



Study of Rice, condition of growth and Methods of Rice Cultivation

¹Priyanka Verma, ²Dr. Krishan Pal

¹Research Scholar, Mewar University, Chhitorgarh

²Assistant Professor , Department of Biosciences, SRC Muzaffarnagar UP

Introduction : Rice is the most important food crop of India covering about one-fourth of the total cropped area and providing food to about half of the Indian population.

This is the staple food of the people living in the eastern and the southern parts of the country, particularly in the areas having over 150 cm annual rainfall. There are about 10,000 varieties of rice in

the world out of which about 4,000 are grown in India Rice is one of the most important cereal of the world and also of india. India is the largest rice growing country in the world, cultivating in about 44.5million hectare area which is about 36percent of the world rice acreage. In india the crops being grown under a very wide range of ecological conditions. On the one extreme there are deep water rice crops. Assam & Bengal grow rice in 4.5m-6.5m deep water, whereas, on the other extreme the rice is grown upland with only 62.5cm-75.0cm of rainfall. The soil suitable for rice crops vary from sandy loam to heavy clay with varying pH value.

Since a large portion of maize crops are grown for purposes other than human consumption, rice is the most important grain with regard to human nutrition and calorific intake, proving more than one fifth of the calories consumed worldwide by the human species.

ISSN : 2454-308X





Rice is life for thousands of millions of people. In Asia alone, more than 2,000 million people obtain 60 to 70 per cent of their calories from rice and its products. Recognising the importance of this crop, the United Nations General Assembly declared 2004 as the “International Year of Rice” (IYR).



The theme of IYR—“Rice is life” reflects the importance of rice as a primary food source, and is drawn from an understanding that rice-based systems are essential for food security, poverty alleviation and improved livelihood.

varieties were of various kind such as -

After the establishment of the Central Rice Research Institute (CRRI) at Cuttak in 1946 by the Govt. of India, rice research and training received an added impetus. There had been a systematic screening of exotic types from the genetic stocks. Besides, for the purpose of direct introduction in the country, many Chinese, Japanese, Taiwanese and Russian types were also tested. The Chinese types, which were first, prior to 1947, tested in Kashmir Valley, found fairly successful and the Japanese and Russian types were found unsuitable under Indian conditions due to poor yield, unacceptable grain qualities and susceptibility to blast.

Inter-racial hybridization programme





between japonicas and indicas was initiated during 1950-54. The Food and Agriculture Organization of the United Nations with a view of improving production of cereal on an international basis after the end of World-War II, launched a collaborative project japonica X indica hybridization in South-East Asian countries. The object of these project was to transfer the high yielding capacity and response to use higher dose of fertilizers into local indica varieties from japonica varieties. Indica varieties were already well adapted to the local conditions and had tolerance to diseases and pests of the region. A parallel project of japonica X indica hybridization was also started by ICAR with the same objectives. These projects could achieve very limited success. Only four varieties, viz. - Malinja and Mashuri in Malaysia, ADT-27 in Tamil Nadu, India and Circna in Australia were released from more than 700 hybrid combinations.

The Central Rice Research Institute, Cuttack also started another project in 1960 with a view to evolve high yielding fertilizer responsive varieties with japonica in 11 states. In this project remarkable success was achieved in the development of japonica X indica hybrids.

The International Rice Research Institute was established in the Philippines in 1960 and this institute helped in evolving dwarf high yielding varieties with the concept of improving the plant type in indica rices based on the use of a gene from semi-dwarf Chinese varieties.

These high yielding varieties were highlighted during the International Rice Year in 1966 by ICAR through national demonstration trials. This was the beginning of moving towards self-sufficiency in rice production. Further, the ICAR launched the All-India Co-ordinated Rice Improvement Project (AICRIP) in 1965 that helped in co-ordination of interdisciplinary and



inter-institutional research results on the country basis for improving the production, productivity and profitability of rice in India.

Cultivation of Rice : There are three seasons of rice growing viz. autumn, winter and summer. Autumn Rice is Pre-Kharif rice sown during May to August; and harvested in September-October. Autumn rice crop accounts for only 7-8% of total rice grown. Winter Rice is the Kharif rice in India, sown in June-July and harvested in November-December. This accounts for 84% rice cultivation in India. Summer rice is also called Rabi rice sown from November to February and harvesting time is March to June. This accounts for 8-9% of total rice cultivated in India. Thus, rice is predominantly a Kharif crop in India, grown in both irrigated areas as well as rain-fed areas with high rainfall. It requires hot and humid conditions for growing with 24° C mean temperature and 150-300 cm rainfall. The crop is predominantly labor oriented and is not much suitable for heavy farm mechanization. With regard to the soil, rice is grown both in uplands and lowlands. On this basis, there are several methods of rice growing such as Dry or Semi-dry upland cultivation; Broadcasting the seed; Sowing the seed behind the plough or drilling; Wet or lowland cultivation; Transplanting in puddled fields; Broadcasting sprouted seeds in puddled fields etc.

Conditions of Growth:

Rice is grown under varying conditions in India from 8° to 25° N latitude and from sea level to about 2,500 metre altitude. It is a tropical plant and requires high heat and high humidity for its successful growth.



The temperature should be fairly high at mean monthly of 24°C. It should be 20°- 22°C at the time of sowing, 23°-25°C during growth and 25°-30°C at the harvesting time. The average annual rainfall required by rice is 150 cm.

It is the dominant crop in areas of over 200 cm annual rainfall and is still an important crop in areas of 100-200 cm rainfall. The 100 cm isohyet forms the limit of rice in rainfed areas. In areas receiving less than 100 cm annual rainfall, rice can be grown with the help of irrigation, as is done in Punjab, Haryana and western U.P. About 40 per cent of rice crop in India is raised under irrigation.

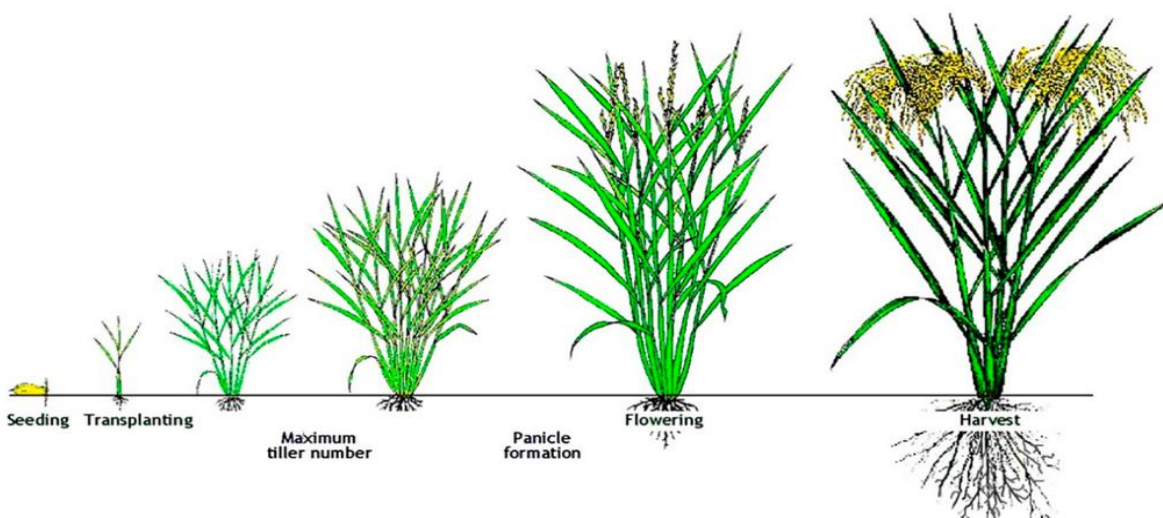
However, it is the temporal distribution of rainfall, rather than the total amount of annual rainfall which is more decisive. The rainfall should be fairly distributed throughout the year and no month should have less than 12 cm of rainfall. Lesser amount of rainfall is required as the harvesting time approaches.

The fields must be flooded under 10-12 cm deep water at the time of sowing and during early stages of growth. Therefore, the fields must be level and have low mud walls to retain water. This peculiar requirement of rice makes it primarily a crop of plain areas. Rice grown in well watered lowland plain areas is called wet or lowland rice.

In hilly areas, the hill slopes are cut into terraces for the cultivation of rice. Such a cultivation in which the hill slopes are cut into terraces is called terraced cultivation. The supply of water to the hill terraces is not as much as in the plain areas and the rice grown in hilly areas is called dry or upland rice.



Rice can be grown on a variety of soils including silts, loams and gravels and can tolerate acidic as well as alkaline soils. However, deep fertile clayey or loamy soils which can be easily puddled into mud and develop cracks on drying are considered ideal for raising this crop.



Such soil requirements make it dominantly a crop of river valleys, flood plains, deltas and coastal plains and a dominant crop there. High-level loams and lighter soils can be used for quick maturing varieties of rice. Black lava soil is also useful for rice cultivation.

Rice culture is not much suited to mechanisation and is called 'hoe-culture'. Most of the work in preparing the seed-bed, in broadcasting seeds, or in transplantation of plants from nurseries to the fields, in harvesting and in winnowing operations is done by human hand. Thus it is a labour intensive cultivation and requires large supply of cheap labour for its successful cultivation.

It is, therefore, primarily grown in areas of high population density which provide abundant labour and at the same time, offer ready market for its consumption. In most rice producing



states, labour is locally available but in Punjab and Haryana, rice cultivation mainly depends upon the migrant labourers from Bihar and eastern U.P.

Methods of Rice Cultivation:

Following methods of rice cultivation are practised in India.

1. Broadcasting method: Seeds are sown broadcast by hand. This method is practised in those areas which are comparatively dry and less fertile and do not have much labour to work in the fields. It is the easiest method requiring minimum input but its yields are also minimum.

2. Drilling method: Ploughing of land and sowing of seeds is done by two persons. This method is mostly confined to peninsular India.

3. Transplantation method: This method is practised in areas of fertile soil, abundant rainfall and plentiful supply of labour.

To begin with, seeds are sown in nursery and seedlings are prepared. After 4-5 weeks the seedlings are uprooted and planted in the field which has already been prepared for the purpose. The entire process is done by hand. It is, therefore, a very difficult method and requires heavy inputs. But at the same time it gives some of the highest yields.

4. Japanese method: This method includes the use of high yielding varieties of seeds, sowing the seeds in a raised nursery-bed and transplanting the seedlings in rows so as to make weeding and fertilizing easy. It also involves the use of a heavy dose of fertilizers so that very high yields are obtained. The Japanese method of rice cultivation has been successfully adopted in the main rice producing regions of India.

References :

AICRIP, (1991). *Annual Progress Report, 1990-91*. All India Coordinated Rice



Improvement Programme, Agronomy Chapter, pp. 171-180.

Akram, M.; Cheema, A.A.; Awn, M.A. and Maqbool, A.(1985). Effect of planting date and fertilizer level on grain yield and protein content of rice. *Pak. J. Agric. Res.*, **6** (3) : 165-167.

Anonymous (2005). *The Hindu Survey of Indian Agriculture*. pp. 41-46.

Anonymous (2006). *The Hindu Survey of Indian Agriculture*. pp. 50-54.

AOAC (1980). Official methods of analysis, 14th edition, Association of Official Analytical Chemists, Washington, D.C.

Asraf, M.; Mahmood, S.; Musif, M. and Yousif, M. (1989). Relationship between transplanting time and grain of Basmati-385. *IRRN*, **14** (1) : 8.

Baird, C.; Miller, J. Hill, E. and Stacy, R.R. (1985). Plant population effects on growth and yield in water seeded rice. *Agron. J.*, **83** : 291-297.

Balasubramaniyan, P. and Palaniappan, S.P. (1991a). Effect of high density population and fertilizer rate on growth and yield of low land rice. *Indian J. Agron.*, **36** (1) : 10-13.

Balasubramaniyan, P. and Palaniappan, S.P. (1991b). Effect of population density, fertilizer levels and time of application on rice. *Indian J. Agron.*, **36**(2): 218-221.