HISTORY OF FOREST HEALTH SURVEILLANCE IN NEW ZEALAND

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ABSTRACT

Forest health surveillance in New Zealand was initiated in 1956 after insect attack triggered concern about the susceptibility of exotic forests. Surveillance techniques and scientific support developed as the types and areas of greatest risks were identified from operation reviews. The detection of newly established forest insects and fungi has become the top priority and surveillance has extended to port environs. A Forest Disease Contingency Plan formalises actions when new introduced insects and fungi are detected, and a computerised forest health database has been established for records going back 25 years. A "user-pay" system to cover the cost of surveillance and scientific back-up was intitiated in 1987. A Forest Health Advisory Committee involves industry in planning and advising the Government on matters pertaining to forest health.

Keywords: forest health; forest surveillance; introduced insects; introduced diseases.

HISTORY

Prior to the 1920s when exotic forestry in New Zealand was emerging as an industry in its own right, research on forest health problems was minimal and mainly followed scientific interest. A major exception was the work of T.W. Kirk in 1908 on the biological control of *Eriococcus coriaceus* Maskell on *Eucalyptus* spp. During the 1920s D. Miller and G.H. Cunningham acted as entomologist and pathologist respectively for the newly formed Forest Service (de Gryse 1955). From 1930 to 1938 this work was continued by A.F. Clark and T.C. Birch.

In 1938 G.B. Rawlings was appointed entomologist/pathologist to the Forest Service and, apart from a break during the war years, he continued until 1962. A Forest Pathology Branch was part of the new Forest Research Institute when it was established in Rotorua in 1947. From this date staff numbers gradually built up to a peak in the early 1980s when there were 12 scientists. Since then there has been a decrease to the present six scientists.

Two events heightened concern that perhaps our commercial exotic forests were at risk from disease attack. From 1946 populations of introduced woodwasp *Sirex noctilio* F. built up in unthinned *Pinus radiata* D. Don plantations in the central North Island, reaching their peak in 1949 and causing considerable mortality. In November 1951, epidemic populations of the native looper caterpillar, *Pseudocoremia suavis* Butler, caused severe defoliation to *P. radiata* in Eyrewell and Balmoral Forests in Canterbury. In 1953 concern prompted the Government to engage J.J. de Gryse,

Chief of the Division of Forest Biology Science Service, Department of Agriculture, Ottawa, to "furnish a comprehensive report and recommendations on the essential measures and practices to adopt to safeguard the country's exotic forests from the threat of insect and pathological epidemics" (de Gryse 1955).

In his report, de Gryse (1955) recommended a system of forest health surveillance by means of a detection survey. The task of establishing the Forest Biology Survey (including selection, training, and deployment of 10 field staff) was completed by T.C.R. White and on 6 February 1956 full-time surveillance was commenced. The Survey was controlled from the Forest Research Institute, Rotorua, where facilities and staff had been organised to handle collections and data sent in by the field staff stationed at strategic locations throughout New Zealand. The early emphasis was on monitoring insect populations, particularly those of lepidopterous defoliators, and certain fungal problems in exotic forests. The Survey gradually widened its range of work, even to the extent of conducting special surveys in indigenous forests.

By 1964 a very large amount of data had been accumulated on the dynamics of various lepidopterous populations. It seemed a good time to pause and consider where the future emphasis of forest health surveillance should lie. However, the discovery of *Dothistroma pini* (Hulbary) needle blight of pines by Survey staff in 1965 and consequent evaluation and control work meant that any new considerations were delayed.

It was not until the late 1960s that new concepts of forest health surveillance began to crystalise and be put into practice. This brought a move away from continuous population sampling and a shift towards detecting and investigating forest health problems generally, with emphasis on the early detection of newly introduced insects and fungi and the development of techniques for detecting specified diseases and assessing the damage caused. This involved the development of methods for assessing defoliation levels from the air, particularly in relation to Dothistroma needle blight. From the early to mid 1970s regular surveys of port environs were started, and moves made to initiate stand-type sampling where it was considered there was a higher risk. Regular reporting on forest health conditions was aimed more towards forest managers and more effort was directed at making forest staff aware of forest health problems. Local forest staff were trained to assess Dothistroma defoliation levels themselves.

Since the inception of the Forest Biology Survey, field staff had always had involvement with research experiments. The degree of involvement varied from year to year and with staff, but it was always a considerable commitment. A 1979 major internal review considered the then nearly 30% involvement with FRI trials and implemented a move towards total commitment to detection, surveillance, and damage assessment. The review reiterated the view that detection effort should be concentrated in areas considered to have high risk and recognised the fact that although the total exotic forest estate had more than doubled since 1956 (Ministry of Forestry 1988) staff numbers had only increased from 10 to 13. Exotic forest areas were still dramatically increasing and it was apparent that the level of surveillance prescribed by the review could not be sustained without either increasing staff numbers or making greater use of aerial surveillance techniques.

Subsequently M.D. Ashley, School of Forest Resources, University of Maine, visited New Zealand in 1981 to assess our situation and advise on aerial surveillance

techniques. Since 1982 aerial surveillance has become a routine integral part of forest health cover. A casualty of the reorganisation was that, except for near ports and high-risk areas, health surveillance of small plantations generally under 100 ha was handed over to the Advisory Services Division of the Forest Service after their staff had received some basic training. The title of field staff was changed in 1979 from the original Forest Biology Observer to Forest Health Officer, and then in 1987 to Protection Officer (Health).

The 1980s heralded three major events that were significant to the forest health surveillance system. The first was the introduction of a Forest Disease Contingency Plan in 1982 (New Zealand Forest Service 1982) which defined procedures and responsibilities for action in the event of a new introduced insect or fungus being detected. The second event, in 1985, was the making available of 25 years of forest health data on a national computer network. This meant that all the collection and forest health inspection data were readily accessible to both researchers and field staff. The third and most significant event was the demise of the Forest Service and birth of the Ministry of Forestry on 1 April 1987. It has meant a whole new approach, with forest health surveillance and its associated scientific support being run on a "user-pay" system. The Government has recognised that 30% of forest health work is in the national interest and allocates funds accordingly. Since the start of the Ministry of Forestry the forest health surveillance system has been regionally organised with some national co-ordination from the Wellington Head Office. The activities of quarantine and forest health surveillance are being encouraged to have stronger links in that they follow a common objective in providing forest health protection.

Now that industry is paying for a major proportion of the cost there is a need for representation at planning levels. A Forest Health Advisory Committee with a wide range of industry representation was established in June 1987 with responsibility for advising the Minister of Forestry on matters pertaining to forest health. The Advisory Committee has recognised that forest health surveillance intensity should be related to regional risk and, with assistance from research, the probability of the establishment of forest diseases in different parts of the country has been assessed. A system of surveillance has been designed to provide greatest cover where there is greater risk. To operate successfully the system relies on the goodwill of forest owners who, since the advent of "user-pay", have been made more aware of risks to the health of forests. Legislation has been considered in order to ensure full co-operation, but at the moment forest owners favour a voluntary system strongly backed by their organisation.

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