

IN NEW ZEALAND CONTEMPORARIES

NEW ZEALAND JOURNAL OF SCIENCE AND TECHNOLOGY

EVALUATING CONDITION OF FREE-RANGING RED DEER (CERVUS ELAPHUS) WITH SPECIAL REFERENCE TO NEW ZEALAND: PART I—DESCRIPTION OF TECHNIQUES FOR DETERMINATION OF CONDITION OF RED DEER. By T. Riney. Vol. 36 B. No. 5, 1955.

The response of fat reserves to levels of nutrition was used to indicate intra- and inter-population differences in the condition of deer. The Kidney Index (weight of kidney fat/weight of kidney) was most satisfactory, and showed variations in both sexes due to season and habitat. Other indices considered included depth of fat near base of tail, amount of abdominal fat, fat content, and appearance of bone marrow, girth measurement, body weight, and antler characteristics. The results from these indices were similar to those from Kidney Index, but different in detail. The techniques were tested also on fallow deer (*Dama dama*), feral goats (*Capra* sp.), chamois (*Rupicapra rupicapra*), thar (*Hemitragus jemlaicus*), sambar (*Cervus unicornis*), Javan rusa (*Cervus timoriensis*), mule deer (*Odocoileus hemionus*), and Common Australian phalanger (*Trichosurus vulpecula*).

EVALUATING CONDITION OF FREE-RANGING RED DEER (CERVUS ELAPHUS) WITH SPECIAL REFERENCE TO NEW ZEALAND: PART II—APPLICATION OF CONDITION INDICES TO DEER ECOLOGY AND MANAGEMENT RESEARCH. By T. Riney. Vol. 36 B. No. 5, 1955.

The Kidney Index (see previous abstract) was discussed as a technique for elucidating the ecology of deer populations, and to give the pattern of seasonal changes in deer populations in a South Island area. Comparisons of differences in levels of inter- and intra-population responses in different environments is suggested as a tool which may prove useful in understanding the mechanisms by which wild ruminant populations are adapted or are adapting to these environments. This, in combination with sex and age ratios, provides data for estimating rate of recovery in severely reduced populations, and can be useful in deciding the priority of control operations between two different environments. Through fat reserve indices it was shown that deer tended to remain in a given area. This emphasizes that control practices should be more intensive rather than of a generalized nature.

A NOTE ON SOME THEORY RELATING TO THE DIFFUSION OF CHEMICALS IN GREEN TIMBER. By A. McNabb and W. B. Taylor, Vol. 36 B. No. 5, 1955.

When an aqueous chemical solution is applied to the surface of green timber the chemical diffuses into the wood. Some relationships between the concentration of the solution at a given depth from the surface and the diffusion time have been published for configurations where the diffusion occurs in directions perpendicular to plane faces.

A correction is made to a wrongly cited result in one such case and the corresponding theory for radial diffusion into timber of circular cross section is given.

PLIOCENE AND PLEISTOCENE PLANT FOSSILS OF NEW ZEALAND AND THEIR CLIMATIC INTERPRETATION. By R. A. Couper and D. R. McQueen. Vol. 35 A. No. 5, 1955.

Plant fossils from the Taranaki, Wanganui, and Hawera Series provide evidence supporting the suggestions of Fleming that the Pliocene-Pleistocene boundary in New Zealand is at the base of the Nukumaruan Stage. Accordingly, Nukumaruan, Castlecliffian, and Hawera Series floras are classed as Pleistocene.

Upper Miocene (and most Pliocene floras) from widely different latitudes are similar, suggesting a relatively uniform climate. Several extinct species, notably of *Nothofagus*, ranging from lower Miocene and older beds, last appear in Pliocene floras.

Some Pleistocene floras indicate climates cooler than the present. Others show no evidence of cool climate. In contrast to Miocene floras, Pleistocene and some Pliocene floras show geographical differentiation of vegetation.

Evidence of climatic changes from fossil floras is shown diagrammatically, and cool periods are tentatively correlated with West Coast glaciations.

DIFFUSION IMPREGNATION OF TIMBER BY THE MOMENTARY IMMERSION PROCESS. By D. R. Carr. Vol 36 B. No. 4, 1955. (Reprinted as Forest Research Institute Technical Paper No. 6.)

Tests carried out on the diffusion impregnation of green tawa (*Beilschmiedia tawa*) by the momentary immersion process, using a 30% w/v boron solution expressed as equivalent boric acid, followed by block stacking, are described. The tests were designed to examine the effects of surface condition of boards on solution uptake and subsequent distribution of boron in the wood. The effects of partial air-drying of boards and of surface-wetting were also examined and the stability of the treating solution over three weeks' commercial operations recorded.

The highest core retentions were obtained in rough-sawn (circular sawmill) boards treated immediately after sawing.

The core retentions obtained in freshly sawn boards that were dressed immediately and then diffusion impregnated conformed substantially with the requirements generally specified in New Zealand for such treatments. Equivalent core retentions were obtained in freshly cut rough-sawn boards that were soaked in water immediately before diffusion treatment.

Core retention obtained in partially air-dried boards were unsatisfactory.

N.Z. FORESTRY RESEARCH NOTES

COMBINED TAPER AND VOLUME TABLES FOR UNTHINNED *P. RADIATA*, AUCKLAND, NELSON, CANTERBURY, AND SOUTHLAND. By G. Duff and S. W. Burstall, No. 1. 1955.

Combined taper and volume tables for New Zealand grown *Pinus radiata* are presented for each of four conservancies: Auckland, Nelson, Canterbury, and Southland. Each set includes tables showing cumulative volumes in cubic feet and diameter (inside bark) at stated heights above ground, total stem volumes, and merchantable volumes to stated top diameters (inside bark), for defined single inch diameter breast height and 10 ft. total height classes. A general introduction describes the layout, purpose, preparation, and testing of the tables. The number and extent of the basic data and the results of the statistical accuracy tests of each of the stem volume tables are summarized and briefly discussed.

KNOT SEALER AND PAINT SERVICE TEST ON *RADIATA* PINE WEATHERBOARDS. By T. A. Foley. No. 2. 1955.

The results of exposure tests of two knot-sealing treatments applied to radiata pine (*Pinus radiata*) weatherboards are presented. The effectiveness of the treatments has been assessed on the basis of the time lapse before paint breakdown over the knots, the relative degree of paint degrade, and the length of exposure time before repainting was considered necessary.

Of the two knot sealer tests, formulation I (Polyvinyl Butyral type) performed better than formulation II (Shellac type.)

Some useful information on the life of a general purpose paint on radiata pine was also derived from the test.

FOREST RESEARCH INSTITUTE TECHNICAL PAPERS
COMPARATIVE TESTS WITH WOOD PRESERVATIVES. By
D. R. Carr, No. 4. 1955.

Comparative tests to obtain information on the relative effectiveness and permanence of certain wood preservatives when tested against commonly used test fungi and to compare the effectiveness of these preservatives when tested under New Zealand conditions on New Zealand grown *Pinus radiata* are described. The tests are divided into

four groups: (i) accelerated graveyard tests; (ii) artificial weathering or leaching tests conducted in conjunction with wood-block-soil decay tests; (iii) natural weathering tests; and (iv) corrosion tests.

The following preservatives were used: zinc chloride, zinc sulphate, sodium chloride, borax, sodium pentachlorophenol, chromated zinc chloride, copperized chromated zinc chloride, acid copper chromate, zinc Chrome arsenate, copper zinc chrome arsenate, copper chromate arsenate mixtures, zinc meta arsenite, copper arsenite, fluor chrome arsenate phenol, pentachlorophenol, copper naphthenate, creosote (two types), tar oil, creosote/fuel oil mixtures.

The tests are still in progress, but the results obtained to date indicate that materials like sodium chloride and the fuel oil tested have no significant preservative value. Of the preservatives of coal tar origin tested, it would appear that creosote (New Zealand) in retentions higher than 5.0 lb./cu. ft. are essential for the preservation of timber used in contact with the ground.

Of the oil soluble type preservatives tested, timber treated with copper naphthenate is susceptible to attack by *Poria vaporaria*. Significant losses of pentachlorophenol can occur from treated timber in spite of the low solubility of pentachlorophenol in water.

Of the water soluble preservatives tested, borax, sodium chloride, zinc chloride, and zinc sulphate leach rapidly. Where no leaching occurred, borax showed high fungicidal properties. Of the multi-salt preservatives tested, the resistance to leaching of the various components is relative rather than absolute. However, they all showed resistance to leaching, but two components of fluor chrom arsenate phenol, namely, sodium fluoride and dinitrophenol, showed high leaching losses. The most satisfactory results were obtained with copper zinc chrome arsenate, which was very resistant to leaching and was effective against all fungi. Timber treated with acid copper chromate was very resistant to leaching, but was attacked by *Poria vaporaria*. Timber treated with fluor chrome arsenate phenol and zinc chrome arsenate was attacked by *Lenzites trabea*.

The tests indicate the value of multi-salt wood preservatives not only for the important requirements of overcoming resistance to leaching when used "outdoors" or in contact with the ground, but equally for overcoming attack by fungi which may be tolerant to specific metals such as copper or arsenic.

HEARTWOOD FORMATION IN *PINUS RADIATA*. By J. Mad-dern Harris, No. 5. 1955.

The aspiration of the bordered pits of wood tracheids from the outermost growth layer to the heartwood in the stem of *Pinus radiata* has been observed to be a continuous process and one which can be related to the degree of saturation of the wood with water.

It is shown that the percentage of pits aspirated in the inner sap-wood can be considered to impose a discontinuity-barrier between

the dry-wood surrounding the coloured heartwood and the wet sapwood.

A physiological system is suggested which would explain how *P. radiata*, subject to recurrent physiological drought, retains a maximum volume of sapwood of water conduction and storage.

WELLINGTON BOTANICAL SOCIETY BULLETIN

VEGETATION OF THE MIDDLE CLARENCE VALLEY. By D. R. McQueen. No. 27, 8-13. 1954.

Discusses and locates the different plant communities within the area under the headings Beech forest, Mountain Totara, and Lacebark forest, Manuka and Kanuka scrub land, Tussock grassland, and Sub-alpine scrub.

NEW ZEALAND ENTOMOLOGIST

RECORDS AND OBSERVATIONS OF NEW ZEALAND LEPIDOPTERA. By K. A. J. Wise. 1 (4). 27-30. 1954.

(1) Report on the Oak-leaf Miner: *Lithocolletis messaniella* Zeller (Gracillariidae) was found in oak and silver birch at Hamilton, oak and chestnut at Cambridge, oak at Nelson, and in oak at Kumeu. Two main host plants in Auckland are Apple (*Pyrus malus* L., Fam. Rosaceae) and Ornamental Cherry (*Prunus* sp. (Fam. Rosaceae)). (2) Leaf-roller Damaging Elm Twigs: *Tortrix excessana* (Walker) (Tortricidae) was damaging *Ulmus*. Larvae had bored into leaf scars and tunnelled under the bark. One larva after leaving the tunnel ring-barked the twig and later fed on the leaves. Apparently larvae can over-winter beneath the bark of elm and emerge in the early spring to feed on bark until leaves appear. (3) Records of Rare Lepidoptera: *Deilephila celerio* (L.); *Achaea janata* (L.); *Venessa cardui* L.; *Precis villida* (Fabr.).

NEW ZEALAND SOCIETY OF SOIL SCIENCE PROCEEDINGS OF FIRST CONFERENCE

THE GROWTH OF EXOTIC FOREST TREES ON CERTAIN SOILS AT TAIRUA FOREST, COROMANDEL. By C. G. Vucetich and G. C. Weston. Vol. 1, 1955.

At Tairua, free-draining soils from recent volcanic ash showers contrast with impervious clays derived from Tertiary rocks, and the topography/soil complex has influenced strongly the development of exotic forests established there since 1930. Some 35 plots, each tested for soil uniformity, were laid out in older stands of nine exotic species, sampling six broad soil types. Radiata pine has produced good healthy stands on the deeper ash soils, but trees become unthrifty

on shallow soils with impeded drainage. Patula pine seems to have similar soil requirements. Age for age, loblolly pine has out-produced radiata pine on the best sites, and is more tolerant of impeded drainage. Slash pine yields high volumes on good soils, and, moreover, will tolerate strongly leached and podzolized soils. Corsican pine remains healthy and grows steadily, though slowly, on shallow soils on steeper, more exposed sites. Maritime pine is very tolerant of podzolized soils and heavy clays, and may be useful for difficult sites if better provenances can be obtained. The limited plantings of longleaf and shortleaf pines and Douglas fir are not impressive, even on the best soils in the forest.

FOREST RESEARCH NOTES

COMBINED TAPER AND VOLUME TABLES FOR *PSEUDOTSUGA TAXIFOLIA* ROTORUA; *PINUS NIGRA* VAR. *CALABRICA* ROTORUA; AND *PINUS RADIATA* ROTORUA. By G. Duff. Vol. 1. No. 12, 1954.

NEW ZEALAND JOURNAL OF AGRICULTURE

- TREES ON THE FARM: PLANNING A WOODLOT. By W. H. Jolliffe. Vol. 90, No. 4, 1955.
- TREES ON THE FARM: PLANTING TECHNIQUE. By W. H. Jolliffe. Vol. 90, No. 5, 1955.
- TREES ON THE FARM: CHOICE OF SPECIES. By W. H. Jolliffe. Vol. 90, No. 6, 1955.
- TREES ON THE FARM: TREE GROWING ON SAND DUNES. By W. H. Jolliffe. Vol. 90, No. 7, 1955.

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