Hello myself Deepti Naik from Government College of Arts, Science and Commerce Quepem Goa.

So today's module is for Bachelor of Science students, third year in the subject of botany. Semester six, course code is BOC 108 and course title is cytogenetics and plant breeding. So the title of the unit is method of crop improvement and the module name is selection methods for vegetatively propagated plants.

In this model, we are going to study the selection methods and its types, characteristics of vegetatively propagated plants, clonal selection method, procedure for clonal selection method, then merits and demerits of clonal selection method.

Now learning outcomes, once we finish with this module, you will be able to explain the selection method and their types, then list out the characteristics of vegetatively propagated crops and understands the clonal selection method, described the procedure of clonal selection method and compare the merits and demerits of clonal selection method.
Introduction, what is selection method? Selection is most primitive and the simplest method used for the crop improvement so it can be defined as preservation of certain individual plants of desirable characteristics or we can say It is sorting out of the plants having desired characters.

Now types of selection methods. Selection methods are mainly divided into two types, that is natural selection and the artificial selection. Under artificial selection, they are again divided into four types, that is mass selection, Progeny selection, Pure line selection and clonal selection. And we are going to study the

clonal selection as our topic indicates, it is only for vegetatively propagated plants.

So what are the vegetatively propagated plants? So here All the members of a clone are identical or there is no variation within a clone. Many crops shows reduced flowering and seed set. All the members of a clone are heterozygous. Clones crops are either polyploids or have polyploid species. The phenotypic variation within a clone is due to environment. Crops are inter-specific hybrids.

What is clonal selection method? Clonal selection is the artificial method of selection for vegetatively propagated crops. If seeds are either lacking or are of low viability, then vegetative parts are used for their propagation then it is called clone. A clone is a group of plants produced by vegetative propagation of a single plant are known as a clone.

then Breeding of Clonal crops has following phases. First Creation of genetic variation

and second Selection of best genotype from the variable population to produce a superior clone or variety and procedure of selection used for such crop is know as Clonal selection. So crops such as bananas, potato, sugarcane, onion, garlic, turnip, grapes, ginger, colocasia are propagated through their vegetative part.

now what are the characteristics of clone? They are Identical genotype means individual belongs to single clone are identical in genotype. They lack of genetic variation but they are showing phenotypic variation present with in clone due to environment. Then Immortality here clone can be maintained indefinitely through asexual reproduction. Severe inbreeding depression: Clones are heretrozygous and shows sever loss due to inbreeding.

Now Clonal degeneration, What do you mean by Clonal degeneration?

A cloner degeneration is the loss in vigour and productivity of clone with time is known as Clonal degeneration. Clonal degeneration may result from: mutation, viral disease,and bacterial diseases. As we know mutation is the alteration of genes so, some mutation occurs at high frequency and becomes problem over a long period of time. Then Viral diseases: diseases easily transmit and spread with time. Last Bacterial diseases: easily spread with time and results into sever infections in the plants. These three are the responsible for clonal degeneration.

Next procedure for clonal selection, So this procedure is followed for seven year. First year we have to from a mixed variable population, few hundred to few thousand desirable plant are selected and rigid selection can be done for simply inherited characters with high heritability. Then Plant with obvious weakness are eliminated.This is done in the first year, then second year. The Clones from the selected plants grown separately and desirable clones selected.

In third year Preliminary yield trials with standard checks are done. So here the selection for quality, disease resistance etc is done. Disease nurseries may be planted. Few outstanding clone selected. From fourth-sixth year multi-location yield trials with standard checks is done where best clone identified for release as a new variety. And in the seventh year The best clone release as a new variety and seed multiplication for distribution begins.

What are the merits of clonal selection? It is useful in conserving heterosis for several generation. It Avoids inbreeding depression. It Can be combined with hybridization. Helps in Maintaing purity of clones. Useful in isolating best genotype from mixed populations.

Now demerits of clonal selection. It is only applicable to vegetative propagated crops. It does not create new variation. Varieties developed by clonal selection are highly prone to new diseases.
The progress of clonal selection is limited to the isolation of best genotypes already present in the population.

Achievements, after Cloner selection method was followed, there are several varieties of clonal crops have been developed such as Kufri Red and kufri safed in potato. Co 541, CoS510, Co1148, Co1158 etc. in Sugarcane. After bud Selection for fruit trees e.g.- Ko.11, Ko.22 in Neelum mango. Bombay green, Pride monthan and high gate in banana. Yuvraj Blood Red in Sweet orange etc.

So summary today we have seen selection methods, under this selection methods and their types, then characteristics of vegetatively propagated plants, What is clonal selection method then? What is the procedure which is followed for clonal selection? What are the merits and demerits of clonal selection methods?
These are my references.
Thank you.