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GPB-321

Crop Improvement – II (*Rabi*)

2(1+1)

Theory

Centers of origin, distribution of species, wild relatives in different cereals; pulses; oilseeds; fodder crops and cash crops; vegetable and horticultural crops; Plant genetic resources, its utilization and conservation; Floral biology, study of genetics of qualitative and quantitative characters; Important concepts of breeding self pollinated, cross pollinated and vegetatively propagated crops; Major breeding objectives and procedures including conventional and modern innovative approaches for development of hybrids and varieties for yield, adaptability, stability, abiotic and biotic stress tolerance and quality (physical, chemical, nutritional); Seed production technology in self pollinated, cross pollinated and vegetatively propagated crops.

Cereals:	Wheat, oats and barley
Pulses:	Chickpea, lentil and field pea
Oilseeds:	Rapeseed mustard and sunflower
Fodder:	Berseem, oats and lucerne
Cash crop:	Sugarcane

Seed spices and medicinal plants: Cumin, coriander, fenugreek, fennel and isabgol

Vegetables & Hort. crops: Potato

Hybrid seed production technology of rabi crops. Ideotype concept and climate resilient crop varieties for future.

Practical

Emasculation and hybridization techniques in different crop species namely Wheat, Oat, Barley, Chickpea, Lentil, Field pea, Rapeseed Mustard, Sunflower, Potato, Berseem. Sugarcane; Handling of germplasm and segregating populations by different methods like pedigree, bulk and single seed decent methods; Study of field techniques for seed production and hybrid seeds production in *Rabi* crops; Estimation of heterosis, inbreeding depression and heritability; Layout of field experiments; Study of quality characters, study of donor parents for different characters; Visit to seed production plots; Visit to AICRP plots of different field crops.

Lecture Schedule: Theory

S.N.	Topic	No. of lectures
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1	Crop improvement aspects in wheat as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc.	1
2	Crop improvement aspects in oat as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc.	1
3	Crop improvement aspects in barley as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc.	1
4	Crop improvement aspects in chickpea as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc.	1
5	Crop improvement aspects in lentil as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc.	1
6	Crop improvement aspects in field pea as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc.	1
7	Crop improvement aspects in rapeseed mustard as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc.	1
8	Crop improvement aspects in rapeseed mustard as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc & hybrid seed production	1
9	Crop improvement aspects in sunflower as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc.	1
10	Crop improvement aspects in berseem as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc & hybrid seed production	1
11	Crop improvement aspects in lucerne as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc & hybrid seed production	1
12	Crop improvement aspects in sugarcane as mentioned in the syllabus such as Centers of origin, distribution of species Floral biology breeding objectives and procedures etc.	1
13	Modern innovative approaches for development of hybrids and varieties for yield, adaptability, stability, abiotic and biotic stress tolerance and quality (physical, chemical, nutritional)	1
14	Seed production technology in self pollinated, cross pollinated and vegetatively propagated crops	1
15	Ideotype concept	1
16	Climate resilient crop varieties for future	1

Lecture Schedule: Practical

S.N.	Topic	No. of lectures
1	Emasculation and hybridization techniques in wheat, oats, barley	1
2	Emasculation and hybridization techniques in chickpea, lentil, field pea	1
3	Emasculation and hybridization techniques in rapeseed mustard	1
4	Emasculation and hybridization techniques in sunflower, potato	1
5	Emasculation and hybridization techniques in berseem, sugarcane	1
6	Maintenance breeding of different rabi crops	1
7	Handling of germplasm and segregating populations by different methods like pedigree, bulk and single seed decent methods	1
8	Study of field techniques for seed production and hybrid seeds	1
	production in <i>rabi</i> crops	
9	Estimation of heterosis, inbreeding depression and heritability	1
10	Layout of field experiments	1
11	Study of quality characters	1
12	Donor parents for different characters	1
13	Visit to seed production plots	2
14	Visit to AICRP plots of different field crops	2

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