to 90 times more turbid than from other sites. The cutbank water samples were compared to samples from the East Fork of the Illinois River and streams and gullies in recently burned clearcut units (Don McLennan and Mike Amaranthus, Siskiyou National Forest).

Cutbank erosion may be higher than usual this winter because of the cold weather and absence of snowpack. Frost heaving of cutbanks has been severe. Some seeding mulches are ravelling into road ditches after only two weeks of cold weather.

Frost heaving is also loosening soil particles in cutbanks so they may later ravel down the bank when they thaw. During clear days, this process may occur in some areas on a daily cycle. In other areas, ice in the soil may melt during warming or rainy periods, leaving the super-saturated soil to literally flow down the cutbank.

Frost heaving of cutbanks appears to be an important factor contributing to the failure of cutbank vegetation. Ravelling of soil from frost action buries plants from above, and, if plants are sparse, undercuts them from below. The plants topple over, or frost heaving severs the roots.

Forest roads are considered to be the major source of sediment resulting from forest management. Frost heaving in cutbanks is making this problem more complicated and is an important factor as to why we have not been successful in maintaining vegetation on cutbanks.

The FIR staff would appreciate any information you have on this subject or thoughts as to how to solve the problem.

D. M.

REFORESTATION PROBLEM ANALYSIS WORKSHOPS

In January FIR conducted two reforestation problem analysis workshops to get recommendations from southwest Oregon foresters on priority educational and adaptive research needs in reforestation. Held in Roseburg and Medford, the sessions were attended by foresters representing

the Bureau of Land Management, timber industries, Oregon State University Extension Service, and the U.S. Forest Service.

Participants at the Roseburg workshop indicated that management of competing vegetation and site preparation were of primary concern. These problem areas were reemphasized when the group identified herbicide prescription and site preparation techniques in southwest Oregon as subject areas of major interest for future workshops or short courses.

Foresters at the Medford workshop want FIR researchers to investigate reforestation problems associated with sites occupying steep slopes with shallow soils. Specifically, they felt that establishing guidelines for matching specific stock types, site preparation procedures and planting techniques to different site conditions should be the number one priority. Participants concluded that important subject areas for FIR educational programs should be 1) regeneration systems, and 2) site preparation in southwest Oregon.

Current plans and objectives for future research and educational programs have been formulated incorporating many of the ideas and suggestions that surfaced during these discussions. FIR staff members will continue to rely heavily on guidance provided by area foresters and other specialists.

S. H.

MORE ON CUTBANK EROSION

At Washington State University's "Soil Erosion and Sedimentation Control Short Course," Robert L. Berger, landscape architect, Maintenance Division, Department of Highways, Olympia, WA, made a presentation titled "Fertilization - value and advantage in soil erosion control." He recommends refertilizing roadside seedlings at least twice after establishment. His office has found soil nutrients more limiting to seedling survival than water availability.

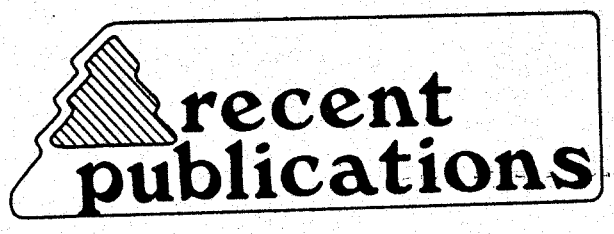
Berger and his associates are particularly concerned about maintaining grass cover in mountainous terrain because of the hazard posed by trees growing along the right-of-way. Heavy grass cover prevents the trees from becoming established and reduces their long-term maintenance costs. Since a heavy grass cover is beneficial to reducing sediment production from cutbanks, fertilization of forest roadsides may be needed in this area.

Berger also reported that soil pH of mountain and western Washington soils is low and is not conducive to maintaining grass as the dominant vegetation. Therefore, highway crews are adding liming materials to the soils to raise the soil pH, and fertilizing where soil tests indicate it is necessary.

The highway department is using hydroseeders, tailgate spinners (sand spreaders), helicopters and a Fertiblast gun to spread materials. The latter uses compressed air to propel the fertilizer. The fertilizer has to be homogeneous granules to prevent segregation. Blends will not work and prilled particles are too brittle or often hollow.

Limestone products pose special problems in spreading because, for agricultural use, their quality is partially based on fineness. Fine particles will neutralize soil acidity faster than courser materials; however, fine particles are difficult to spread and pose dust problems. Therefore, courser particles with few fines are best for spreading across slopes.

D. M.



For copies of the publications listed below, mail your requests to the appropriate address as indicated by the number following each summary. Requests should be sent to:

1. Forest Research Laboratory
   Oregon State University
   Corvallis, OR 97331

2. Publications
   Pacific Northwest Forest and
   Range Experiment Station
   P.O. Box 3141
   Portland, OR 97208

3. Publications
   Pacific Southwest Forest and
   Range Experiment Station
   P.O. Box 245
   Berkeley, CA 94701

4. FERIC
   201-2112 W. Broadway
   Vancouver, B.C. V6K 2C8
   CANADA

5. Agricultural Experiment Station
   New Mexico State University
   Las Cruces, NM 88001

SPACING OF ROADS AND LANDINGS TO MINIMIZE TIMBER HARVEST COSTS, by P. A. Peters. 1978. Forest Science 24:209-217. A direct method to determine optimum road and landing spacing that will minimize timber harvest costs is presented. The method is easier than the "trial and error" method developed by Matthews.

1

THE DEAD INDIAN PLATEAU: A HISTORICAL SUMMARY OF FORESTRY OBSERVATIONS AND RESEARCH IN A SEVERE SOUTHWESTERN OREGON ENVIRONMENT, by D. Minore. 1978. USDA Forest Serv. Gen. Tech. Rep. PNW-72, Pacific Northwest Forest and Range Experiment Station. 23 p. A broad overview of the history of the Dead Indian Plateau including discussions on the geology, soils, climate, and vegetation of the area is presented. Observations, field trials and research studies are summarized as well as suggestions for future research. The major obstacles in the path of successful reforestation such as frost damage, gopher problems and moisture stress due to vegetative competition, are also discussed.

2

VEGETATIVE INDICATORS, SOILS, OVERSTORY CANOPY, AND NATURAL REGENERATION AFTER PARTIAL CUTTING ON THE DEAD INDIAN PLATEAU OF SOUTHWESTERN OREGON, by D. Minore and R. E. Carkin. 1978. USDA Forest Serv. Res. Note PNW-316, Pacific Northwest Forest and Range Experiment Station. 9 p. In 1976, 55 stands on the Dead Indian Plateau that had been partially cut prior to 1968, were examined for post-harvest natural regeneration stocking. Vegetation, soil characteristics and overstory canopy density were measured to evaluate their association with regeneration stocking levels. It was found that vegetation, soil nitrogen and overstory canopy density were significantly correlated with post-harvest natural regeneration. A multiple regression equation, using the stocking level as the dependent variable and a vegetative index and canopy density (deviation from optimal 60 percent canopy) as the independent variables, accounted for 61 percent of the observed stocking variation. Based on canopy density and vegetative indicators, specific management recommendations are made as to which partially cut stands can be regenerated naturally and which require underplanting.

2

SOIL COMPACTION FROM LOW GROUND-PRESSURE, TORSION - SUSPENSION LOGGING VEHICLES ON THREE FOREST SOILS, by H. A. Froehlich. 1978. Research Paper 36. Forest Research Laboraoty, Oregon State University. 13 p. The paper presents the results of a study to determine the effect the FMC Series Skidder has on soil densities and surface soil disturbance. The largest soil density increase occurs between the depths of 2 to 4 inches and is achieved during the first few trips. Litter and slash layers tend to remain in place during the first 20 trips on level ground. On the Mt. Hood and Umpqua National Forests, skidding on slopes under 30% disturbs 12 to 15% of the surface area but only 2 to 3% is heavily disturbed.

1

DEFECT ESTIMATION FOR WHITE FIR IN THE ROGUE RIVER NATIONAL FOREST, by P. E. Aho and L. F. Roth. 1978. USDA Forest Serv. Res. Pap. PNW-240. Pacific Northwest Forest and Range Experiment Station. 18 p. A total of 501 trees from 53 sites throughout the Rogue River National Forest were felled and bucked to determine defective cubic and board foot volumes. Two methods were developed for estimating the extent of defect in standing trees: 1) defect percentages of gross merchantable Scribner and International board-foot volumes and cubic-foot volumes were tabulated by d.b.h. and age; constant defect percentage must be added for various indicators; and 2) average length deductions below and above indicators plus flat factors for hidden defect were estimated. The first method is most accurate and is readily adapted to computer programs compiling inventory data; however, the second method may be effectively used by experienced cruisers. An additional 146 white fir were sampled to test the defect prediction equations (1) and found to estimate defect in cubic and board-feet volumes within 1% of the actual defect for the entire sample.

2

ANNUAL VARIATION IN EFFECT OF 2,4-D AND 2,4,5-T ON PONDEROSA PINE, by H. J. Gratkowski. 1978. Forest Science 24:281-287. This paper reports the effect season of application has on the amount of herbicide damage incurred by ponderosa pine during release. The study was conducted on the Rogue River National Forest northeast of Medford. Trees are susceptible to damage months before beginning height growth in the spring and are most susceptible in May and June. Information as to the time for releasing ponderosa pine from green-leaf manzanita is presented.

2

PRODUCTION AND PERFORMANCE STUDIES OF FMC 200 SERIES SKIDDERS, by L. H. Powell. 1978. Tech. Rep. TR-29. Forest Engineering Research Institue of Canada. The report compares machine performance under various terrain and operation conditions. Performance analysis includes time, production rates, and costs of operation. Data is presented for repair downtime for both pre- and post-modification of machines. Repair time for road wheels and torsion suspension decreases from 26% to 6% of the total repair time following modification.

4

GERMINANT REFORESTATION: A PROMISING NEW TECHNIQUE, by R. L. DeVelice and B. A. Buchanan. 1978. USDA Tree Planters' Notes. 29(2):3-6. Ponderosa pine seeds were collected and germinated in moist vermiculite under sheets of paper at 20°C. Germinants were outplanted nine days after germination. Thirty-two seedspots were prepared within each study plot. Within each plot sixteen seedspots were covered with a wire mesh cone shaped cap and eight of the covered seedspots mulched with debris collected from the site. Eight uncapped seedspots were also mulched within each plot. Caps were found to significantly enhance germinant survival while mulching did not. It was recommended that at least two germinants per capped seedspot be planted. The use of germinants in lieu of nursery stock for regeneration on shallow soils holds promise and warrants further investigation.

5

SURVIVAL AND GROWTH OF PLANTED CONIFERS ON THE DEAD INDIAN PLATEAU EAST OF ASHLAND, OREGON, by D. M. Williamson and D. Minore. 1978. USDA Forest Serv. Res. Pap. PNW-242, Pacific Northwest Forest and Range Experiment Station. 15 p. Bare-root and containerized Douglas-fir, ponderosa pine and white fir stock were planted in the open and underplanted in partially cut stands on four severe sites on the Dead Indian Plateau. Other treatments included gopher cages, irrigation and fencing to exclude cattle. Treatment comparisons were made in terms of seedling growth and survival. It was concluded that plantations established under a protective canopy have a much higher chance of success than those planted in the open. The publication contains excellent location maps for each of the four research areas and they can be easily found.

2

CONTAINER AND ROOT TREATMENTS AFFECT GROWTH AND ROOT FORM OF PLANTED PONDEROSA PINE, by P. W. Owston and K. W. Seidel. 1978. Can. Jour. of For. Res. 8:232-236. Bare-root 2-0 ponderosa pine seedlings were grown in 1.9 liter milk cartons and outplanted on a site southwest of Bend, OR. Containerized stock were subjected to one of three treatments: 1) bottom of the carton removed; 2) entire container removed; 3) whole container removed and spiralled roots cut from the bottom of the root ball. Field performance and root form were observed over a five-year period. Although survival was good for all treatments, height growth was greatest on containerized seedlings at the end of five years. On the average, containerized seedlings that had the whole container removed and the spiralled roots cut, out performed the other treatments with an averaged attained height of 98.3 cm at the end of the 1973-1974 growing season. Remaining trees will be reexamined in 20 years.

2

SUGAR PINE OUTPERFORMS PONDEROSA PINE ON A HOT, DRY SITE, by W. W. Oliver. 1978. USDA Tree Planters' Notes 29(4):14-17. In 1936 two 0.1 acre plots were planted with two-year-old sugar pine and ponderosa pine in the Kennett smelter-fume area of Shasta County, CA. The planting site occupies a steep south facing slope at an elevation of 1,300 feet on a severely eroded gravelly, sandy loam less than 2 feet in depth in many places. Site index for ponderosa pine was estimated at between 40 and 50 feet at 50 years. Forty years after planting, both plots were reexamined in the fall of 1978. Basal area, cubic foot volume per acre and DBH for sugar pine were 20 percent greater than that of ponderosa pine. Live crown ratios and average heights were found to be about equal. It is suggested that sugar pine may be an alternative species to ponderosa pine on low elevation, droughty sites under which conditions white pine blister rust is rarely a problem. General recommendations must await further research.

3

LONG-TERM PATTERNS OF SEDIMENT PRODUCTION FOLLOWING ROAD CONSTRUCTION AND LOGGING IN THE OREGON COAST RANGE, by R. L. Beschta. 1978. Water Resource Research 8(14):1011-1016. This is an update on the Alsea watershed study eight years after harvesting. Mass soil erosion from roads was the principal erosion process in the 25% patch-cut watershed; however, surface erosion was the primary cause of increased sediment yields in the slash burned clearcut. Both the timing and the magnitude of sediment production were altered by forest operations. The paper concludes that correlations between sediment concentration and discharge may be affected as much by the time of sampling and the sequence of flow events as by the conditions of the watershed and channel system.

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