News and Reviews

A COMPUTER AID TO POTATO SEED PRODUCTION, STORAGE AND DISTRIBUTION IN DEVELOPING COUNTRIES

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Abstract

A major constraint to potato production in developing countries is the timely availability of good quality seed. The problem is frequently not a question of an awareness of good production practices, but rather the implementation of this expertise given limited resources, bureaucracy, lack of storage and transport facilities and the very small quantities of seed needed by many small farmers. These phases are often poorly appreciated by project managers, who do not fully understand the inter-relationships of the many factors involved. The development of a computer model of the production/storage/distribution phases has aided managers in Burundi, central Africa, to become aware of these important factors and also helped in planning long-term and seasonal production strategies. This paper outlines the essential elements of the model, which could be a useful planning and production tool in many other developing countries.

Introduction

Seed is often a major input cost for potato production in developing countries: ranging from 20% to 55% of total costs (4). Where subsistence farming predominates, as for example in Rwanda, it may be the only cost other than family labour (1). Author observations indicate that a similar situation pertains in neighbouring Burundi.

Van der Zaag and Horton (4) also note that developing countries appear able to produce small quantities of high-quality seed, but have

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difficulty distributing to farmers a large quantity of seed of reasonable quality. This suggests that field techniques are understood but, when larger quantities are involved, problems are encountered during the storage and distribution phases of production. These phases are often an important cost in seed production, requiring considerable capital investment.

Many project managers in developing countries tend to be field-production oriented and poorly understand the importance of the post-harvest phases and their inter-relationship with field production. If project managers became aware of these factors, it could make their task easier, improve seed quality and allow optimal use of limited resources.

The Problem

Vegetative propagation combined with the perishable nature of the seed tuber has meant that seed potato production has been traditionally the prerogative of official seed schemes or specialized seed growers. For reasons of disease control, seed farms of either category often have been isolated from ware-producing areas. Thus, vital logistical considerations in terms of storage and transport to ware growers may be entailed.

In developing countries logistical considerations assume greater importance if similar schemes are followed. Production is characterized by many small farms scattered over rugged terrain. There is commonly a lack of infrastructure: appropriate storage facilities, adequate transport and roads, etc. Farmers also only require very small seed lots. For example, in Burundi, central Africa, a major development project (Cultures Villageoises en Haute Altitude, CVHA) distributes only 20 kg of seed to any single farmer for any one planting. Distribution to as many as 15,000 farmers may be entailed. Timely distribution of seed in good physiological condition has proved a major logistical problem. Similar situations have been reported elsewhere: Peru (2) and Nepal (R. Rhoades, personal communication).

Seed distribution is dependent upon a range of factors extending beyond the storage/distribution phase (Table 1). A full understanding of the complex inter-relationships among all factors is essential if good quality seed is to be available. Changes in cultivars, quantities requested, areas of priority distribution, etc., entail constant changes in production patterns. In developing countries, these changes place great pressure upon project managers and staff, who may be involved with many crops and have other duties. Insufficient consideration may thus be given to this complex situation.

Project managers need an "aide memoire" to the main factors and their inter-relationships. A simple computer model of the production, storage and distribution phases could accomplish this. It would also allow managers to predict, at the planning stage, the likely outcome of any proposed production schedule. This paper describes the development in Burundi of a simple model capable of fulfilling these requirements. The model was