



## **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 melon, 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 .