IN NEW ZEALAND CONTEMPORARIES

NEW ZEALAND JOURNAL OF AGRICULTURE

FARMING IN NEW ZEALAND: NORTH ISLAND SOILS: L. I. Grange, Vol. 70, No. 4, April, 1945. SOUTH ISLAND SOILS: L. I. Grange, Vol. 72, No. 6, June, 1946.

The author, who is Director of the Soil Survey Division of the Department of Scientific and Industrial Research, introduces his subject with a brief description of the part played by the parent rock, climate, vegetation and topography in the formation of soils. While the vegetation is largely controlled by climate and soil, the soil itself is conditioned to a great extent by the vegetation it supports. Plants which take much from the soil return much to it, tending to keep it in a state of high fertility. Thus puriri is recognized as an indicator of fertile soils owing to its high demand for lime, potash and phosphate which are returned in a readily decomposable form. Taraire and tawa are moderately efficient in developing a mellow and fertile top soil, but totara, rimu and beech much less so. Kauri demands even less from the soil so that its litter contains little lime or other plant foods. This litter is acid and decomposes but slowly, resulting in the accumulation of a peaty acid humus in which are retained many of the minerals previously drawn from the soil. Under these conditions the soil becomes poorer both from the slow return of minerals and from the leaching of bases under acid conditions.

The main soil types and their chief sub-divisions are described together with their occurrence, characteristics and farming potentialities. The North Island soils present more variety due to a greater range of parent rocks. In the South Island the characteristic parent materials are greywacke and schist, and climate is the dominant modifying factor. Loess laid down in a period of extensive glaciation and the tussock soils on the eastern side of the main divide are products of conditions not met with in the North.

These articles are supported by soil maps of both islands and profile photographs of the main soil types.

SOIL EROSION: J. E. Bell and D. A. Campbell, Vol. 71, No. 6, December, 1945

This article approaches New Zealand's soil erosion problems on a broad and popular basis stressing the national importance of soil conservation and describing the constitution and objectives of the Soil Conservation and Rivers Control Council and the Catchment Boards.

After an historical survey of the original vegetation and its modification in land development, an account is given of the main forms of man-induced erosion. Pasture deterioration is seen as the prime cause of soil losses; and the building up of the sward by the avoidance of over-grazing, control of burning, increased use of cattle, topdressing and rabbit control as the chief means of prevention.

It is admitted that improved pasture management alone will not eliminate soil erosion in all cases, particularly the slipping and slumping of mudstone country. Tree planting is advocated firstly to stablilize gully bottoms, with or without debris dams, and secondly at a wide spacing to hold unstable slopes.

PRESERVATIVE TREATMENT OF FENCING POSTS: Contributed by the N.Z. State Forest Service, Vol. 72, No. 2, February, 1946.

Creosote is recommended for preservative treatment of posts on the farm; a simple home made hot and cold bath plant is described and a treating schedule given for the main indigenous and exotic timber species.

Emphasis is placed on the necessity for preparatory barking and seasoning for at least six months. If possible the whole of the sapwood in the portion of the post in contact with the ground should be impregnated. Where this is not feasible a penetration of from ½ to 1 inch should be aimed at, though it is not always obtain-

able in larch or other refractory woods. A lighter treatment of the part above ground is recommended but fairly substantial top penetration is necessary in naturally non-durable wood in high rainfall districts if decay from the top downwards is to be avoided. An absorption of from ½ to 1 gallon of creosote per post can be expected, and a life of about 20 years should be obtained.

STUDIES IN FARM MANAGEMENT: A NORTHLAND HILL-COUNTRY FARM: E. H. Arnold, Vol. 72, No. 3, March, 1946.

The purpose of this article is the description of developmental and management practices on a hill-country farm in the Whangarei district. The methods adopted in dealing with soil erosion are of particular interest to foresters and soil conservationists.

Both sheet and slip erosion are causing concern on the moderately steep to steep hill sides of granular loam and clay. It is admitted that some of the steeper parts should have been retained in forest, and natural regeneration of scrub and forest is being encouraged on them. However, wholesale abandonment of this hill country, possibly to forestry, is condemned, as, with the judicious use of binding grasses and trees, it is contended that stability can be achieved.

Exotic trees have been planted to some extent, mainly for shelter, but totara regenerates freely on this country and can develop without protection from stock. The owner proposes to supplement natural regeneration by raising 2,000 totaras annually for planting on the hill sides.

FARM SHELTER: T. E. Rodda, Vol. 72, Nos. 3, 4 and 5, March, April and May, 1946.

In a series of three articles farm planting is dealt with comprehensively, from planning and layout to details of species and their propagation. Various types of shelter are considered: high and low windbreaks, hedges, shade for stock and for controlling weed growth in drains, the protection of homesteads and the production of timber and firewood supplies. Various species are discussed in relation to soil and climatic requirements, and emphasis is placed on careful ground preparation, planting and after care, particularly on the necessity for adequate fencing. The author gives particular consideration to the establishment of shelter in exposed coastal situations giving details of composite belts combining low and high shelter and resistance to saline winds.

It is felt that the claims made regarding the suitability of various eucalypts for sawn timber and posts might have been qualified by reference to age and conditions of growth. The efficacy of tar as a wood preservative is also open to question.

HOW TO DEFEAT WOOD-BORERS: J. H. Smith and A. C. Forbes, Vol. 72 No. 4, April, 1946.

The most important wood borers in New Zealand are the common house borer (*Anobium domesticum*), the powder-post beetles (*Lyctus* spp.), the native two-toothed longhorn (*Ambeodontus tristis*), the native termite (*Calotermes brouni*) and the introduced Australian termites. The insects, their life histories and characteristic damage are described. The necessity for a thorough examination of every piece of wood both before and after undertaking treatment is emphasised. Treating materials must combine toxicity, high penetration, safety in handling and cheapness; in buildings they must also be clean, colourless, odourless, paintable and non-swelling. Only those which are both safe and easily obtained are considered in this article.

Creosote is recommended for exterior work or interiors where its smell is not objectionable. For the interior of houses, surfaces to be painted or furniture the following solution is preferred: 5 parts by weight of pentachlorphenol, 94 parts

of light diesel oil or kerosene and 1 part of pine oil. Water solutions of such toxic salts as zinc chloride are suitable only for treatment of timber before being put into use owing to the resultant change in moisture content.

Methods of treatment are described and the necessity for reinspection and constant vigilance to obtain complete immunity is stressed.

The introduced Australian termites call for special methods of treatment and infestations should be reported to the local authority without delay.

EROSION CONTROL ON EAST COAST HILLS: V. P. Boot, Vol. 72, No. 4, April, 1946.

The soft mudstones of Poverty Bay present one of the most spectacular and serious erosion problems in New Zealand. Following the removal of the original forest there has been severe slipping and slumping. Accelerated runoff has resulted in the soft toes of the hills being eaten away, thus setting in motion erosion processes of considerable magnitude.

Over a period of 40 years counter measures have been undertaken on Puketiti Station of 6,500 acres near Te Puia Springs with considerable success. Pastures have been improved by top dressing and an increase in the proportion of cattle to sheep. Some of the more extensive slumped areas have been fenced off; one of the most seriously affected was closely planted with *Pinus radiata* and *Cupressus macrocarpa*; another with willows more widely spaced. In both cases stability has been achieved and the latter is again being grazed. Streambeds and unstable toes have been controlled by the planting of willows and poplars closely along the banks, with these and other trees widely spaced on unstable surfaces. Sometimes it has been necessary to supplement such planting by groins and debris dams.

It is emphasized that each problem must be given individual study to ascertain the causes of erosion and plan remedial action. At Puketiti it was found more expedient to fence off the whole of the area being treated for about four years rather than attempt protection of individual trees, though it is admitted that this might not be feasible under other conditions. Poplars and willows are planted as poles at least 11 feet long with 3 feet 6 inches in the ground and thoroughly rammed.

NEW ZEALAND GEOGRAPHER

BURNING TUSSOCK GRASSLAND: A GEOGRAPHIC SURVEY: K. B. Cumberland, Vol. 1, No. 2, October, 1945.

This paper is based mainly on the results of a questionnaire addressed by the North Canterbury Catchment Board to pastoralists in the high country and foothills between the Ashley and the Rakaia Rivers. The problems of burning vary considerably within this area with variations in climate, soil and vegetation. The author distinguishes three major climatic regions: (a) the frontal ranges and foothills subject to the influence of south-easterly, southerly and south-westerly winds and with an annual rainfall from 45 to 60 inches; (b) the interior basins with a "semi-continental" climate and a total rainfall of less than 35 inches; (c) the deep interior approaching the main divide and having a rainfall of 45 to 100 inches. In both the front country and the deep interior gramineous vegetation is considered to be largely induced and the aggressive tendencies of native and exotic shrubs a reflection of an ultimate forest potential.

Virtually all runholders found it necessary to burn; only to a limited extent and at intervals of from five to twenty years in the drier natural grassland zone, but every three to five years in the wetter zones. Generally there is much less burning than in the past and rarely is it done without discrimination. The main reasons given for burning were (in order): to keep down scrub, ; to destroy dead and rank tussock; to obtain better access and make for easier mustering; to ensure safety from outside fires; to provide more or better grazing.

The pros and cons of burning and its alternatives are discussed. These alternatives are: more cattle, fencing, subdivision of large blocks, surface sowing

of bare and eroding slopes, cultivation of arable flats, controlled grazing and spelling, separation of sunny and shady faces, abandonment to potential forest of damp and scrub-problem areas, and the provision of shelter belts and wind breaks.

All these measures are largely out of the question at present because of lack of finance, security, labour and materials. But the author stresses the importance of retaining at least a substantial part of this back country in production, and points the way in which this might be done by a stocktaking survey of these lands, provision of technical assistance, revision of rentals, institution of subsidies, compensation for improvements and full security of tenure as the nation's contribution to this end.

TUSSOCK GRASSLAND OR STEPPE? : H. H. Allan, Vol. 2, No. 1, April, 1946.

"When words from the vernacular become fashionable, and at the same time technical, woe betide the reader." The term "steppe" has been applied by the geographer, the climatologist, the pedologist and particularly the plant-ecologist to such a wide range of concepts that it is impossible to find general agreement on what it connotes. "In comparative studies it is difficult to keep clearly in mind all the shades of meaning evolved. It is to be feared that the 'ever-misleading term "steppe" ' will continue to mislead rather than assist the reader. The more we use the same terms the more we mean different things." Consequently Dr. Allan suggests that "steppe" as an ecological term should be abandoned in favour of the less confusing "grassland." Classification of grasslands is highly desirable, but until we have much more exact knowledge of their ecology, soils and climates it makes for confusion to apply the term "steppe" to our indigenous grasslands.

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LOGGING AND SAWMILLING METHODS AND IMPROVEMENTS NOTED OVERSEAS : N. J. Dolamore, Vol. 28, Nos. 10 and 12, October and December, 1945 ; Vol. 29, No. 5, May, 1946.

This series of articles gives a short account of a recent visit to the United States, Canada and Sweden made by Mr. N. J. Dolamore, Conservator of Forests, Rotorua. The utilisation-minded forester will find much to interest him in the detailed descriptions of recent developments in all phases of logging and milling. Particular attention is given to portable power-saws, log-barking equipment, utilisation of waste-wood and gang-frame milling ; in other words to those processes which are likely to be introduced or to become more common in New Zealand as the exotic forest industry expands. The last article of the series deals exclusively with Sweden and gives a concise and revealing picture of the extraordinary manner in which that country succeeded in gearing its war-time economy to the one raw product, wood.

THE KILN DRYING OF TIMBER : H. R. Holt, Vol. 28, Nos. 7 and 8, July—August, 1945.

Textbooks on kiln drying are numerous and a very necessary background to what is essentially a technical process. The short essay under review gives a very lucid explanation of many features of kiln operation in New Zealand which are not assembled in any textbook. Opinions differ on schedules to be used, on the stage at which circulation should be reversed and other minor points concerned with the "art" of kiln drying—this is where the experienced operator plays his part. There can be but little quarrel with the basic principles introduced by the author—the scientific bases of the process.

THE TIMBER BORER AND ITS CURE : Vol. 29, No. 1, January, 1946.

Extracts from a paper by Mr. A. R. Brimblecombe on the relationship of starch content to *Lyctus* attack of Queensland timbers are collected under the

above heading which is apt to be somewhat misleading to readers in New Zealand who are more familiar with the *Anobium* borer. One of the very early references to starch content in relation to borer attack of timber was by a New Zealand observer, Prof. H. B. Kirk, writing in the Transactions of the N.Z. Institute about kahikatea. However, the substance of the article under review is that a remarkable degree of success was attained in immunizing several timbers susceptible to *Lyctus* attack by a light ring-barking at the top of the commercial bole of standing trees. It is timely when attention is being focussed more and more upon tawa, taraire and other New Zealand hardwoods whose susceptibility is a brake to their wider usage.

DEVELOPMENT OF FOREST PRODUCTS: Charles Lynch, Vol. 29, No. 6, June, 1946.

A short review of some aspects of the work of the Forest Products Division, C.S.I.R., Australia, is given. This institution has developed especially during the war period into one of the most vigorous forest products laboratories in the world. New Zealand's interest lies partly in the increasing amount of technical data available on Australian woods used locally, but to a greater extent in the related problems of our two countries, which have been almost equally prodigal with their forest resources, and in the conservation and better use of our timbers.

KILN DRYING OF TAWA: J. S. Reid, Vol. 29, No. 12, December, 1946.

The increasing importance of tawa (*Beilschmiedia tawa*) for furniture, interior woodwork and turned products calls for a better appreciation of its seasoning problems. It dries more easily than most hardwoods, but in the green state is highly susceptible to damage by boring insects and by rot and staining fungi, so that block-stacking should be reduced to a minimum. Similar deterioration is apt to occur in air-seasoning stacks while attack by powder post beetles occurs in partially seasoned and freshly seasoned wood. Consequently yard hygiene is of considerable importance.

The author discusses the factors involved in kiln drying and their bearing on the particular characteristics of tawa. Drying schedules are given for 1 to 1½ inch stock and for thicker sizes. The black heart of the species is prone to collapse on all drying schedules without a preliminary air seasoning for 4 to 6 months. Mould development is apt to be troublesome but can be avoided by having no interruptions in the treatment of the charge and by steaming at 160° F. to kill both the moulds and their spores at the outset, and, if necessary, again later.

It is pointed out that tawa sapwood is not readily distinguished from the wood outside the black heart. Sapwood is prone to attack by *Lyctus* but the short lapse of time between kiln drying and manufacture of the finished product greatly reduces the chances of infestation provided a sealing coat is applied to all surfaces of the finished article.

PREVENTION OF SAP STAIN IN INSIGNIS PINE: J. H. Smith, Vol. 29, No. 12, December, 1946.

Pinus radiata is highly susceptible to sap stain, the presence of which is often an indication that conditions have been favourable for the development of incipient decay as well.

The nature of sap stain, conditions of growth and principles of control are explained. The desirability of prompt conversion of logs and avoidance of delay in stacking for seasoning after sawing is stressed, but it is admitted that in most localities it is almost impossible to ensure that staining will not occur during air seasoning. Kiln drying is the most satisfactory solution but various chemical dips are effective. The nature of various proprietary anti-stain solutions and their application are discussed. The cost of chemical sap stain prevention should not exceed 2d. or 3d. per 100 ft. B.M.

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BIOLOGY OF ANOBIUM PUNCTATUM (PROGRESS REPORT): J. M. Kelsey, D. Spiller and R. Winsome Denne, Vol. 27, No. 1 (B), July, 1945.

This report, after a brief review of literature relating to *Anobium punctatum* de Geer in New Zealand, describes the techniques used in rearing the borers with the object of utilising them as test insects to evaluate timber therapeutants. A method for the sexing of the beetles is described, sexing being necessary when placing the beetles in cages for egg laying in order to compare results. The investigation showed that *Anobium* does not confine its attention to timber as it was found in wood fibre wall board and in the cardboard filling of a leather suitcase, exit holes being very prominent in the leather.

ERECHTHIAS FULGURITELLA WALK. (LEPIDOPTERA) INHABITING PINE CONES: E. S. Gourlay, Vol. 27, No. 3 (B), November, 1945.

Associated with cones of *Pinus radiata*, a native moth, *Erechthias fulguritella* is recorded from the Nelson Province. Its larvae invariably destroy the seed in infested cones but have a negligible effect at present on seed production.

A NOTE ON REARING ANOBIUM PUNCTATUM DE GEER: J. M. Kelsey, Vol. 27, No. 4 (B), January, 1946.

The description of a new technique for inducing *Anobium punctatum* to oviposit on smooth wood surfaces is recorded. The usefulness of the method lies in the possibility of being able to count every egg laid, so increasing the value of analytical interpretation of the results. Comparisons are made with previous techniques.

JOURNAL OF THE ROYAL NEW ZEALAND INSTITUTE OF HORTICULTURE

AFFORESTATION OF WASTE LAND AND RESERVES: P. Black, Vol. 15, No. 2, January, 1946.

The Superintendent of Parks and Reserves, Palmerston North, here makes a plea for the afforestation of land below economical farming level. He is concerned primarily with the coastal sand-dunes fringe between Wanganui and Wellington and with those lands, once farmed, which are now infested with fern, gorse, broom, lupin and other weeds. After discussing the desirability of establishing plantations near centres of population, and the ability of forests to grow on soils incapable of supporting a farm crop, Mr. Black advocates the use of exotic conifers rather than hardwoods or indigenous podocarps. Particular points made are that none of the podocarp species is adapted to pure forest culture but that exotic conifers are suited to a wide variety of sites; and their subsequent value will consist not only of timber, but also of potentially valuable raw material in the form of cellulose. Afforestation in the higher watersheds and on the coast could be undertaken by the Catchment Boards with advantage.

EXPERIMENTAL SEED STORAGE: Miss A. M. Macmorran, Vol. 15, No. 3, April, 1946.

This is a preliminary report on seed storage methods commenced by the State Forest Service, Wellington, in 1941. The investigation covers seed of nine coniferous tree species, three of which are indigenous and six exotic, and is being carried out to determine the effect of long term storage on viability. It has been in progress three years, and each year a quantity of seed has been removed and examined for germination tests, these being carried out in the laboratory and in the soil. It is not possible at this stage to give any final figures as the seed is to be stored for 10 years or longer with annual or biennial testing as results indicate. Preliminary results show that seed stored at temperatures of 35°F. give better germination results than that stored at room temperatures of 33—78°F. So far *Pinus radiata* shows no significant loss of viability whether stored at room temperatures or at 35°F. over the period 1941-44.