

Root Tuber Technology Transfer

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Abstract

The transfer of technology on root and tuber production is critically important. Farmers, the ultimate beneficiaries of new information and technology, must be kept informed to make research efforts worthwhile. Technology transfer techniques are described. Experimental farms are important for conducting agricultural research but can also serve to educate farmers. On-farm tests and demonstrations can effectively illustrate recommendations and have the advantage of local visibility. Growers' meetings provide opportunities for instruction, updating recommendations and dialogue with farmers. Publications should be designed to respond to specific needs to be most effective.

Introduction

The critical link in the generation of meaningful scientific knowledge is to put that knowledge into the hands of the users. Information in data books, on computer memory banks, in scientific reports and on library shelves is important. But, we have not fulfilled our obligation to our clients until we've done everything possible to pass this information on to them. Our final responsibility to those for whom we are generating this information is to help them interpret it in terms they could easily understand. Most root and tuber growers can only appreciate new and useful information when it is presented to them in the context of their production systems.

Research on roots and tubers is being conducted in six continents. Root and tuber crops provide significant amounts of food and nutrients to people around the world. For most information to be useful in a specific location, it must be developed in that location or in similar regions in order to be applicable to the unique needs of those growers. Research is generally best conducted under the controlled conditions of laboratories, phytotrons, growth chambers, greenhouses and experimental farms. Results of such research are important to root and tuber producers regardless of the size or sophistication of their operations. This information must not only be generated, but translated into locally understandable terminology.

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Technology transfer is the extension of research findings to the ultimate users. Technology transfer of information on root and tuber production takes many forms, depending on the ability of the audience to comprehend. Farmers must be able to take our recommendations and convert them into improved production. Usually optimizing production means improved yields of superior quality. In many cases, acceptance of recommendations is motivated by its positive influence on profits.

Technology transfer is the means by which farmers learn about new varieties and new techniques of planting, fertilizing, controlling weeds, diseases and insects plus harvesting, handling, storing and marketing their crops. Technology transfer methods and techniques are often effectively utilized to teach optimum production practices.

Technology Transfer Techniques

Research farms or research facilities provide farmers living in the vicinity the advantage of being able to visit the researchers and observe their work. The nature of each work does not always lend itself to obvious interpretation by those who would best use it. While experimental plot work is essential to the development of sound scientific information; it can confuse the average farmer. Conditions under which experiments must be conducted may make a crop look very good or very bad depending on the nature of the research. If not properly explained by the project personnel, the average research work may appear to be irrelevant and exposure to it could be counterproductive. A farmer may question, for instance, why in some experiments, weeds, diseases and/or insects are allowed to thrive at the expense of the crop. On the other hand, a farmer may be frustrated by the appearance of yields and quality which he finds impossible to produce on his farm.

Visits by farmers and other interested citizens to experimental farms should be anticipated and encouraged. Organized, timely visits best suit the objectives of such exposure. Space and materials may be designated for demonstration purposes, especially if research concepts are not apparent in the established plots. Care should be taken to relate to the visitors (without talking down to them or otherwise insulting their intelligence) in terms they will comprehend. Signs, labels, illustrations, etc. can be used effectively.

Productive relationships between citizens and scientists should be fostered by encouraging meaningful dialogue between visitors and project leaders. Remember that research leads to new processes and techniques to help the farmer. Remember too that farmers' questions are often the seeds of additional research. This kind of cooperation is a tradition with its roots in the beginning of agricultural education, both in the classrooms and in the fields.

On-farm tests or demonstrations are effective in relating information and recommendations to farmers. Having plots in their own community means farmers don't need to travel far or expend a great deal of effort to see what research is doing for them. Testing and demonstrating under grower conditions lends credibility to research findings and recommendations. Certainly there is the risk of losing the plots for any number of reasons, but the benefits of local visibility and enhanced acceptability of recommendations offset this risk.

It is important that a cooperating grower be chosen who is an acknowledged leader in the community and whose involvement will foster the support of his neighbors. Local agricultural civil service employees (country agents) can judge best. Size of operation is a consideration. It may be a burden for a small farmer to be involved in plot work and he

may not be sophisticated enough to appreciate what you are trying to accomplish. A larger farmer may be enthusiastic and willing to cooperate, but unable to give the necessary attention to the plots. Generally a medium-sized farmer will be sophisticated enough to appreciate the importance of properly caring for plots on his farm. He will also be in a better position to personally see to it that plots are properly maintained.

Scientifically designed experiments can be effectively conducted as on-farm tests and can be another important source of research information. Replicated plots provide the opportunity for collection of sound data. However, it may be important to include an extra replicate on the outside edge of the plots for farmers in the community to observe. Encourage them to "scratch" in the soil for personal and valuable "hands-on" experience. Plots should be clearly labelled in such cases.

On-farm tests should be well-marked with appropriate signs (including logo of organization) along the road and plot-by-plot descriptive plaques. All signs should be brief and clear. If possible, give the cooperating farmer credit on the road sign. Plots should have buffer rows which clearly delineate them and leave no question as to where the plot ends and the grower's field begins.

At some appropriate time during the season (preferably near harvest) invite everyone in the community to visit the plots for a field day or tour. Two or more plots and/or locations may be visited at the same time. Be sure that the plots are well-maintained and effectively illustrate recommendations that local farmers should consider. The project leader(s) should be on hand to describe and discuss what the visitors are seeing. An informal growers' meetings could also be scheduled to be a part of the tour and plot visits. Such a meeting provides an excellent opportunity to reinforce a broad spectrum of recommendations.

Grower meetings are important and can take many forms, including local, regional, state or national. The larger, more sophisticated growers will participate in grower meetings any place and any time their work schedules permit. They have the resources and interest to go to state and national meetings (Wilson, 1979) and will often contribute as much as they will benefit. Smaller farmers may participate in regional or local meetings but many may require substantial motivation and encouragement to go.

Local meetings should be less formal than others in order for farmers to be comfortable and receptive. Any popular community gathering place is adequate if distractions are minimized. The facilities should be checked in advance for space and relative comfort with the option of adequate darkening for visual aid presentations.

The meeting should be brief, but professionally conducted and informative. The program should provide ample time for meaningful dialogue and discussion between farmers and "experts." Both will learn a great deal from each other if the proper environment is established and maintained. Avoid trying to give your audience everything in one session and never apologize for your preparedness or visuals. Keep the number of speakers to a minimum and avoid lengthy dissertations. Not all subject areas need to be covered in any one meeting. Farmers are not accustomed to sitting and listening and digesting vast amounts of information. Presenting large tables full of data serves no useful purpose so, stick to a few important numbers, preferably in simple graphical illustrations. All visual aids should be clear and easily interpreted.

Publication of information and recommendations is important and useful to root and tuber farmers. Scientific publications are important to our professional careers, but are meaningless to most farmers. They need information in uncomplicated forms that will require little interpretation. Production bulletins (Wilson et al., 1979; 1977) are excellent resource manuals for farmers, especially if the information is based on local studies or

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adapted for local conditions. These can be comprehensive and illustrated with photographs, graphs, and tables.

Leaflets and pamphlets are popular, especially if they are brief and concentrated on a limited subject area. For instance, one or two page (front and back of one page if possible) leaflets on root and tuber varieties, diseases, insects, weed control, etc. can adequately and briefly present pertinent information. The title should clearly indicate the contents of the paper. These publications are relatively inexpensive and make excellent handouts for grower meetings or field days. They can also be mailed to farmers in response to specific questions.

Extension and research professionals generate considerable amounts of useful data and information each year. Much of this can be, and is, published in referred journals, annual reports or other documents. Our clients, the farmers, do not need or want to know everything that has been learned or observed each year. They want to know what is important to them. Annual summary reports of extension and research findings and recommendations (Wilson, 1979; 1978) are very useful publications. Each professional working on a particular commodity should briefly summarize the important features of each project conducted the previous year. The desired theme is to present only what you would tell farmers personally if they asked you about a project. This information may be elaborated in other publications, but this summary report is aimed specifically at farmers.

Periodic newsletter (Hugnes, 1979) from Extension Specialists and researchers to local extension professionals can be useful to them in dealing with their farmers. Such information should be distributed frequently (monthly). It should be brief, concise and timely.

Conclusion

Getting root and tuber technology transferred to those who will use it is the "bottom line". The job is not really completed until farmers are aware of the latest developments and are attempting to incorporate them into their operations. If the research was worth doing its results are worth reporting to the ultimate beneficiaries. Every effort should be made to coordinate research and extension efforts toward the ultimate goal of helping farmers help themselves.

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