Proceedings:
International Symposium on
Prospects of Horticultural Industry in Pakistan
28th to 30th March, 2007
Institute of Horticultural Sciences, University of Agriculture, Faisalabad

CITRUS IMPROVEMENT AS A MODEL FOR HORTICULTURAL DEVELOPMENT IN PAKISTAN

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Abstract

Although Pakistan has a rich history of citrus production, there are always opportunities to improve an industry, particularly in light of changes in world production and consumer preferences. Worldwide orange production for processing has been limited by climate and diseases in the two principle production areas, Florida, USA and Sao Paulo, Brazil. China has become interested in becoming a source of orange juice for domestic and export markets. Currently there is an over abundance of seedless mandarins on the fresh fruit market in Europe and the US, but since local production and market potential may not reflect world conditions, the future of the fresh fruit market should be carefully analyzed. Production potential in a specific area such as Pakistan should be carefully evaluated from the perspective of climate, available land, soil quality, water abundance and quality for irrigation, prevalent and potential pests and diseases. For each of these potential constraints, an economic evaluation of cost-benefits for solving the problem should be made in order to appreciate the practicality of actually increasing production. Market potential should consider the cultivars which can be successfully grown in a region and the local, regional and world market potential. At the regional and world level, certain fruit quality, phytosanitary, and handling-transportation standards are required and the infrastructure to meet these requirements must be evaluated in terms of available expertise, training and costs for new necessary facilities and procedures. This process and how it applies to Pakistan will be discussed in detail. This same process can be undertaken for any potential opportunity to expand and/or modernize horticulture in Pakistan.

INTRODUCTION

Although Pakistan has a rich history of citrus production, there are always opportunities to improve an industry, particularly in light of changes in world production and consumer preferences. Worldwide orange production for processing has been limited by climate and diseases in the two principle production areas, Florida, USA and Sao Paulo, Brazil. China has become interested in becoming a source of orange juice for domestic and export markets. Currently there is an over abundance of seedless mandarins on the fresh fruit market in Europe and the US, but since local production and market potential may not reflect overall world conditions, the future of the fresh fruit market should be carefully analyzed since individual areas can have marketing

advantages. Production potential in a specific area such as Pakistan should be carefully evaluated from the perspective of climate, available land, soil quality, water abundance and quality for irrigation, prevalent and potential pests and diseases. For each of these potential constraints, an economic evaluation of cost-benefits for solving the problem should be made in order to appreciate the practicality of actually increasing production. Market potential should consider the cultivars which can be successfully grown in a region and the local, regional and world market potential. At the regional and world level, certain fruit quality, phytosanitary, and handling-transportation standards are required and the infrastructure to meet these requirements must be evaluated in terms of available expertise, training and costs for necessary facilities and procedures. This process and how it applies to Pakistan are discussed. This same process can be undertaken for any potential opportunity to expand and/or modernize a horticulture sector in Pakistan.

The Punjab of Pakistan produces 95% of the countries citrus and of this Kinnow is the major cultivar, 1.17 million tonnes and representing 80% of all citrus exports in 2004. Total citrus production was Rs. 1.24 million in 2004. Other citrus grown includes oranges, other mandarins, grapefruit, lemons, and limes in the more southern areas. Most production is in sustainable mixed plantings for local and city market production. Production for export is more organized, but apparently still relies on relatively small farm production

In order to increase or improve production in any agricultural sector, especially horticulture a process of evaluation of the selected crop is necessary. The first issue is the market potential. This should consider the kinds of markets, seasons that the crop can be harvested, how that fits into the current markets and what increased volume the markets might be able to absorb. Both established and potential new markets should be evaluated. What are the market requirements regarding quality, volume, timing?

The second part of an effective evaluation is to assess the production part of the equation. What is the potential for expanding and/or improving production to meet an opportunity to market more produce? What are the major constraints, such as climate, available land with suitable soils, water, knowledgeable and willing growers, pest and disease constraints?

Regarding markets, various opportunities are available and have distinct characteristics. Local markets may be fruit stands or trailers operated one day per week or expanded to daily. A step up in complexity is the permanent store in a small community selling fruits or vegetables with little preparation or offering second grade fruit. The larger city trade may be through the wholesale market or directly to retailers or retail chains. These markets usually require washed product, sorted for size and quality, maybe receiving full packinghouse treatment. The most complicated market level is export. There is a wide variety of expectations and requirements which vary depending on the market. Even in the US, the internal market differs from export to the EU or Japan, which have very high requirements, while Russia is an example of an easier to access market.

Characteristics of local markets include almost no preparation. This is usually rural marketing either at the farm, roadside or within a small community. There is little transportation cost and is mostly a small farmer opportunity. In some countries this is only acceptable for second grade fruit, while many use ‘field run’ produce. These markets have limited clientele only local competition with production area and are not suitable for large production. Prices are usually low, but profit may be acceptable.

City markets have a larger marketing potential and quality expectations may be moderate. However, transportation costs can be moderate to high depending on distance. Both wholesale markets and retail store buyers (possibly market chains) can be available. Usually no control of price by the seller occurs in wholesale markets, while moderate control may exist when dealing with buyers for retail outlets. On the other hand, wholesale markets have no continued supply expectations while buyers for retailers prefer sources that can provide quality produce over an extended period. In either case, pricing is more dependent on in-country supply.

Export markets on the other hand have greater quality expectations, but these still differ by market as do import rules. Competition depends on both local and import supply if the local quality compares to the imports. Quality expectations are very high in countries like Japan (maybe only 30 to 50% of harvested fruit will meet requirements). Both the EU and USA expect good external quality partially because of market expectations but also to protect internal production. Russia has been more lenient than other import markets, particularly for citrus external quality.

Import into developed countries usually comes with a large number of regulations that go beyond quality standards. Phytosanitary regulations are meant to protect the local industries from diseases and pests. At the same time, there are pesticide use regulations for chemicals that might be used to eliminate these pests and diseases. Of course these regulations are intended to protect consumers and are based on the Codex Alimentaria list and in many cases additional chemical use regulations exist. Knowledge of this information for the intended market is essential. In addition, container size may be regulated and in relation to all of the other regulations tracking of produce from farm to buyer may be required.

Competition in export markets is a key to whether successful entry is possible. Even in well developed markets there can be market windows or seasonal niches. When these exist it is still important to be able to provide an extended supply as a reliable source for buyers. Quality compared to the competition is essential, but offering a better price of only a slightly lower or equal quality may be an inroad to a given market. If production costs or delivery costs (transportation) are lower, importers may be interested.

Pakistan's situation for expansion of citrus production is reasonably promising. There is a good local and domestic market, but it appears that the production season is limited and at least in the northern Punjab, production of other citrus is not sufficient. There are reports of other citrus being produced, but they were not evident. Climate appears suitable for cultivars of citrus other than Kinnow. These would allow a longer season and could extend the ability to supply citrus to export buyers.

Currently, Pakistan is exporting only one cultivar which is seedy, but costs of production are low and average quality is high. However, the marketing period may be extended beyond the period of good quality? Because of this one cultivar, there is export experience and at least four or five packinghouses are doing export business. Of course all of this is from Kinnow production. The beginning of some cooperative effort was also evident in that at least one packinghouse was providing production services to growers in the form of fertilizers, pesticides and some production advice. It was not determined if any similar experience has occurred in a southern area where there might be more opportunity to grow more tropical cultivars.

In order to expand marketing, particular export, a wider array of cultivars to capture a larger market share should be grown, i.e. early and late seedless mandarins and oranges.

At the same time, this effort would supply in-country markets with more citrus over a longer period of the year, thus expanding horticulture and health of the population. Since most developed country markets expect seedless fruit, more seedless mandarin cultivars should be introduced for export. At the same time Kinnow should be tested for parthenocarpic tendencies to see if it will set without pollination and fertilization and thereby produce seedless fruit. Bloom time spray treatments of $CuSO_4$ to inhibit pollen growth and GA_3 to enhance parthenocarpic fruit set should be evaluated. These treatments provide some seedless fruit of Clementine cultivars in Spain when cross compatible cultivars are planted too close together.

As stated earlier, Kinnow may be marketed beyond the period of its best keeping quality which can lead to delivery problems in export markets. The best market window for top quality Kinnow should be examined in order to avoid any delivery problems when shipping to high quality requiring countries. While this would likely reduce the shipping season for Kinnow, other cultivars could still expand the overall market season and volume. Packinghouses were successfully storing Kinnow for later marketing also. Again the best fruit for storage, often mid-season, and the limits for safe storage need to be known.

In order to expand and improve production of citrus, an in-depth evaluation of climatic limitations of different regions of the Punjab and north and south of this region should be undertaken with examination of flower induction temperatures, available water and conditions for fruit maturation. Mandarins, oranges and lemons do better in cooler climates, while grapefruit and particularly limes need more tropical conditions. In all cases deep, well drained soils that are not too heavy are best for growing citrus. Enough easily obtained water should be available for irrigation.

While many farmers, mostly small holders, are successfully growing some citrus in a mixed crop, sustainable production situation, better information to minimize competition between the crops would increase the citrus production. Growers with more land may be more inclined to grow only citrus rather than mixed crops. It was evident that better rootstocks and production practices for heavy soils with phytophtora potential should be introduced. Most nursery tree production seen was in the field and tree condition indicated that well cared for, disease free citrus nursery plants should be used. All-in-all a coordinated effort to expand cultivars and production area is needed in order to increase citrus production in a profitable way. More information is need and field demonstrations should be available to show growers better adaptation of citrus to mixed and citrus only plantings depending on an individuals land holdings and preferences.

In the final analysis it is necessary to put production and marketing together in a coordinated effort that must include market analysis, research, an extension information system and grower-exporter cooperation. Research should include suitable cultivars, better rootstocks and production practices. Phytophtora resistance in rootstocks would help growers immediately as would irrigation management to irrigate the trees and the intercrop separately by establishing a furrow-dyke system that separates the crops.

In order to have a coordinated new cultivar production-marketing effort, certified disease-free citrus nursery trees must be produced in order to introducing new cultivars. The advantages of such a system must be made known to the growers through an effective extension information system.