Intellectual property rights and Pakistan's mango production

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INTELLECTUAL property rights, also include plant breeders' rights. If we accept breeder's rights, ten years from now, we will have to cut down all our mango orchards for fuel wood and timber. Paragraphs below describe the breeding programmes of mango the world over and how they are going to destroy our mango industry.

Pakistan produces 5.86 percent of World's mangoes, being the third largest producer with India as 9,500,000 tons, followed by Mexico and Pakistan as 890,000 and 766,000 tons respectively, out of the World's total production of 16,222,934 tons. All the present mango cultivars of the world are chance seedlings and selections were made on the basis of quality. It is only in Florida that during the past 50 years, efforts were made to recommended new mango varieties based on the combination of number of criteria namely; eating quality, attractive skin with eye appeal, marketable size, tree size, yield per tree, number of trees per acre, market price per unit weight and total returns per acre after deducting the cost of production. No such study has been done for variety recommendation in the South-Asia, where mango had organised.

In South-Asia mango selection was based on the eating quality and high sugar content. The profitability of best quality mangoes selected on this criteria is very low as compared to less acceptable ones even today. In terms of net returns per acre, Pakistan's best mango Chaunsa Summer Behisht, fetches half as much as Langra, one of the lower quality fruits in the Hyderabad Sindh area.

The breakthrough in mango hybridisation came to India some 25 years ago, when they identified self-unfruitful or self-sterile varieties and by crossing some of them, they produced new varieties, namely Ratna, Amarpali, Niranjan, Sunderdamagra, Alafazli and Malavia Bhog. The Indian variety Amarpali planted at 2.5 x 2.5 a metres is dwarf, regular and profuse bearing, producing 9 tons per acre in ninth year of planting. This is ten times the yield of most of the South-Asian cultivars, which produce less than one ton in the ninth year and three tons per acre in the twentieth year. India has produced another high yielding variety Malavia Bhog having height of 2.5 meters and capable of raising 1600 plants per acre. Its yield in the ninth year was 16 tons per acre. India has 330 desirable types for breeding programme. These are classified into: bearers,

producing more than one crop each year, bearing in clusters, dwarf type, resistant to malformation, resistant fruit fly infection, resistant to winds; prolific bearers, resistant to bacterial black spot, resistant to leaf hoppers and those having good keeping quality.

India has been slower in their breeding programme than Brazil, which produces 390,000 tons or about 50 per cent of Pakistan's production. Recently Brazil has produce ten hybrids of commercial importance. In the past few years India has also started hybrid programme on a large scale with a view of produce the best cultivars for international market.

Florida has successfully produced a number of good cultivars, which have found the prominent place in countries from Mexico to Argentina, Israel, South Africa and now Australia. Their research at present is aimed at producing disease resistant varieties, dwarfing root-stocks, immunity to anthracnose, bacterial black spot, stem-end rot and jelly seed and varieties adoptable to humid climate during fruit development period.

Australian entry

Australia a new starter has collected best mangoes from the world over at Nambour (Queensland) for breeding trials. They also have a large number of collection in Western Australia where the Sindhri variety of Sindh has also been imported under its original name Sindhura from Banglore (India). Australians are looking for varieties with fruit size between 300 - 700 grams, with at least 30 per cent of skin having red colour at maturity, short juvenile period of 2-3 years, fibreless fruit with no internal quality problems, free of turpentine flavours, resistant to anthracnose and bacterial black-spot, dwarf tree and heavy producer.

Israel is not far behind but rather quite ahead. Their cultivar breeding programme consists of 10,000 different seedlings originating from controlled crosses made by caging trees under nets and open pollination, wherein a tree of one variety is surrounded by a large block of only another variety to ensure cross-pollination with the desired variety only.They have been using DNA finger-print to mango for identification of various cultivars, identification of pollen donors, determination of genetic relatively, detection of genetic linkages between agriculturally important trades and significant decrease in the number of back-cross generations needed in gene interorgression.

Plant breeder rights

In 10,000 seedling mentioned above, 50 different cultivars have served as parents. The initial spacing is 1.5 x 4 meters. The seedling are evaluated over the

period of two to five years by grading of productivity, fruit colour, fruit taste, harvest season, fruit size and length of juvenile period. About 2,000 seedling are discarded each year and 2,000 sown every year as the replacements. The DNA finger print are aimed at plant-breeder rights, so that no one is able to use graft wood or seeds of their patented varieties for multiplication or breeding.

What are plant breeder rights and how far should Pakistan accept them? In our opinion any rights on genetic material can internationally be challenged and therefore a new word "Plant Breeder Rights" has been coined. We illustrate this with the case of peach (prunus-persica). It originated in south western China, where from it reached Europe around the beginning of Christian Era (Modern Calendar). The Spanish and the Portuguese from their respective countries took seeds to the new World. Some of the seeds germinated, flowered and fruited in the hot climate of Mexico, a climate comparable to that of Sindh, southern-Punjab and eastern Balochistan. US varieties were mostly from other parts of Europe. Breeders in universities of Florida and Texas crossed these European and Mexican varieties and produced superior cultivars, which can grow in the low latitudes of subtropics at low altitudes in Mexico and also from Karachi to Multan. Who has right on the genetic material? South Western China, Central Europe, Spain, Portugal, Mexico or USA?

Israel has evolved three apple varieties namely Anna, Dorsett, Golden, and Einshmer. All of 3 which can grow in Sindh and Southern Punjab. Material for breeding these cultivars was collected from Oman to Egypt. Middle Eastern varieties with European ones but can they claim rights on the genetic materials? So far they have not, but for future cultivars they would claim Breeders Rights.

American scientists from California, Oregon, and Washington States have been collecting the genetic material of grapes from northern hills of Pakistan and other countries over the past 8-10 years. University of California as well as USDA-ARS, Fresno, has produced a number of grapes, which have been patented. The patented material is available for sale anywhere in the World. Redglobe grape is one of such example under the licence for growing or multiplication of this variety one has to pay, royalty for each plant produced and sold. If the importer multiplies and sells Redglobe and he or she is responsible or payment of royalty for each plant produced by him or her or any body else who-so-ever multiplies them. The royalty is nominal at 5 cents per plant and amounts to the payment of about Rs 1.70 per plant per year but when there are 1000 plants per acre, it amounts to Rs 1,700 per acre per year. This is almost 10 times the after rate, and land revenue collected by the Government of Sindh each year per acre. This is what Plant Breeder's Rights mean. Imagine the day when 50 million acres of land

in Pakistan will grow all field and horticulture crops under Plant Breeders Rights and pay royalty of 8-10 billion of rupees a year.

GATT, WTO

Let us examine, what happens to our mango industry 10 to 15 years from now when under GATT WTO treaty, international borders will be opened to free trade without restrictions and protection of local industry. Amarpali with yield of nine tons per acre in the ninth year or Malavia Bhog with yield of 16 tons per acre in the ninth year their descendants will be producing more than 20 tons per acre, when our existing mature trees of 19-20 age will produce only three tons per acre. It is then when the countries having bred high yielding and better quality mangoes will be free to dump their products in our market. Due to high yield the prices will come down and they would be in a position to sell their mangoes at less than half the price of our own mangoes and yet make substantial profits.

Our mango production has cost-benefit ratio of 1:2, i.e. input cost is 50 per cent of the gross sales value and is at par with profit. At this cost to benefit ratio the farmer wont be able to sell his mangoes at price less than imported and will be compelled to cut down the trees for fuel and timber. This would be an out-come of plant-breeder rights, which essentially means accepting rights of breeder on the genetic material brought from any other country and denying the country of origin of germplasm any right on it. Although mono-embryonic mango germplasm originating from the South-Asia had reached Florida 80 years ago, and though hitherto we could use their off-springs selected in the developed countries, but after patent rights their future off-springs can only be used under the licence, in view of breeders rights. We believe every-one on the earth has the same right on the genetic material. As against this we have before us "The Roros Declaration" of March 1995 which in unambiguous words has declared, 'We call for rejection of all patents on any forms of life, in agriculture and horticulture, in animal genes and micro organisms".

Today in Pakistan our plans should be to import all superior mango cultivars from India, Brazil, Australia, Israel, South Africa, and Florida and multiply them, as we do not have capability to breed fast enough to be competitive with the countries, which have lead over us. The best we could do is to engage and encourage private parties, who have demonstrated capability to introduce' new fruit crops, to carry-out disposal. If we do not accept this warning we will see death of our mango industry.