

6. MAIZE PRODUCTION CONDITIONS IN PAKISTAN AND FUTURE PROBLEMS

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Maize was introduced in the Indo-Pakistan sub-continent in the 15th century by the European traders who came through land routes from the North West. This is evident from the fact that cultivation of maize is more common in the North Western parts of the sub-continent that now constitute West Pakistan. Very little maize is grown in East Pakistan. Perusal of maize cultivation in different administrative units of West Pakistan shows that its cultivation is more prevalent in the north western districts included in Peshawar Division. About half of the total area under maize in West Pakistan is sown in this division. Next in importance are Sargodha, Rawalpindi and Lahore divisions as can be seen from figures of area and production in different civil divisions of West Pakistan given in the table below—

Table Area and production of maize in different of civil divisions of West Pakistan.
(1967)

Division	Area sown (hectares)	Production (tons)
Peshawar	298,866	377,600
Rawalpindi	70,404	67,200
D.I. Khan	27,935	13,900
Sargodha	92,226	141,300
Lahore	56,842	54,600
Multan	48,542	80,500
Bahawalpur	20,647	29,800
Khairpur	2,550	1,800
Hyderabad	12,469	8,300
Quetta	5,587	3,500
Kalat	1,169	200
Karachi	—	—
West Pakistan	637,687	778,700

According to the data given in the table, maize is grown in West Pakistan over 0.6 million hectares annually yielding over 778 thousand tons of grain. Major maize growing districts in West Pakistan are Peshawar, Mardan and Hazara that command more than 44% of the total area under maize in West Pakistan. Maize is fairly important crop in Hazro valley in Campbellpur district and Murree hills area of Rawalpindi dis-

trict. Sialkot, Lyallpur and Shahpur are other important maize growing districts in West Pakistan.

Maize, although a foreign introduction, played a very important role in the agricultural economy of the Indo-Pakistan sub-continent specially the area that now constitutes West Pakistan. This area was once considered to be the grainary of India. Wheat produced in the former Punjab and Sind was supplied to the deficit areas within the sub-continent and also exported to England and other European countries through Karachi port that had no other importance but for the export of wheat from the north western parts of India. As a matter of fact the production of wheat in this part of the sub-continent was never in excess of the total requirements of the population but its consumption was fairly low because due to disparity in prices of wheat and maize, majority of the population in rural area used to eat maize for part of the year as it was cheaper and sold wheat in the market that could bring more money to the farmers. In this way wheat was in excess in the markets and was exported. This contention is borne out by the figures of consumption published in the report on marketing of wheat in former Punjab in 1940.

According to the report consumption of wheat in Urban areas at that time was 149-186 kgs per capita per annum while in the rural areas per capita annual consumption of wheat was hardly 93.3 kgs because people in the villages used to consume lot of coarse grains, i.e., maize in the Punjab, and Jowar (Sorghum) in Sind. Since more than 80% of the population lived in the rural areas, total consumption of wheat was very low. After the second world war, prices of wheat came under Government control. In order to keep down the prices of wheat heavy foreign imports were undertaken with the results that coarse grains started selling in the market at higher prices than wheat. This brought about a change in the dietary habits of the rural population. Obviously nobody would like to eat coarse grains and pay more than wheat. With increase in the consumption of wheat it became necessary for the Government to continue its import and thus the so called food problem was created.

As a result of artificial check on the prices of wheat use of coarse grain as human food was reduced considerably. Consequently area under summer season grain crops did not increase with increase in population. Farmers in the villages grow maize or other coarse grains during summer months not for their domestic consumption but to pay wages in kind to the village carpenters, blacksmiths and other persons who work for them; therefore, they plant only that much area under maize, as is sufficient to meet such sundry requirements. Lower production of summer season grain crops that previously used to carry the rural population through winter, resulted in general shortage of food grains in the country.

Grow More Food Campaigns

Realizing the importance of summer season grain crops in solving food problem in the country, several grow more food campaigns were organized before and after independence. In these campaigns main stress was laid on increasing area under summer season grain crops because it was in the summer season that there was sufficient irrigation water available in the canals and more area could be planted under grain crops. Several concessions like remission of water rates etc., were offered to induce the farmers to put larger acreage under grain crops in the season. Despite these concessions and coordinated efforts of all the nation building departments at the district level none of these schemes could produce tangible results. All the efforts and money spent on these campaign were considered as waste.

High Yielding Varieties Are Necessary

This goes without saying that no persuasion other than economic gain can induce the farmers to adopt any new practice. Summer season grain crops that include maize, pearly millets and sorghum yielded so low that it was not economical for the farmers to go in for their cultivation on irrigated lands in the plains where more profitable crops like cotton and sugarcane could be grown with advantage. In addition to low yields certain difficulties that are peculiar with the summer season grain crops like bird damage, post harvest problems etc., stood in the way of their large scale cultivation in the canal colonies. Obviously a farmer would not go in for a crop of maize that would require about one month's watch and ward against the birds and wild animals till the crop is matured and then about the same period for drying the cobs in the sun before shelling for an ultimate yield of less than a ton hectare. No summer season grain crop can become popular with the farmers unless its average is more than 3-4 tons per hectare to make it economical under the present price level of the farm commodities.

Out of all the summer season grain crops maize has the potentiality to give very high yields when grown under irrigated conditions with adequate supply of artificial fertilizer. New synthetic varieties and hybrids developed by the research workers in West Pakistan have shown remarkable yielding capacity. Yields as high as 14 tons of ear corn that amounts to about 10 tons of dry grains per hectare have been obtained from these varieties in semi-commercial trials.

Large scale production of synthetic and hybrid maize varieties was undertaken during the year 1967, throughout the maize growing districts in West Pakistan. At the end of the crop season a survey was conducted to ascertain the yields of maize obtained by the farmers who planted these new varieties through the Extension staff of the Agricultural Department. This information was collected from more than 2000 farmers from all over the country. It was revealed that an over all average yield of 3.5 tons per hectare was obtained by these farmers who planted synthetic and hybrid maize. The maximum yield recorded was 12 tons per hectare. However, a number of farmers still obtained as low yields as 0.8 tons per hectare from their maize crop. Obviously such low yields from the crop that has very high yield potential are due to the ignorance of the farmers about the technology involved in the production of maize.

There has been recently considerable improvement in the maize production in West Pakistan. At the time of independence the area now constituting West Pakistan was producing hardly 370 thousand tons of maize which rose upto 578 thousand tons in 1966-67. During 1967-68 maize production in West Pakistan jumped up to 778 thousand tons due to the wide spread use of artificial fertilizer and high yielding synthetic varieties that increased the national average yield from 942 to 1240 kgs per hectare. Sudden rise in the production of maize in West Pakistan is partially due to the fact that country faced temporary grain shortage during 1966 when almost all the available food grain was consumed as human food leaving practically nothing for use as seed which created an alarming situation for the Government who were considering the possibility of importing maize seed from the U.S.A.. Fortunately research scientists in West Pakistan came up with the technology to raise successfully an additional crop of maize during the spring season, the produce of which could be used immediately for planting the normal season crop that is sown in most parts of the country after 15th of July. There was enough foundation seed of J1, and other synthetic varieties available to plant about 4000 hectare in different Union Councils during the months of February and March. This crop was raised under direct supervision of the extension staff and matured success-

fully in the month of June yielding more than 20 thousand tons of seed. Since most of the farmers did not have their own seed of local varieties for planting, they had to use the improved seed which resulted not only in mass demonstration but also increased the country's production very considerably. At some places farmers succeeded in obtaining more than 10 tons of grain per hectare from the improved varieties by using better cultural practices and adopting proper pest control measures. High yield potential in maize aroused considerable interest among the farmers who are going to increase their acreage under maize from the next crops season.

Maize production received further impetus due to the introduction of high yielding varieties of wheat from Mexico. On account of high yield from these varieties farmers felt tempted to plant as much of their land under wheat as possible. West Pakistan has a very good canal irrigation system supplemented by series of tube-wells installed by Government agencies as well as private individuals. Consequently there is plenty of water available in the summer months. Obviously the farmers who plant wheat in the winter would not allow their fields to remain vacant during the entire summer season. Moreover, Mexican varieties of wheat do well West Pakistan conditions when planted rather late, i.e., after the end of November. This allows the farmers sufficient time to raise a good crop of maize during the summer season before planting wheat. Consequently area under maize is increasing rapidly as wheat—maize is becoming established as the standard rotation in West Pakistan. Since the farmers are now learning to grow more than one crop on the same land by using artificial fertilizer, there is no doubt that Pakistan will become a major maize producing country in the near future.

Problems

With the increase of acreage under maize, a number of problems will have to be faced by the farmers in West Pakistan. Some of these are mentioned below—

1. Marketing — There is no organized market for maize in West Pakistan because so far it has been consumed by the poorer section of the population right in the villages, leaving very small percentage to be taken to the town for marketing. Recently maize product industries have been established that can consume about 50,000 tons of maize in a year. These companies have set up their purchasing centres at different markets in the maize growing areas and have also built several maize cribs in the villages to buy corn on the cobs from the farmers. Where ever a crib is installed by a product company, the farmers in that village plant larger acreage under maize and sell their surplus production to the crib. In this way all the cribs built by the maize products industry were filled without any difficulty because the farmers consider it a great help if they would sell the produce of their maize crop immediately after harvesting without drying and shelling. Although the maize products industry is providing market for maize, their total requirements hardly exceed 5 percent of the country's production. It is, therefore, very important to develop feed industry in the country to consume maize that is surplus to the domestic needs of the farmers. It is also worth while to explore the possibilities of exporting maize so that regular market for maize is developed in the country.

2. Insect control — Maize crop in West Pakistan suffers heavy losses from the attack of maize borer (*Chilo partellus*). It takes heavy toll every year damaging more than 20% of the crop. The maize crop planted earlier than the end of July suffers more serious attack of maize borer than that planted later in the season. This leaves a very short growing season for maize, with the result that long duration, high yielding varieties cannot be planted by the farmers, which is one of the reasons for low yields being

obtained from the traditional varieties. Although granular insecticides have been successfully used to control the pest, supply of insecticides in sufficient quantities to all the farmers in the interior is highly problematic. It is, therefore, desirable that such varieties of maize are developed that can withstand the attack of the pest and at the same time possess desirable agronomic characters.

3. Improvement in nutritive value of maize grain — Since maize is used primarily as food for human beings as well as for livestock in West Pakistan, it is highly desirable that such varieties are developed and popularized that contain higher percentage of lysine and tryptophane. A good deal of educational work will be necessary before the farmers are prepared to accept high lysine maize varieties the grain of which is dull and un-attractive in appearance. Feed industry will have to come forward and offer a premium for high lysine maize. Unless good marketing facilities are provided, it may not be possible to persuade the farmers to plant maize varieties that are superior in protein qualities.

4. Quick drying maize — In the absence of artificial drying facilities, the farmers who plant large acreage of maize are facing considerable difficulty in handling the crop after harvest. It is, therefore, necessary to provide them with varieties that lose moisture immediately on maturity and can be readily shelled upon harvesting. Fortunately such varieties are available and can be used after testing their suitability with regard to yield and time of maturity.

5. Bird resistant varieties of maize — Birds are very troublesome in certain areas of West Pakistan and hence such varieties are necessary that have long and tight husk to save them from the ravages of birds like parrots and crows that are very common in these parts of the world.

6. Short duration varieties of maize — In many parts of West Pakistan where intensive farming is practised by the farmers, there is great need of very short duration varieties that take 70 to 75 days to mature. Moreover such varieties can also be planted late in the season by the farmers in such areas where the maize borer is a serious problem and it is not possible to plant any maize crop before the end of August. These varieties can mature in time for planting wheat even though sown as late as end of August.

7. Other problems — In addition to the problems mentioned above there is definite need for varieties that are resistant to heat and drought for such areas that are entirely or partially dependent upon rains. Research will have to be undertaken to evolve varieties resistant to leaf diseases like *Helminthosporium maydis* and *H. turcicum*, to save crop losses especially in the northern region where there are relatively more humid conditions that are conducive to the spread of these diseases.

More intensive research will have to be conducted to ascertain agronomic factors necessary to realize maximum yield from the new varieties that are being developed in West Pakistan. Arrangements will have to be made for the supply of fertilizer and pesticide in adequate quantities to the farmers to help them in maximizing yield from their maize crop. Fortunately the Government of Pakistan is alive to these needs and is making all out efforts to ensure the supplies of various inputs needed for profitable agriculture, but the country's resources are not enough to meet the entire demand of the farmers. It is, however, hoped that the Government will arrange to obtain necessary funds from International loans that are now becoming available to Pakistan in increasing amounts due to the rapid progress made by the country in recent years and all the necessary inputs for better farming will be made available to cultivators.