



FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

Adaptation and distribution of crops

Crop adaptation

Adaptation is defined as the ability of a crop to respond positively to changes in agricultural conditions.

It is the capacity of genotypes to adjust themselves in a specific or particular environmental condition, so as to reach a certain level of phenotypic expression.

Types of adaptation

There are 4 types of adaptation.

1. Specific genotypic adaptation

It is the close adaptation of a genotype to a limited environment. For the production of rice in a deep water area; a variety's capacity for rapid inter-node elongation is an essential feature of its specific adaptation.

2. General genotypic adaptation

It refers to the capacity of a genotype to produce a wide range of phenotypes compatible with a range of environments. Semi-dwarf varieties of wheat and rice which can be grown over a wide range of environmental conditions are the examples of this type of adaptation (adaptability).

3. Specific population adaptation

It refers to the capacity of a heterogenous population to adapt to specific environment. A composite or a varietal mixture giving stable production is an example of this category. Here the competition is between the components of variety or mixture rather than adaptation of components themselves.

4. General population adaptation

It is the capacity of heterogenous populations to adapt to a variety of environments. Synthetic varieties of forage crops are example of this category. This property of adaptation is specific to an individual genotype or a group of genotypes and is termed as homeostasis.

Other types

1. Morphological adaptation

Growth habit, stalk length, radial symmetry of rhizome etc.

2. Physiological adaptation

Resistance to parasites, greater ability to compete for nutrients or to stand desiccation.

Distribution and production of crops in India

Agriculture plays a vital role in the Indian economy. Agriculture is the backbone of our country. It includes farming of crops, animal husbandry, pisciculture, agro-forestry, etc. Nearly 60 % of Indian population primarily depends on agriculture.

Crop seasons in India

1. Kharif
2. Rabi
3. Zaid

1. Kharif crops

- Sown in June-July when rains first begin.
- Harvested in September – October
- Requires lot of water and hot weather to grow.
- Example- rice, jowar, bajra, maize, cotton, groundnut, jute, sugarcane, turmeric, pulses (urd dal) etc.

2. Rabi crops

- Sown in October- November
- Harvested in April- May
- Requires warm climate for germination of seeds and maturation and cold climate for the growth.
- Example- wheat, oat, gram, pea, barley, potato, tomato, onion, oil seeds (like rapeseed, sunflower, sesame, mustard, etc.)

3. Zaid crops

- Grown between March- June
- Early maturing crops
- Example- cucumber, bitter gourd, pumpkin, watermelon, muskmelon, moong dal, etc.

Categories of crops in India

1. Food crops (wheat, maize, rice, millets and pulses, etc.)
2. Cash crops (sugarcane, tobacco, cotton, jute and oilseeds, etc.)
3. Plantation crops (coffee, coconut, tea and rubber, etc.)
4. Horticulture crops (fruits and vegetables).

Crop distribution

Distribution of different field crops all over the world depends upon several factors such as: climate, growing season, altitude, rainfall, wind, soil, slope, and other factors. However, the distribution of the main field crops can be presented as follows (according to FAO statistic, 2009):

1- Wheat:

China occupied the first rank in the world production of wheat followed by India, Russian Federation, United states, France, Canada and Pakistan .

2- Barley:

Russian Federation produced the highest world production of barley followed by France, then Germany, Ukraine, Australia, United States and finally Morocco .

3- Rice:

Regarding world rice production, China occupied the first rank followed by India, Indonesia, Bangladesh, Vietnam, Myanmar and Thailand .

4- 4- Maize:

United States of America occupied the first rank of the world production of maize followed by China, Brazil, Indonesia, India, Argentina and South Africa .

5- Cotton:

China occupied the first rank for world cotton area followed by India, Pakistan, Uzbekistan, Brazil, Turkey and Australia .

6- Sugar cane:

The highest world production of sugar cane was recorded for Brazil followed by India, china, Thailand, Pakistan, Mexico and Colombia .

7- Soybean:

The Unites States occupied the first rank for world soybean production followed by Brazil, Argentina, China, India, Paraguay and Canada .