OBJECTIVES

COURSE NO. AGRO-246

COURSE TITLE: CROP PRODUCTION TECHNOLOGY II (RABI CROPS)

CROP- WHEAT

1. **Triticum aestivum** is called as common bread wheat/soft wheat/sarbati wheat
2. **Triticum durum** is Marconi/hard/bansi wheat
3. **Triticum dicoccum** is emmer wheat.
4. Important critical growth stage of wheat is CRI. Crown root initiation(18-21 DAS)
5. Origin of wheat is south west asia
6. Gluten provides structural frame work to bakery products
7. Bread making quality in wheat depends upon- Gluten content.
8. Membranous fringe like structure present at junction of leaf blade and leaf sheath is- Ligule
9. Horn like appandages present at the base of leaf blade is- Auricle.
10. Wheat contain 11- 14 % proteins
11. Spikelets are arranged systematically on central zigzag axis is- Rachis
12. Timely sown irrigated wheat is sown at 1st Nov. to 15th Nov.
13. Late sown irrigated wheat is sown at 15th Nov. to 15th Dec.
14. Rainfed wheat is sown at 2nd forthnight of October i.e. 15-30th October.
15. Timely sown wheat crop sown at 22.5 cm spacing
16. Seed rate of timely sown wheat crop is 100 kg/ha
17. Seed rate of late sown wheat crop is 120-150 Kg/ha
18. Seed rate of rainfed wheat is 80 Kg/ha
19. Mexican dwarf wheat varieties have short coleoptiles length, hence sown at shallow depth. If sown deep- unable to come out of soil surface, affect crop stand, germination and less number of tillers
20. Mexican dwarf varieties of wheat are sown at less than 5 cm depth
21. Total water requirement of wheat is 40 ha cm
22. RDF of timely sown wheat is 120:60:40-60 Kg NPK/ha

23. *Phalaris minor* (canary grass),Wild Oat(*Avena fatua*) are important weeds observed in wheat crop. (mimicry weeds in wheat)
24. Isoproturon post emergence herbicide recommended to control wheat from wheat plot
25. Phule satvik- variety of wheat crop specially recommended for biscuit preparation
26. Phule satvik, Phule samadhan, Phule Nevtrawati are varieties of wheat released by MPKV, Rahuri
    Give reasons
27. Mexican dwarf wheat varieities are sown to a shallow depth
28. It is necessary to irrigate wheat in its crown root initiation stage
29. Inflorescence of wheat is ear/head, botanically it is Spike

CROP- RABI SORGHUM

30. Sorghum is known as great millet/ camel of dessert/camel crop due to its drought resistance
31. Due to lager seed size among millets, sorghum is known as great millet
32. 300 mesh fine sulphur @ 4 gm/kg of seeds for the control of grain smut & loose smut disease of sorghum
33. Seed rate of sorghum variety is 10-12 kg/ha, while seed rate of hybrid is 8-10 kg/ha
34. Striga is partial/semi root parasitic weed found in sorghum crop
35. Phule Suchitra, Phule Chitra,Phule rewati, Phule Wasudha, Phule uttara, Phule Madhur,Phule Panchami, Phule Rohini—sorghum varieties recommended for rabi cultivation
36. Phule uttara, Phule Madhur – varieties of sorghum preferred for hurda purpose
37. Phule Panchami- variety of sorghum- preferred for pop corn
38. Phule Rohini- variety of sorghum – preferred for papad preparation

39. Hydrocynic acid(HCN) is maximum, when sorghum is **at 35-40 DAS**

40. Due to presence of maximum hydrocynic acid(HCN) in young sorghum plant, it is not fed to animals in young stage.

41. Botanical name of Barley is *Hordeum vulgare*

42. Protein content of barley is 8-10%

43. Origin of barley is Abyssinia & south east asia (China, Tibet & Nepal)

44. Based on number of rows of grain Hordeum vulgare is six row barley

45. Hordeum distichon & hordeum irregulare two row barley & irregular barley

46. Barley is salt tolerant crop

47. Sowing time of timely sown barley is Oct 15- Nov 15

48. Sowing time of Rainfed barley is 2nd Forth night of Oct.

49. Sowing time of Irrigated barley is 1st Forth night of Nov. to 1st Forth night Of Dec

50. Seed rate of timely sown irrigated barley : 75-80 kg/ha

51. Seed rate of irrigated late sown barley: 100-120 kg/ha

52. Seed rate of Rainfed barley: 100kg/ha

53. Seed rate of barley for Saline soil: 100kg/ha

54. Irrigated timely sown barley RDF is : 80:50:50 Kg NPK/ha

55. Rainfed barley RDF is: 50:30:30 Kg NPK/ha

56. Late sown irrigated barley, RDF is 40:30:20 Kg NPK/ha

57. Origin of maize is Central America/ Mexico

58. Maize is called Queen of cereals –because it has very high yield potential than other cereals

59. Maize provides huge quantities of green fodder for cattle, therefore maize is called as king of fodder.

60. *Zea mays saccharata* is Sweet corn

61. Maize is monoecious plant

62. Male inflorescence of maize is called as tassel, stage is tasseling

63. RDF for grain maize is 120:60:40-60 kg NPK/ha.
64. Seed rate of fodder maize is 75 kg/ha
65. Phule Maharshi, Rajarshi is stem borer resistant variety of maize
66. Phule Madhu is variety of sweet corn.
67. African Tall is popular variety of maize crop

CROP-GRAM

68. Origin of chick pea is south-west Asia
69. Chick pea contain, 22% protein, 90-95%malic acid and 5-10% oxalic acid
70. Stem of chick pea is covered with granular hairs are- Trichomes
71. Desi/Brown Gram is Cicer arietinum
72. Kabuli/White Gram is Cicer kabulium
73. Chick pea is sown at 8-10cm depth to escape wilt disease
74. Seed rate of chick pea is 60-100 Kg/ha
75. No irrigation is given at flowering stage in gram to avoid premature flower drop.
76. Total water requirement of chick pea is- 25-30 ha cm
77. Nipping in chick pea, means removal of apical or terminal bud or tip from the main shoot. Nipping carried out 30-35DAS (initiation of branching).
78. Phule Vikram-- 1st variety of chick pea recommended for mechanical/ machine harvesting,
79. Phule Vishwaraj (Phule G-15109) – wilt resistant variety of chick pea
80. Phule Bhiwara, Phule Nira and Phule Kusum- are the new varieties of safflower
81. Virat, Vihar are kabuli varieties of gram
    Give reason
82. Seed rate of chick pea varies with the varieities??- due to difference in test wt. the seed rate of chick pea varies
83. Pulses are generally not top dressed??- they can fix atm. Nitrogen by themselves

84. Gram is considered to be a fertility restorative crop??- it enrich soil through symbiotic nitrogen fixation from atmosphere and maintain the fertility of soil

CROP- PEA

85. Garden Pea is *Pisum sativum var. hortense* - Used as table pea
86. Field Pea is *Pisum sativum var. arvense* -Used as pulse,forage & green manure crop
87. Seed rate of pea is 60-80 kg/ha
88. Total water requirement of pea is 30 ha cm
89. Phule priya is variety of pea

CROP- LENTIL

90. Botanical name of lentil is lens esculenta / lens culinaris
91. Lentil is used as green maturing crop in Kashmir valleys for paddy cultivation
92. Seed rate of lentil is 15-20 kg/ha
93. T-36 is variety of lentil

CROP- FRENCH BEAN

94. Phule Rajma,Phule suyash- are the new variety of French bean
95. Phaseolus vulgaris –is botanical name of French bean
96. Germination of French bean- is hypogeal
97. Origin of French bean is- South America

Crop- Safflower

98. Carthamus tictorius is- botanical name of safflower
99. Safflower belongs to family compositae
100. Safflower contain 25-32% oil
101. Safflower oil cake contains 40-50 %proteins

102. Safflower oil contains more polyunsaturated fatty acids i.e. linoleic acid(78%), it is good for heart patient as it reduces blood cholesterol level
103. For early or late sowing of safflower there may be attack of aphids
104. Topping in safflower- at the age of 30 -35 DAS the tops of the plants are removed, to encourage the profuse branching and greater production of flower and seed
Give reason
105. Safflower+ sorghum intercropping is uneconomical??-safflower competes with the main crop for soil moisture, as critical growth stages of both the crops are coinciding, it result in terminal moisture stress and declined yield.
106. Early or late sowing in safflower is not advised??-there may be attack of aphids
107. Harvesting of safflower should be done in morning hrs???- in morning, there is dew formation due to this plant and spines are not sharp, they become flexible, to avoid difficulty in harvesting by the spines

CROP-SUNFLOWER

108. Botanical name of sunflower is Helianthus annus
109. Sunflower belongs to compositae family
110. Sunflower contain 45-50% oil, and oilcake contains 40-44% proteins
111. Sunflower contain 64% linoleic acid- which reduces cholesterol level, thus good for heart patient
112. Sunflower originated from Mexico
113. Seed rate of sunflower for variety- 7-8 kg/ha, hybrids- 5-6 kg/ha
114. RDF of sunflower is- for irrigated- 60:30:30 kg NPK/ha, and for rainfed- 50:25:25 kg NPK/ha

115. Hand pollination is followed in sunflower
116. Phule Bhaskar, Phule Raviraj are the varieties of sunflower
117. Crop-Rapeseed and mustard
118. Botanical name of mustard is Brassica juncea
119. Family of rapeseed and mustard is Cruciferae
120. Mustard originated from China and Rape seed from India, Afganisthan
121. Botanical name of Yellow sarson is Brassica compestris vr. sarson
122. Botanical name of Brown sarson is Brassica compestris Vr. Dichotoma
123. Botanical name of Gobhi sarson is Brassica napus
124. Botanical name of Toria is Brassica compestris vr. toria
125. Botanical name of Taramira is Euruca sativa
126. Mustard Contain- 37-49% oil
127. Mustard Fruit is siliqua
128. Varuna, sita, pusa bold, prakash- varieties of mustard
129. Seed rate of mustard is 5 kg/ga

Crop- Linseed

130. Botanical name of linseed is *Linum usitatissimum*
131. Linseed belongs to Family- Linaceae
132. **Origin-** of small seeded linseed is south west asia (India, Afghanistan,Turkey
133. **Origin-** of bold seeded linseed is Mediterranean region (Egypt,Algeria,Spain,Italy,Greece)
134. Linseed is important oilseed & fibre crop
135. Linseed contain 33-47% oil
136. Hira is variety of linseed
137. Malshiras-10,solapur-36, sheetal are the varieties of linseed
138. Gaurav, Jeevan,Nagarkot are dual(oil& fibre) purpose varieties of linseed
139. Fruit of linseed is capsule/seedball
140. Linamarin- that compound makes linseed oil as non edible

141. Fibre of linseed is known as Flax
142. Seed rate of linseed is 20-30kg/ha
143. Process of fibre extraction in linseed is retting

CROP- SUGARCANE

144. *Saccharum officinarum* is noble cane, originated from New Guinea
145. *Saccharum sinense*(Chinese cane) is botanical name of sugarcane, originated from North east India
146. *Saccharum barberi*(Indian cane) is botanical name of sugarcane, originated from North east India
147. Sugarcane Breeding Institute, **Coimbtore (SBI)**
148. Indian Institute of sugarcane research, **Lucknow (IISR)**
149. Indian sugar institute, **Kanpur(ISI)**
150. Sett roots of sugarcane are function for limited period
151. Shoot roots of sugarcane are permanent roots
152. Immediately above each node 2/3 translucent dot i.e root primordia- give rise to sett root in sugarcane
153. Inflorescence of sugarcane is open panicle called as **Arrow**
154. Upper 1/3 rd portion is used for- planting which contain- high nitrogenous substance & glucose, germinate fast, than lower region cane as it contain more amount of sucrose
155. Spring planting of sugarcane is known as Eksali :feb.-March, March best time for planting,crop matures in 12 months
156. Autumn planting of sugarcane is done in Sept. to oct., Maharashtra- 15th Sept. to 15th oct. Crop matures in 13- 15months, Called pre-seasonal planting
157. Adsali: 15th jul to 15th Aug. Planting done commonly in Maharashtra
158. For planting one eye bud setts, require, 30,000setts/ha
159. For planting 2 eye bud setts require - 25, 000 setts /ha

160. For planting 3 eye bud setts require - 25,000 setts /ha
161. RDF for adsali sugarcane is 400:170:170 KgNPK/ha
162. RDF for preseasonal sugarcane is **340:170:170 kg NPK/ha**
163. RDF for suru sugarcane is **250: 115: 115 kg NPK/ha**
164. Total water requirement of adsali sugarcane is 340-350 ha cm
165. Total water requirement of pre seasonal sugarcane is300-325 ha cm
166. Total water requirement of suru sugarcane is250-275 ha cm
167. Total water requirement of ratoon sugarcane is 225-250 ha cm
168. Earthing up in sugarcane is done to prevent the crop against lodging due to heavy winds & to keep the crop field open for better aeration,
169. Propping in sugarcane is done by tying the canes together using the dry leaves & bottom green leaves.
170. Removal of dried leaves from lower parts of the sugarcane plant is called detrashing
171. Brix reading at the time of harvesting of sugarcane should be 19 to 24^0
172. The planting of sugarcane by trench method- to reduce crop lodging
173. Hot water treatment of sugarcane setts is done- to control seed born diseases
174. Brix measures total soluble solids(TSS)
175. Formative stage of sugarcane is most critical stage for irrigation
176. Brix reading in field is measured through- hand refractometer
177. Saccharum robustum- wild species of sugarcane

CROP- SUGARBEET

178. Botanical name of Sugarbeet is *Beta vulgaris*
179. Sugar beet belongs to family Chenopodiaceae
180. Sugarbeet is of

181. Varieties of sugarbeet are Maribo Marcopoly, Maribo Magnapoly, Maribo Resitapoly, Kawe megapoly, Kawe gigapoly, Tribel, Ramonskava-06
182. Seed rate of sugar beet is 8-10 kg/ha
183. Sugarbeet contain 15-16% suagr in it
184. 40 % world sugar is prepared from sugarbeet
185. Franz carl Achard is recognized as Father of Sugarbeet Industry
186. 15^0C temp. required for germination of sugarbeet seeds.

CROP-POTATO

187. Botanical name of potato is *Solanum tuberosum*
188. Potato belongs to family Solanaceae
189. Origin of potato is South America(Peru)
190. Potato is known as poor man's friend
191. Potato is rich source of starch
192. *Solanum andigenum*, *Solanum tuberosum* are commercially cultivated species of potato
193. Potato is an enlarged underground stem produced on the end of stolon & not on roots.
194. To break dormancy of potato, tubers are treated with 1% thiourea + 1ppm gibberellic acid
195. Seed rate of potato, for whole tubers 20-25 q/ha (early crop), Cut tubers 15-20 q/ha
196. RDF of potato is100-120 Kg: 60-80 Kg: 100-120 Kg NPK/ha
197. Total water requirement of potato is 50-60 ha cm
198. CPRI- Central Potato Research Institute, Shimla(H.P.)
199. Lenticels- respiratory organ of potato
200. Arial stem of potato is Haulms
201. TPS(True Potato Seed) associated with potato
202. Optimum weight of tuber for sowing is 30-50 gm

203. To control black scurf and common scab diseases in potato seed tubers should be treated with boric acid
204. Ideal tuber diameter for planting2.5-3 cm
205. Earthing up in potato generally done 30DAS
206. Underground stem of potato is known as stolon
207. About 150 gm TPS is required to produce sufficient seedlings for one hactare

CROP-BERSEEM (EGYPTIAN CLOVER)

208. Botanical Name of berseem is*Trifolium alexandrium*
209. Berseem belongs to family Leguminoseae
210. Berseem originated from Egypt
211. Berseem contain 20 % crude protein
212. If berseem is fed alone to the cattle, they may suffer from **bloating.** Therefore, it must be mixed with dry fodder & then fed to the cattle.
213. Seeds of berseem are treated with *Rhizobium trifoli* @ 250 gm/10kg seeds.
214. Seed rate of berseem is 30kg/ha
215. Vardan, Meskavi are varieties of berseem

Crop- Lucerne (Alfalfa)

216. Botanical Name of lucerne is *Medicago sativa*
217. Family of Lucerne is Leguminaceae
218. Lucerne is originated from southwest Asia
219. Lucerne is a king of legume forages
220. Seeds of lucerne are treated with *Rhizobium melilotti* culture @ 250 gm/10 kg of seeds, to increase nitrogen fixation
221. Seed rate of Lucerne is 25kg/ha

222. Lucerne and berseem sown at mid. Oct. to mid Nov.
223. sirsa 9 , anand 2, sirsa 8 ,NDRI-selection no. 1, Rambler, chetak- are the varieties of lucerne

Crop- Oat

224. Botanical name of oat is Avena sativa
225. Kent is common variety of oat
226. Seed rate of oat is 100 kg/ha
227. Origin of oat is Asia minor
228. Phule Harita is variety of oat crop
229. For fodder purpose, oat is harvested at 50% flowering (50-60 DAS)

Crop- Lemon grass

230. Botanical name of lemon grass is *Cymbopogan flexuosus*
231. Lemon grass is originated from India (Kerala)
232. Active constituent present in lemongrass is Citral
233. Chief constituent of the oil is Citral, which is used in the manufacture of **Vitamin- A** tablets
234. Lemongrass oil is thus used as a main substitute for **'Cod liver oil'**
235. *East Indian lemon grass: Cymbopogan flexuosus,* It is indigenous to Kerala. Its oil is known as Cochin oil.
236. Lemon grass is propagated by both seeds and vegetative means through slips.
237. First harvesting of lemon grass is done in 90-100 days (3 months) under Kerala conditions.
238. Oil from lemon grass is extracted by steam distillation.
239. Lemon grass at the age 52 days, contain 71% Citral
240. Lemon grass at the age 85days, contain 84% Citral

241. Lemon grass at the age 129 days, contain 76 % Citral
242. NIMA,CKP 25,RRL 16, Praman (Clone 29), Pragati (LS48), Sugandhi (OD 19) are the varieties of lemon grass

CROP- CITRONELLA GRASS

243. Botanical Name of citronella is *Cymbopogon winterianus*
244. Centre of Origin of citronella is Sri Lanka
245. MANDAKINI, MANJUSHA, MANJIRI, CIMAP Bio-13, Java-2, Jorhat-2 are the varieties of citronella

CROP-MENTHA

246. Botanical Name of menthe is Mentha arvensis
247. Mentha belongs to family Laminaceae
248. Centre of Origin of mentha is Mediterranean regions
249. 4 to 5 quintals of stolons of mentha are required for planting of one hectare of land.

CROP- TOBACCO

250. Botanical name of Tobacco is *Nicotiana sp.*
251. Tobacco belongs to family Solanaceae
252. Origin of tobacco Mexico & Central America
253. Nicotiana tabacum(Deshi tobacco)= 0.5-5.5% nicotine- used for smoking and chewing purpose
254. Nicotiana rustica(Vilayati/calcuttia tobacco)=3.5-8 % nicotine,- used for hookah,chewing and snuff
255. Central Tobacco Research Institute, Rajahmundry A.P.
256. Sodic soils not suitable- plant absorb chloride ions- result in poor burning quality of leaves
257. Tobacco leaves contain malic & citric aci

258. Sand-drown(typical king of chlorosis) disease in tobacco due to Mg deficiency
259. Nicotin is produced mainly in roots- carried through stem to leaves
260. Seed rate of tobacco is 2- 3kg seeds/ha
261. In nursery tobacco is sown at - 2nd forthnight of August
262. Transplanting age of tobacco is 4-5 leaves stage
263. Transplanting age in tabacum-7-9 weeks
264. Transplanting age in rustica- 5-6 weeks
265. Topping- removal of flower heads or with few upper leaves- to improve the size, body and quality of leaves
266. **Orobanche cernua is** complete root parasite of tobacco
267. Desuckering in tobacco after topping, removal of axillary buds/lateralbranches/suckers- to divert energy & nutrients to leaves
268. Desuckering not practiced in wrapper type of tobacco
269. Use of coconut oil 2%- suppress emergence of suckers in cheroot tobacco
270. Priming(Harvesting method)- Removal of matured leaves, used in cigarette & wrapper tobacco
271. Stalk cut method(harvesting method)- used in Hookah, Bidi, cigar, cheroot & chewing tobacco
272. Curing is drying process, moisture of leaves- removed to impart- required colour, texture and aroma
273. Sudden rise in temp., when leaves are wet,- develops- bluish black discoloration called- **Scalding.**
274. Flue cured Virginia (FCV) quality of tobacco is used in the manufacturing of cigarettes
275. Area required for nursery of tobacco for sowing in one hectare area- is1/100th of hectare
276. Topping-desuckering-priming- is correct chronological sequence of practices in tobacco
277. Fire curing is followed in chewing tobacco

278. Natu tobacco is mainly grown in the state of Andhra Pradesh
279. Golden leaf of India- is Tobacco
280. Damping off is the most severe disease occurring in tobacco nursery
281. Burning quality of tobacco leaves is influenced by Chlorine