PEST MANAGEMENT IN SOUTHERN FOREST NURSERIES - WHAT NEXT?

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INTRODUCTION

When I accepted this assignment as a paper session moderator, I did so with the perhaps naive conviction that in so doing I would immediately acquire some degree of immunity from the pressure to prepare a manuscript and a formal presentation. So much for convictions. In his letter of confirmation Bob Schroeder told me that the "topic overview" I'd be presenting would "require some special thinking", and that it might be "appropriate to discuss the concepts of pest control in a nursery, ... historical aspects, what the pests are, how we deal with them, etc., etc. He finished his instructions by saying "you can wander if you wish, *as* I'm sure you will." While I'm still uncertain as to the basis of Bob's apparent belief that I'm prone to "wander", I've decided to do just that - by permission you understand, and at the same time hopefully to stimulate some "special thinking."

SITUATION

Strategies and methods of pest management in southern forest nurseries have undergone substantial changes in the past ten years. Noteworthy developments include a) the testing, registration, and utilization of highly sophisticated herbicides for weed control, and b) the development and implementation of Bayleton-based programs for control of fusiform rust. Routine pest "management", however, all too often consists of some form of detection, identification, and reaction to pest problems ex post facto; i.e., "crisis management." Often our reactions are based more on fear of the unknown than on documented biological and economic realities. Indeed, some common preventive controls are applied cost ineffectively in "anticipation" (or fear?) of pest problems which in actuality never materialize.

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How many nurserymen have sprayed a fungicide or insecticide in response to a pest "problem" when in fact the pest was perhaps not a pest in the sense of posing an economic or managerial threat, or the pest had completed its activity by the time of its detection, in effect rendering the spray unnecessary and waste of money? I suspect such activity is widespread. I know it occurs in Florida. At times pesticides are applied as political or managerial placeboes. Sometimes they are applied as "insurance" when in fact their efficacies are unknown, and in all probability slim to none at the time of application.

In my judgement, pest mangement specialists, and more particularly pathologists share in the responsibility for such actions. We have, to varying degrees, failed to determine biological and economic impact data for certain pests and/or we have done an inadequate job of communicating such information to nurserymen. Without such information, how can nurserymen be expected to make sound management decisions? For example, how many nurserymen know whether or not they need to fumigate their seedbeds prior to the actual conduct of the operation? I suspect very few. Unfortunately, we have not developed the capability of risk assessment and pest or disease damage forecasting to a level such that we can provide nurserymen with reliable and economically justifiable "treat" or "no treat" recommendations for many nursery pests. On what basis then does a nurseryman decide to fumigate or not?

A quick examination of some recent pest management articles provides a humbling assessment of important aspects of the state of the art in pest management. Much of this is directly applicable to pest management in forest tree nurseries.

> "No well-developed economic thresholds for insect or mite species/pine species have been established for southern forest tree nurseries."
>
> Dixon & Foltz (1984)

> "No attempt has been made to integrate life table information into a nursery IPM program.
>
> Mexal (1984)

> "Most forecasting systems take it for granted that treatments pay. The assumption may be correct for...diseases of an explosive nature, but it is not necessarily correct for diseases of the slow-and-steady type."
>
> Zadoks (1984)

"Financial aspects are seldom mentioned in disease warning studies, and action thresholds are rarely established."

Zadoks (1984)

"Prediction of disease losses is not regularly attempted in forest nurseries because of the many unknown variables. Clearly, acquisition of a comprehensive body of data on disease frequencies and timing, amounts and sources of inoculum, various environmental factors, and stages of seedling development must be a priority objective for nursery pathologists. Such data are essential if pathologists want to progress from a crisis-oriented to a crop-health maintenance approach to nursery disease management."

Bloomberg (1985)

OPPORTUNITY

Clearly there exist deficiencies in the information we pest managers provide to nurserymen. Efforts need to be concentrated toward determination of threshold damage levels which economically justify expensive treatments for specific nursery pests. Perhaps more importantly we need to refine out abilities to forecast potentially important pest problems based on meaningful and measurable determinants. In my opinion pest activity forecasting (i.e., predicting pest occurrence, damage levels, and economic impacts,-- ante factum) remains perhaps the most important virgin arena for significant contributions to forest nursery management by nursery pest specialists. I believe this is especially true for nursery pathologists. In 1978 Jim Rowan stated "no attempt has been made to determine if soil population counts of these fungi (S. bataticola & F. solani) are related to disease severity" in forest tree nurseries. He made a limited effort to do so, but with inconsistent results (Rowan 1978). I for one, am not ready to accept that nursery root disease hazards cannot be acceptably forecasted on the basis of pre-fumigation soil propagule counts. Should such a capability be developed, I believe that substantial nursery management cost reductions could be realized with acceptably small risks of disease losses *via a)* extending the interval between soil fumigation treatments within forest nurseries and/or b) systematically deploying budget-limited supplies of soil fumigant to nursery compartments determined to pose higher risks of root disease.

The Florida Division of Forestry is currently developing plans to initiate *a* pilot program to monitor dynamics of, and disease losses associated with populations of key soil-borne root pathogens in relation to forest nursery management practices. Cooperation is being sought from the University of Florida and the U.S. Forest Service. It is anticipated that this effort will run initially for a period of 3-5

years at which time critical evaluations will be made re continuation, refinement, utility and expansion of same. Our goal is to develop guidelines and methodologies with which to provide nurserymen on a regular basis with meaningful and useful pre-fumigation soil assays as an assessment of risks associated with various potentially dangerous root pathogens. Such a program is admittedly ambitious and will not be without frustrations. Nonetheless, we're planning to give it a shot.

> "The way of nature is so impervious that howfarsoever we go, the surmounting of one difficulty is still to give us the prospect of another. But if little should be effected, yet to design more can do us no harm, for though a man shall never be able to hit the stars by shooting at them, yet he shall come much closer to them than another that throws at apples."
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> Nehamiah Grew (1682) The Anatomy of Plants. London. Published by the author. Presented to the Royal Society.

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