

REPORT OF THE SUBCOMMITTEE ON RESEARCH

EVALUATION, COORDINATION, AND PLANNING

by Paul O. Rudolf 1/

The Committee on Forest Tree Improvement of the Society of American Foresters is preparing an annotated directory to the United States workers in forest genetics and related fields. It will compare with a similar directory to Canadian and foreign workers that was published in the Journal of Forestry for August 1960 (pp. 602-618).

Our Subcommittee assembled information for the workers in the Lake States. It will be consolidated with similar information from

other parts of the country to form the national directory. Because there may be some advantage in having a separate regional directory we are presenting the alphabetical list of research workers in forest genetics and related fields in the Lake States and the Dakotas (Exhibit I), and a list of specialties, with the workers involved in each (Exhibit II). The Subcommittee will welcome information concerning any corrections or additions that should be made to this list.

1/ Chairman of the RECAP Subcommittee and Research Forester, Lake States Forest Experiment Station, St. Paul 1, Minn.

Exhibit I.--Alphabetical list of research workers in forest genetics and related fields in the Lake States and the Dakotas

| Name and title | Address | Specialties ^{1/} |
|--|--|--|
| 1. Ahlgren, C. E. Resident Director | Quetico-Superior Wilderness Research Center, Ely, Minn. | IE-- <u>Picea</u> , <u>Pinus</u> , <u>Pseudotsuga</u> , <u>Larix</u> , <u>Tsuga</u> ; VG; VP-- <u>Pinus</u> , <u>Abies</u> ; DR-- <u>Pinus</u> |
| 2. Alden, Howard, Research Assistant | School of Natural Resources, Univ. of Mich., Ann Arbor, Mich. | VA-- <u>Populus</u> |
| 3. Anderson, G. W., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., St. Paul 1, Minn. | DR-- <u>Pinus</u> |
| 4. Anderson, N. A. Asst. Professor | Dept. of Plant Pathology and Botany, Univ. of Minn., St. Paul 1, Minn. | DR-- <u>Pinus</u> |
| 5. Anderson, R. L. Plant Pathologist | U. S. Forest Serv., Lake States Forest Expt. Sta., St. Paul 1, Minn. | DR-- <u>Pinus</u> |
| 6. Andresen, J. W., Asst. Professor | Dept. of Forestry, Mich. State Univ., East Lansing, Mich. | PR, TA, VA-- <u>Pinus</u> |
| 7. Arbogast, Carl, Jr., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., Marquette, Mich. | SC--General, VA-- <u>Picea</u> , PR-- <u>Pinus</u> |

^{1/} See Exhibit II for explanation of subject-matter symbols.

| Name and title | Address | Specialties ^{1/} |
|--|--|---|
| 8. Arend, J. L., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., East Lans- ing, Mich. | SC--General, PR-- <u>Pinus</u> , <u>Larix</u> |
| 9. Benson, Miles K., Research Assistant | Biology Group, Forest Genetics, The Institute of Paper Chemis- try, Appleton, Wis. | NT, SE, ST, VC, VG, VP-- <u>Populus</u> , PR-- <u>Larix</u> |
| 10. Bean, J. L., Entomologist | U. S. Forest Serv., Lake States Forest Expt. Sta., St. Paul 1, Minn. | CP-- <u>Picea</u> |
| 11. Berbee, J. G., Asst. Professor | Dept. of Plant Pathology, Univ. of Wis., Madison 6, Wis. | ST, CT, CV-- <u>Populus</u> |
| 12. Berklund, B. L., Forester | Nekoosa-Edwards Paper Co., Port Edwards, Wis. | PR-- <u>Picea</u> , <u>Pinus</u> |
| 13. Blake, G. M., Research Assistant | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | EX-- <u>Pinus</u> , FR-- <u>Populus</u> , VP-- <u>Tilia</u> |
| 14. Buckman, R. E., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., Grand Rapids, Minn. | PR-- <u>Pinus</u> , SC--General |
| 15. Clausen, K. E., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., Rhinelander, Wis. | HN-- <u>Betula</u> |
| 16. Collins, P. E., Assoc. Professor | South Dakota State College, Brookings, S. Dak. | HY, VP-- <u>Ulmus</u> , PR-- <u>Fraxinus</u> , IE--General |
| 17. Cromell, W. H., Instructor | North Central School of Agr., Univ. of Minn., Grand Rapids, Minn. | VP-- <u>Picea</u> |
| 18. Duncan, D. R., Professor | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | CT-- <u>Populus</u> , PR-- <u>Picea</u> |
| 19. Einspahr, D. W., Research Associate | Biology Group, Forest Genetics, The Institute of Paper Chemis- try, Appleton, Wis. | BW, GG, HE, PQ, SE, ST; WQ-- <u>Pinus</u> , <u>Populus</u> ; PR-- <u>Larix</u> , <u>Popu-</u> <u>lus</u> ; BH, BM, CP, CS, CT, CV, EX, FE, FL, FO, GR, HG, HN, HP, HS, IE, IN, MU, NT, PH, PL, PS, RA, SC, SF, TE, VC, VG, VP-- <u>Populus</u> |
| 20. French, D. W., Assoc. Professor | Dept. of Plant Pathology and Botany, Univ. of Minn., St. Paul 1, Minn. | PR-- <u>Pinus</u> , DR-- <u>Picea</u> , <u>Pinus</u> , <u>Populus</u> , <u>Ulmus</u> |

^{1/} See Exhibit II for explanation of subject-matter symbols.

| | Name and title | Address | Specialties ^{1/} |
|-----|--|---|---|
| 21. | Garrett, Peter, Research Assistant | School of Natural Resources, Univ. of Mich., Ann Arbor, Mich. | VA-- <u>Populus</u> |
| 22. | Godman, R. M., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., Cadillac, Mich. | FE, SA, SO-- <u>Pinus</u> |
| 23. | Goddard, D. W., Nurseryman-Forester | Rhineland Paper Co., Rhineland, Wis. | NT, SA, SO-- <u>Picea</u> , <u>Pinus</u> |
| 24. | Hiller, Charlotte, Technologist | U. S. Forest Serv., Forest Pro- ducts Laboratory, Madison 5, Wis. | WQ-- <u>Fraxinus</u> |
| 25. | Hill, R. B., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., Rhineland, Wis. | HR, PR-- <u>Pinus</u> |
| 26. | Hitt, R. G., Asst. Professor | Dept. of Genetics, Univ. of Wis., Madison 6, Wis. | FL-- <u>Pinus</u> , ST--General, IN, FR, VP, PO, PR, SI, SA-- <u>Pinus</u> , SO-- General |
| 27. | Hoag, D. G., Asst. Professor | Dept. of Horticulture, North Dakota Agricultural College, Fargo, N. Dak. | VA, VG-- <u>Juniperus</u> |
| 28. | Hodson, A. C., Professor | Dept. of Entomology and Eco- nomic Zoology, Univ. of Minn., St. Paul 1, Minn. | IR, PR-- <u>Pinus</u> |
| 29. | Johnson, A. G., Instructor | Horticulture Dept., Univ. of Minn., St. Paul 1, Minn. | HG-- <u>Populus</u> , IE--General |
| 30. | Jensen, R. A., Asst. Scientist | School of Forestry, Univ. of Minn., Cloquet, Minn. | PR, VA-- <u>Pinus</u> |
| 31. | Kaufert, F. H., Director | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | CT-- <u>Populus</u> |
| 32. | King, J. P., Teaching Assistant | Dept. of Forestry, Mich. State Univ., East Lansing, Mich. | VA-- <u>Pinus</u> |
| 33. | Kozlowski, T. T., Professor | Dept. of Forestry and Wildlife Mgt., Univ. of Wis., Madison 6, Wis. | HA, PS, TR-- <u>Pinus</u> |
| 34. | Klein, Jerome, Research Assistant | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | SI, HY-- <u>Populus</u> , <u>Pinus</u> |

^{1/} See Exhibit II for explanation of subject-matter symbols.

| Name and title | Address | Specialties ^{1/} |
|--|--|---|
| 35. Kuntz, J. E., Assoc. Professor | Dept. of Plant Pathology, Univ. of Wis., Madison 6, Wis. | DR-- <u>Acer</u> , <u>Quercus</u> |
| 36. Kurmis, Vilis, Research Assistant | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | VA, FR-- <u>Pinus</u> |
| 37. Larson, P. R., Plant Physiologist | U. S. Forest Serv., Lake States Forest Expt. Sta., Rhinelander, Wis. | GR, TR, PS-- <u>Pinus</u> , <u>Picea</u> ; VA-- <u>Picea</u> |
| 38. Lassen, L. E., Technologist | U. S. Forest Serv., Forest Products Laboratory, Madison 5, Wis. | WQ, PQ-- <u>Fraxinus</u> , <u>Populus</u> |
| 39. Latimer, M. J., Forester | Blandin Paper Co., Grand Rapids, Minn. | SA-- <u>Picea</u> , ST-- <u>Picea</u> , <u>Populus</u> |
| 39a. McMahan, R. J. Research Assistant | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | CY, MU-- <u>Pinus</u> |
| 40. Mathes, Martin, Research Aide | Biology Group, Forest Genetics, The Institute of Paper Chemistry, Appleton, Wis. | CY, IN, PS, VP-- <u>Populus</u> |
| 41. Macon, J. W., Forester | Consolidated Water Power and Paper Co., Rhinelander, Wis. | ST-- <u>Picea</u> |
| 41a. Mohn, C. A. Research Assistant | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | PS, SC-- <u>Tilia</u> |
| 42. Nagel, C. M., Professor | South Dakota State College, Brookings, S. Dak. | DR-- <u>Populus</u> |
| 43. Nienstaedt, H., Geneticist | U. S. Forest Serv., Lake States Forest Expt. Sta., Rhinelander, Wis. | IE--General; CT-- <u>Picea</u> , <u>Acer</u> ; GG--General; GI, HA, HG, HN, HS, HY, PC, PH, PR, SE, SS, ST, TE, TR, VA, VG-- <u>Picea</u> , <u>Pinus</u> |
| 44. Patton, R. F., Assoc. Professor | Dept. of Plant Pathology, Univ. of Wis., Madison 6, Wis. | DR-- <u>Pinus</u> |
| 45. Pauley, S. S., Professor | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | IE--General; PR, VA-- <u>Larix</u> , <u>Picea</u> , <u>Pinus</u> ; <u>Populus</u> ; HY, TR-- <u>Populus</u> |
| 46. Pillow, M. Y., Supervisory Tech. | U. S. Forest Serv., Forest Products Laboratory, Madison 5, Wis. | PQ, WQ-- <u>Pinus</u> , <u>Fraxinus</u> , <u>Populus</u> |
| 47. Prielipp, D. O., Forest Pathologist | Kimberly-Clark of Michigan, Inc., Iron Mountain, Mich. | CT-- <u>Populus</u> , SO-- <u>Picea</u> |

^{1/} See Exhibit II for explanation of subject-matter symbols.

| Name and title | Address | Specialties ^{1/} |
|--|---|--|
| 48. Pronin, D., Technologist | U. S. Forest Serv., Forest Products Laboratory, Madison 5, Wis. | PQ, WQ-- <u>Populus</u> |
| 49. Riker, A. J., Professor | Dept. of Plant Pathology, Univ. of Wis., Madison 6, Wis. | DR, ST-- <u>Juniperus</u> , <u>Pinus Quercus</u> |
| 50. Ruby, J. L., Research Assistant | Dept. of Forestry, Mich. State Univ., East Lansing, Mich. | HE-- <u>Pinus</u> |
| 51. Rudolf, P. O., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., St. Paul 1, Minn. | IE--General; HP-- <u>Pinus</u> ; PR-- <u>Picea</u> , <u>Pinus</u> , <u>Larix</u> ; SA, SC, SL, SS, ST--General |
| 52. Rudolph, T. D., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., Rhinelander, Wis. | PR, VA-- <u>Pinus</u> |
| 53. Schoenike, R. E., Research Assistant | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | RA-- <u>Pinus</u> , VA-- <u>Pinus</u> , <u>Larix</u> |
| 54. Slabaugh, P. E., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., Bottineau, N. Dak. | IE, SC--General, PR-- <u>Picea</u> , <u>Larix</u> , <u>Pinus</u> |
| 55. Smalley, E. B., Asst. Professor | Dept. of Plant Pathology, Univ. of Wis., Madison 6, Wis. | DR-- <u>Ulmus</u> |
| 56. Spurr, S. H., Professor | School of Natural Resources, Univ. of Mich., Ann Arbor, Mich. | PR-- <u>Larix</u> , <u>Pinus</u> ; VA-- <u>Populus</u> |
| 57. Stewart, D. M., Plant Pathologist | U. S. Agricultural Research Serv., Plant Pest Control Branch, St. Paul 1, Minn. | PE-- <u>Picea</u> , <u>Pinus</u> |
| 58. Sucoff, E. I., Asst. Professor | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | FE, FR, PS--General |
| 59. Trygg, P. Manager, Land & Timber Dept. | Diamond Match Div., Diamond National Corp., Cloquet, Minn. | VG, CV-- <u>Populus</u> |
| 60. Wahlgren, H. E., Project Technologist | U. S. Forest Serv., Forest Products Laboratory, Madison 5, Wis. | PQ, WQ-- <u>Pinus</u> , <u>Populus</u> |
| 61. Watt, R. F., Research Forester | U. S. Forest Serv., Lake States Forest Expt. Sta., St. Paul 1, Minn. | NT-- <u>Picea</u> , <u>Pinus</u> ; FE-- <u>Picea</u> |
| 62. Wells, O. O., Research Assistant | Dept. of Forestry, Mich. State Univ., East Lansing, Mich. | TA, VA-- <u>Pinus</u> |

^{1/} See Exhibit II for explanation of subject-matter symbols.

| Name and title | Address | Specialties ^{1/} |
|---|--|---|
| 63. Wilson, L. F., Entomologist | U. S. Forest Serv., Lake States Forest Expt. Sta., East Lansing, Mich. | CP, FE-- <u>Pinus</u> |
| 64. Winton, Lawson, Research Assistant | School of Forestry, Univ. of Minn., St. Paul 1, Minn. | HN, FL, PL-- <u>Picea</u> |
| 65. Wright, J. W., Assoc. Professor | Dept. of Forestry, Mich. State Univ., East Lansing, Mich. | HG-- <u>Acer, Fraxinus, Picea,</u> <u>Pinus</u> ; PR-- <u>Fraxinus, Pinus</u> ; HE, GG--General |
| 66. Zahner, R., Assoc. Professor | School of Natural Resources, Univ. of Mich., Ann Arbor, Mich. | PR-- <u>Pinus, VA--Populus</u> |

^{1/} See Exhibit II for explanation of subject-matter symbols.

Exhibit II.--Explanation of subject-matter symbols and workers
involved in each specialty

| Symbol | Meaning of symbol | Workers involved ^{1/} |
|--------|---|--------------------------------|
| BH | Variation and inheritance of branching habit, including size, angle, number, and persistence of branches. | 19 |
| BM | Breeding, general; and breeding methods. | 19 |
| BW | Variation and inheritance of yield or properties of bark and wood extractives. | 19 |
| CP | Cone or fruit insects and diseases, control of birds and animals in seed production areas or orchards. | 10, 19, 63 |
| CT | Clonal testing, tree shows. | 11, 18, 19, 31, 43, 47. |
| CS | Control of pests in processed seed, or in seed and seedlings in the nursery or field plantings. | 19 |
| CV | Clonal variation, general. | 11, 19, 59 |
| CY | Cytogenetics and cytology, chromosome number, chromosome staining, and chromosomal aspects of crossability. | 39a, 40 |

^{1/} These are numerical references to workers listed in Exhibit I.

| Symbol | Meaning of symbol | Workers involved ^{1/} |
|--------|--|------------------------------------|
| DR | Variation and inheritance of disease resistance, including physiology or mechanisms of resistance and physiologic races of pathogens. | 1, 3, 4, 5, 20, 35, 42, 44, 49, 55 |
| EX | Experimental design, nursery and field sampling of wild or planted test materials. | 13, 19 |
| FE | Forest tree fertilization and nutrition, including mineral deficiencies. | 19, 22, 58, 61, 63 |
| FL | Floral biology, especially in relation to controlled pollination or breeding procedures. | 19, 26, 64 |
| FO | Variation and inheritance of foliage characters, including morphology, color, biochemistry, etc. | 19 |
| FR | Variation and inheritance of fruiting or fruitfulness and seed yield or set, including climatic influences. | 13, 26, 36, 58 |
| GG | General forest genetics, including educational and administrative aspects, libraries, translations, directories, bibliographies, herbaria, arboreta, etc. | 19, 43, 65 |
| GI | Genetical improvement of natural stands. | 43 |
| GR | Variation and inheritance of growth rate or increment, including growth efficiency. | 19, 37 |
| HA | Variation, inheritance, and testing of winter, frost, or cold hardiness. | 33, 43 |
| HE | Statistical genetics, including narrow or broad sense heritability, combining ability, parent-progeny correlations, dominance, epistacy, etc. | 19, 50, 65 |
| HG | Hybridization, interspecific and intergeneric. | 19, 29, 43, 65 |
| HN | Hybridization, natural, including introgression and hybrid swarms. | 15, 19, 43, 64 |
| HP | Hybrid performance, including hybrid interplantings. | 19, 51 |
| HR | Variation and inheritance of drought, heat, and salt resistance. | 25 |
| HS | Hybridization, intraspecific and intraracial. | 19, 43 |
| HY | Hybridization and hybridity, general, including crossability patterns, determination of hybridity, interspecific incompatibility, and heterosis or hybrid vigor. | 16, 34, 43, 45 |

^{1/} These are numerical references to workers listed in Exhibit I.

| Symbol | Meaning of symbol | Workers involved ^{1/} |
|--------|--|--|
| IE | Introduction (acclimatization) and performance of exotics or breeding materials of exotic origin. | 1, 16, 19, 29, 43, 45, 51, 54 |
| IN | Flower induction in reproductively immature trees, photo-periodic, chemical, mechanical, etc. | 19, 26, 40 |
| IR | Variation and inheritance of insect or animal resistance. | 28 |
| MU | Mutation, mutation rates and induced mutation, including chimeras and sports. | 19, 39a |
| NT | Nursery and transplanting, technology. | 9, 19, 23, 61 |
| PC | Controlled pollination technique. | 43 |
| PE | Pollen handling, including collection, extraction, forcing, storage, purity, and germination. | 53, 57 |
| PH | Phenology, general, or in relation to seed set, time of pollination and seed collection, cross- or self-ability, and insect, disease, or frost injury. | 19, 43 |
| PL | Polyploidy, natural and induced. | 19, 64 |
| PO | Pollen and pollen grain studies, general, including pollen morphology, tube growth and metabolism, and paleobotanical aspects. | 26 |
| PQ | Variation and inheritance of pulping qualities, including cell length and strength, fibril angle, density, etc. | 19, 38, 46, 48, 60 |
| PR | Provenience (Provenance) studies. | 6, 7, 8, 9, 12, 14, 16, 18, 19, 20, 25, 26, 28, 30, 43, 45, 51, 52, 54, 56, 65, 66 |
| PS | Basic physiologic studies in growth or growth efficiency, metabolism, water relations, auxin relations, apical dominance, topophysis, etc. | 19, 33, 37, 40, 41a, 58 |
| RA | Distribution or range studies concerning varieties, species, or other taxa. | 19, 53 |
| SA | Seed production areas, in improved natural stands. | 22, 23, 26, 39, 51 |
| SC | Seed collection, extraction, storage, variability and soundness tests, seed crop periodicity and forecasting. | 7, 8, 14, 19, 41a, 51, 54 |

^{1/} These are numerical references to workers listed in Exhibit I.

| Symbol | Meaning of symbol | Workers involved ^{1/} |
|--------|---|---|
| SE | Selection, general, including methods and techniques, selection indices, juvenile-mature tree growth, or other relations affecting efficiency of selection. | 9, 19, 43 |
| SF | Variation and inheritance of bole or stem form, forking, crook, sweep, straightness, etc. | 19 |
| SI | Self-incompatibility and -compatibility, self-infertility and -fertility, selective fertilization, inbreeding depression, albinism, etc. | 26, 34 |
| SL | Seed, stock, tree, and clone registration laws, regulations and certification, including planting zones and plus and elite tree or stand registration. | 51 |
| SO | Seed orchard technology in planted orchards, including spacing, shaping, pollen contamination, etc. | 22, 23, 26, 47 |
| SS | Selection, stands. | 43, 51 |
| ST | Selection, single trees and mass selection. | 9, 11, 19, 26, 39, 41, 43, 49, 51 |
| TA | Taxonomy, including cytotaxonomy, varietal testing and identification, and botanical nomenclature. | 6, 62 |
| TE | Progeny testing, including theoretical considerations, one- and two-parent tests, polycrossing and diallel crossing, etc. | 19, 43 |
| TR | Tropisms, including photoperiodisms, thermoperiodisms, etc., and basic studies. | 33, 37, 43, 45 |
| VA | Variation, general, basic studies in clinal or ecotypic variation, including edaphic, climatic, geographic, etc., variation. | 2, 6, 7, 21, 27, 30, 32, 36, 37, 43, 45, 52, 53, 56, 62, 66 |
| VC | Vegetative propagation by cuttings, layers, leaf bundles, or leaves. | 9, 19 |
| VG | Vegetative propagation, by grafting or budding. | 1, 9, 19, 27, 43, 59 |
| VP | Vegetative propagation, general, including basic studies on origin of roots, stock-scion relations, etc. | 1, 9, 13, 16, 17, 19, 26, 40, 45 |
| WQ | Variation and inheritance of wood qualities, including strength and other properties, wood anatomy. | 19, 24, 38, 46, 48, 60 |

^{1/} These are numerical references to workers listed in Exhibit I.