

and B.P. Glass, published in the *New Zealand Journal of Forestry Science* 15(2):180-194 (1985). An earlier version of this paper was presented at an NZIF conference (Christchurch, 1984).

The choice of journal in which the paper was published (*New Zealand Journal of Forestry Science* rather than *New Zealand Journal of Forestry*) reflected our concern that the results not become the sole basis for accepting or dismissing special-purpose species as plantation/woodlot investments. Indeed, we go to some lengths to mention other mitigating factors which might influence such decisions — including not only aesthetic values, soil and water protection and shelter, as Mr Barton notes, but also the possible consequences and interactions of three different scenarios (Refer to the Sensitivity Analysis Section). Rather than providing the decision-making panacea Mr Barton seems to seek, a primary interest of ours lay in the methodology by which such investment decisions might be made and how these decisions might be improved. Here arise the assumptions to which Mr Barton apparently objects.

Economics is concerned with developing rational approaches to problems of choice — choice in production in this case — by comparison of alternatives in terms of a common denominator. Unfortunately, the complexity of real world problems of choice quickly leads to information overload. Frank Knight (in "Risk, uncertainty and profit" (1921) A.M. Kelly, New York) was perhaps one of the first to recognize this. He pointed out that assumptions allow abstraction of essential elements from the complex reality of choice problems so that "finite human intelligence" (pp. 205-8) can then deal with those problems. Thus the number and nature of the assumptions used in an analysis can be very revealing. As far as our paper is concerned they illustrate just how imperfect our knowledge of special-purpose species is, even when the best available data is examined and in spite of many work-years of effort (to which Mr Barton himself has contributed). Perhaps the best an analyst can hope to achieve, whether forester, economist or some other specialist, is to consciously make the analytical assumptions used explicit. We believe we approached, if not achieved, this standard in our paper.

So our paper pointed out how little we know about special-purpose species. But we contend that our analysis is not devoid of decision-making content, as Mr Barton seeks to imply. For example, with little extra effort further sensitivity analyses can be conducted to determine where further research, analytic and management efforts might pay off most handsomely. Extra or redirected attention and resources can then be allocated accordingly. Such ramifications should be of interest and concern to Mr Barton in his capacity as a Forestry and

Environmental Consultant, if only for the reason that he must advise his clients on how to make their plantation forestry investments most efficiently and with due regard to the uncertainties imposed by available knowledge.

Like Mr Barton, we don't relish the reality of a plantation forestry industry based solely on radiata pine, but we like even less the prospect of plantation forestry investments being made without any form of economic evaluation. If, on face value, economic evaluations provide ambiguous outcomes — as our paper arguably did — then surely this simply shifts emphasis to other complementary and rational means of achieving desired goals. The Special Purpose Species Policy once provided this strategic thrust. Whether this policy can be successfully resuscitated or satisfactory alternatives devised will require, in our opinion, the co-operation of foresters and economists (amongst others) rather than their continuing and apparently expanding alienation.

B.P. Glass and R.Y. Cavana

Editor's Comment: Mr Barton's original letter was abridged and in particular his comments on the paper written by these correspondents were summarized.

User pays and FRI research

Sir,

FRI Directors were disappointed that your editorial in the February issue took such a negative stance when looking at the implications of the Government's "user pays" policy in relation to the activities of FRI. What began as opposition to the change in Government policy became instead implied criticism of how FRI is tackling its new funding environment.

An element of user-pays in Government-funded research is a reality. This year FRI is faced with a budget reduced by almost 25%. This figure will progressively increase to 38% in 1990/91. Government expects its research establishments to respond by either reducing expenditure or earning revenue from other sources, or both.

FRI has responded in both ways. There has already been a reduction in staff numbers of close to 10% through attrition and early retirement. However, the FRI is recognized both here and internationally as a highly productive research institute partly because it has a broad-base of skills relevant to all aspects of forestry. We are actively pursuing earning opportunities in order to maintain the strength which comes from the interaction of our diversely trained and highly motivated staff.

We have virtually achieved our targets in 1986/87, the first of five years of progressive reduction in net funding from Government. The Institute has found the rate of change difficult to adjust to and we do not underestimate the increasing

difficulties that lie ahead. However, the scientific staff have responded very positively to the challenge. Some changes in our relationships with the people in the sector we are here to support are inevitable. Now they must pay for some things that were free before, and some information must be confidential to individual clients.

As you said, there are some dangers in the user-pays principle. We intend to avoid those dangers. Highly trained scientific staff at FRI will be spending their time and energy doing research rather than pursuing sponsorship. The pursuit of 38% of FRI's budget will not dictate the direction of the other 62%. The user-pays principle will not lead to a drop in scientific standards with less scrutiny of work before publication. Contract work will be referred, but in this case it is the client who will set the requirements and assess the real value of work done in that way.

We believe that there is now even closer participation of the Forestry sector in the research process. There are opportunities for advice and scientific scrutiny which otherwise would not occur. Research co-operatives, for example, can actually increase accountability in terms of evaluating the scientific worth of research. The five research co-operatives which have been formed so far at FRI draw together all those interested in applying the results of a special project or programme. Co-op members, along with research staff, set goals and objectives, design a programme and interpret results. This does not preclude scientific peer review and publication of scientific papers. It is important to note that peer review for publication traditionally takes place after the experiments have been completed and the data have been interpreted. Co-operatives provide the opportunity for constructive input into why and how the research is being done. Co-operative research is often very good research because it is well focussed, planned, co-ordinated, executed, and efficiently applied.

Scientific scrutiny of computer-based models can be a problem with or without the user-pays principle. FRI has addressed this by setting up refereeing panels to scrutinize the major model systems produced, and to ensure that the empirical relationships used are valid. Our software manager has the responsibility of ensuring that software is fully referred before release or substantial use by outside clients.

Our future objective is to maintain the strong, long-term research programmes on which the Institute's past success was based whilst pursuing necessary levels of revenue-earning activity.

J.A. Kininmonth,
Regional Director of Research,
Forest Research Institute,
Rotorua.