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**GPB-222**

**Commercial Plant Breeding**

**3(1+2)\***

**Theory**

Types of crops and modes of plant reproduction. Line development and maintenance breeding in self and cross pollinated crops (A/B/R and two line system) for development of hybrids and seed production. Genetic purity test of commercial hybrids. Advances in hybrid seed production of maize, rice, sorghum, pearl millet, castor, cotton, pigeon pea, Brassica etc. Quality seed production of vegetable crops under open and protected environment. Alternative strategies for the development of the line and cultivars: haploid inducer, tissue culture techniques and biotechnological tools. IPR issues in commercial plant breeding: DUS testing and registration of varieties under PPV & FR Act. Variety testing, release and notification systems in India. Principles and techniques of seed production, types of seeds, quality testing in self and cross pollinated crops. **Practical**

Floral biology in self and cross pollinated species, selfing and crossing techniques. Techniques of seed production in self and cross pollinated crops using A/B/R and two line system. Learning techniques in hybrid seed production using male-sterility in field crops. Understanding the difficulties in hybrid seed production, Tools and techniques for optimizing hybrid seed production. Concept of rouging in seed production plot. Hybrid seed production techniques in sorghum, pearl millet, maize, rice, rapeseed-mustard, castor, pigeon pea, cotton and vegetable crops. Sampling and analytical procedures for purity testing and detection of spurious seed. Seed drying and storage structure in quality seed management. Screening techniques during seed processing viz., grading and packaging. Visit to public private seed production and processing plants. **Lecture Schedule: Theory**

S.N.	Topic	No. of lectures
1	Types of crops and modes of plant reproduction	1
2	Line development and maintenance breeding in self and cross pollinated crops (A/B/R and two line system) for development of hybrids and seed production	1
3	Genetic purity test of commercial hybrids	1
4	Advances in hybrid seed production of maize, rice, sorghum, pearl millet	1
5	Advances in hybrid seed production of castor, sunflower	1
6	Advances in hybrid seed production of cotton, pigeon pea, brassica	1
7	Quality seed production of vegetable crops under open and protected environment	1

8	Alternative strategies for the development of the line and cultivars: haploid inducer	1
9	Tissue culture techniques	1
10	Biotechnological tools	1
11	IPR issues in commercial plant breeding	1
12	DUS testing and registration of varieties under PPV & FR Act	1
13	Variety testing, release and notification systems in India	1
14	Principles and techniques of seed production	1
15	Types of seeds	1
16	Quality testing in self and cross pollinated crops	1

### Lecture Schedule: Practical

S.N.	Topic	No. of lectures
1	Floral biology in self pollinated species	1
2	Floral biology in cross pollinated species	1
3	Selfing and crossing techniques	1
4	Selfing and crossing techniques	1
5	Techniques of seed production in self and cross pollinated crops using A/B/R and two line system	1
6	Learning techniques in hybrid seed production using male-sterility in field crops	1
7	Understanding the difficulties in hybrid seed production	1
8	Tools and techniques for optimizing hybrid seed production	1
9	Concept of line its multiplication and purification in hybrid seed production	1
10	Role of pollinators in hybrid seed production	1
11	Hybrid seed production techniques in sorghum	1
12	Hybrid seed production techniques in pearl millet	1
13	Hybrid seed production techniques in maize	1
14	Hybrid seed production techniques in rice	1
15	Hybrid seed production techniques in rapeseed-mustard	1
16	Hybrid seed production techniques in sunflower	1
17	Hybrid seed production techniques in castor	1
18	Hybrid seed production techniques in pigeon pea	1
19	Hybrid seed production techniques in cotton	1
20	Hybrid seed production techniques in vegetable crops	1
21	Sampling and analytical procedures for purity testing and detection of spurious seed	1
22	Seed drying	1
23	Seed storage structure in quality seed management	1
24	Screening techniques during seed processing viz., grading and packaging	1
25	Visit to public private seed production units	4

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