MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMIMATION
B.Sc. (Agril.) Agro.235 (New)

7

SECTION "A" 2012 - 2013

Q. 1 Give the information on the following points about the cultivation of greengram :-

i. Economic importance ii. Improved varieties
iii. Seed and sowing iv. Harvesting , threshing and yield

i. **Economic important :-** Greengram content about 25 per cent protein of high quality. It is consumed in so many ways as whole grains as well as dal. It is a good source of riboflavin and thiamine. Sprouted seed of greengram synthesized ascorbic acid (Vitamin C). Greengram is also used for green manuring and being a leguminous crop , it fixes 30 to 40 kg N ha^{-1}.Being a short duration crop it is well suited for many intensive crop rotation and as a intercrops. It is also used for cattle feed.

ii. **Improved varieties :-** Kopargaon ,Jalgaon-781 ,TAP-7, S-8 , Phule-M-2, Pusa Vaishakhi, TARM-18,AKM-8803, PKVM-8802, TARM-2,AKM-9910 ,AKM-9911 (PKV Greengold) , PKV AKM-4

iii. **Seed and sowing:-** A seed rate of 12 -15 kg ha^{-1} .However, 20 kg ha^{-1} is optimum for an irrigated crop with closer spacing. In relay cropping system 25 – 30 kg ha^{-1} seed is required. Seed treatment with Thiram @ 3 g ka^{-1} seed before sowing. For nitrogen fixation seed treatment with Rhizobium @ 25 kg^{-1} seed.

A row spacing of 30 cm with 10 cm between plants in the row is optimum .For irrigated condition 30 x 5 cm for drilling method, for relay cropping the seed are sown in the line between the rows of the standing crop by broadcasting methods. In case of spreading types 45 cm between rows and 10 cm within the plant is adequate. The plant population of 3 lakhs plants ha^{-1} seems to be optimum.

iv. **Harvesting , threshing and yield :-**The crop should be harvested at physiological maturity. Shattering is a great problem in pulses. Hence , picking should be done as soon as the pods are mature. Threshing should be completed in 2-3 pickings. Harvesting is done by by uprooting or by cutting plant above the ground levels with sickle. pods after complete drying are threshed by beating with stick or under the feet of bullocks.

A good crop of greengram 12-15 q ha^{-1} grains.

Q. 2 Explain in details the cultivation of groundnut on the following points:-

i. Soil and Climate ii. Seed and sowing
iii. Intercultural operation iv. Harvesting and yield

i. **Soil and climate :-**Groundnut thrives best on well drained, sandy, sandy loam light, large and forible soil with sufficient calcium and moderate organic manures. Light soil helps in easy penetration of pegs, their development and harvesting of pods. Clay or heavy soil are not suitable as they interference in pegs penetration, development and harvesting of pods becomes difficult. Groundnut grows well on soils having pH 6.0 to 6.5.

Groundnut is a tropical crop. It requires a long and warm growing season. The crop grows successfully in the area receiving a minimum of 500 mm and a maximum of 1200 mm rainfall. The optimum temperature for vegetative growth is between 27-30°C Depending on the cultivar

reproductive growth is maximum at 24-27°C. growth rate of pods is maximum between 30-34°C.During ripening period groundnut required a month of warm and dry weather.

ii **Seed and Sowing** :-Seed requirement of varies with seed size and row spacing. In bunch type a spacing of 30 x 10 cm (3.3 lakh ha^{-1}) appears to be ideal for *kharif*. The seed requirement is 120 kg ha^{-1}. A spacing of 22.5 x 10 cm (4.44 lakh ha^{-1}) is optimum during rabi and summer season.

In case of spreading type, the most common spacing is 30 x 15 cm require ring a seed rate of 100 kg ha^{-1} to obtain a plant population of 2.2 lakh ha^{-1}.Bold seeded variety requires an additional seed rate of 20 kg ha^{-1}.

Groundnut is mostly sown under rainfed conditions with a bullock drawn seed drill or by the dibbling methods. Improved techniques broad and furrow method, paired row , crisscross pattern.

Pods should be shelled by hand one week before the sowing. Pods shelled long before sowing are liable to suffer from loss of viability and damage during storage . Seed should be inoculated with appropriate Rhizobium culture if the crop is sown in new field.

- **Pre-monsoon** :-Where irrigation facility are available , sowing before on set of monsoon with 1-2 irrigation gives better yield. The sowing is donc 20th June.
- **Kharif** :- The crop is grown as rainfed and sowing is done around 20th June.
- **Rabi**:- Groundnut cropping is limited to areas where winter is not severe and temperature do not go below 15 ° C The crop is usually sown after rice under irrigation. Sowing is done from October to December. Preferably in October last fortnight in Maharashtra.
- **Summer**:-The crop is largely confined to south Indian states. Sowing is done from second fortnight of December to first week of February.

iii. **Intercultural operation**:-The critical period of crop weed competition reported to be between 28-45 DAS. Weeds cause considerable reduction in the yield to the extent of 20-40 per cent. based on nature of weed infestation in the field. One or two hand hoeing and weeding should be done depending upon the soil type. First hoeing should be done 3 weeks after sowing and the second 3 weeks thereafter before commencement of flowering. Soil should not be disturbed when pegging starts. The major weed associated with groundnut crop are *Cynodon dactylon , Euphorbia sp., Tridex procumbens* etc..

Earthing up is a special type of operation carried out in this crop. The earthing up should be done by tying string with the tines of the hoe. Earthing up promotes easy penetration of pegs in the soil and provide more area to spread.

iv. **Harvesting and yield**:-Bunch type varieties are harvested between 90-110 days, semi-spreading between 110-135 days and spreading type between 140-145 days after sowing. Irrigation should be stopped 8-10 days before harvest. The important symptoms of maturity are:-

1. Yellowing of leaves.
2. Dropping of leaves.
3. Hardening and toughness of pods.
4. Dark tannin discoloration inside the shell.
5. Unwrinkled kernels and coloration of testa.

The bunch type and semi-spreading types are generally harvested by uprooting either by hand, bullock drawn blade harrows or by tractor drawn diggers. Spreading types are

harvested by digging out the plants by khurpi or spade or bullock drawn harrows. Stripping of pods is done manually or by comb type hand stripper or pedal operated stripper.

Yield:- 15-20 q of pods from bunch type and 25-30 q ha^{-1} from spreading varieties can be obtained.

Q. 3 Prepare a leaflet of soybean cultivation on following points:-

i. Land preparation ii. Nutrient management

iii. Improved varieties iv. Harvesting ,threshing and yield

i. Land preparation :-Soybean requires fine seed bed with least clods. One deep ploughing with mould board plough followed by two harrowing are enough to obtain good seed bed. For better seedling establishment there should be sufficient moisture at the time of sowing.

ii. Nutrient management:- Nutrient requirement of the crop vary with climate , cultivars , yield potential , cropping system and management practices. For obtaining good yield of soybean 15 -20 t of FYM or compost per hectare should be applied to soil before last harrowing. Being a leguminous crop it utilizes atmospheric nitrogen fixation. Application of 30 kg N as a starter dose is sufficient to fulfill N requirement of the crop in the initial stage in soil which are poor in organic matter. Phosphorus requirement of the crop is relatively higher than other crop. The demand of the phosphorus is more during pod formation to seed development. The crop should be fertilized with 70-80 kg P_2O_5 ha^{-1} . Phosphorus application stimulates nodulation and bacteria becomes more mobile.All the fertilizer should be applied at the time of sowing . Or As per recommended dose of fertilizers.

iii. Improved varieties :- Monetta, MACS-13 , MACS-58 ,MACS-124 , PKV-1, PK472, JS-80-21 , JS-93-05 ,JS-335, TAMS-38, TAMS-98-21, TAMS-98-21, Arti(MAUS-1), Pooja (MAUS-2),Prasad (MAUS-32),

iv. Harvesting , threshing and yield:- Soybean matures in 90 to 120 days depends upon the variety. Yellowing of leaves, dropping of leaves and drying of pods are the symptoms of the maturity. Harvesting is done by uprooting the plants or by cutting the plants with sickle. Then it is sundried on threshing floor. Thrashing is done either by beating with stick or by mechanical thresher. The grain are well dried in sun upto 10-12 moisture per cent.

A good crop of soybean yields 20-25 q ha^{-1}.

Q. 4 Elaborate method of sowing and harvesting of (any two)

i. Dinanath grass ii. Para grass

iii. Cluster bean iv. Hybrid Napier

i. Dinanath grass

Method of sowing:-The seeds are thin, light and papery and are mixed with moist soil before sowing. The sowing depth should not be more than 1 cm. the seed which lie on surface of moist soil are easy to germinate. Rising of seedlings in nursery and transplanting in the field is also done.

Harvesting:- Under single cut management ,harvesting is done about 3 to 3 ½ months from sowing to mid flowering. When sowing is done in June, the first cut can be taken after about 80 days and subsequently one or two cuts at an interval of 50 to 60 days. To encourage better germination clipping should be done 5 to 6 cm above the ground levels. In North India, sowing is done from the last week of June to mid August and only one or two cuts are taken.

ii. **Para grass**

Method of sowing:- Stem cutting or rooted slips 15 to 30 cm in length having three joints are used for planting. Setts are fixed in a standing manner in the soil for easy and quick establishment. In order to save time and labor, planting materials are scattered in the field and ploughed cross wise during monsoon seasons.

Seeds can also be used for direct sowing or seedling are raised in the nursery and transplanted in the main field. But due to poor seed setting this method is not generally adopted. To encourage fresh growth after 3 to 4 years, a light cross disking is done to renovate the old pasture by cutting the woody and fibrous stems. Burning of stubbles after the cold season is also done for this purpose.

Harvesting: - The first cut may be taken after 75 to 90 days from planting. When grass attains a height of about 60 to 75 cm . Subsequent cuts are taken at an interval of 4 to 6 weeks. In North India, grass grows vigorously from June to October and provide 4 to 5 cutting . However, in humid and mild climate of south about 10 cutting are possible.

iii. **Cluster bean**

Method of sowing:-The seeds are either broadcast or mixed with *deshi* plough or harrow. In dry farming area the seeds are sown in open furrow to facilitate quicker germination as there is better retention of moisture in the furrows.

Harvesting :- Guar is ready for harvest from flowering to pod initiation stage in about 70 to 80 DAS. plants become woody and fibrous resulting into loss of digestible nutrients and palatability if harvesting is delayed.

iv. **Hybrid Napier**

Method of sowing:- The grass does not produce viable seeds hence it is prorogated through stem cutting or rooted slips .

Three budded sets may be inserted into the soil in a slanting manner at 45° angle to the ground. Two buds should remain inside the soil and one above ground.

Furrows are opened with a ridger or country plough and three budded sets are placed end to end in the furrow like sugarcane. Then field should be irrigated if moisture is inadequate for sprouting.

Tillers along with roots are separated from clods. Each slip may consist one or two tillers of 10 – 12 cm height. along with roots. these rooted slips are inserted into the soil by digging hole with khurpi. This is best method for summer seasons..

Harvesting :-Younger crop contains higher amounts of oxalates which deplets calcium from the body of the animals. The first cut is taken after 9 to 10 weeks. Subsequent cuts can be done taken after 4 to 6 weeks or when grass attains a height of 1.5 mt. In north India ,5 cuts can be taken upto the end of November and in south India 7 to 10 cuts are possible.

Q. 5 Describe in details the cultivation of rice in SRI method on following points :-

i. Spacing and seedling ii. Weed management

iii. Water management iv. Yield

i. **Spacing and seedling:-** After the land preparation , transplanting is similar to that of low land rice cultivation . Single seedling is planted per hill therefore lines both ways have to be

drawn at a spacing of 25 x 25 or 30 x 30 cm with the held of marker.

Carefully lift the seedlings from the nursery. Banana leaf sheaths may be used for lifting the seedlings below the root system and carry to the main field. Place single seedling at 25 x 25 or 30 x 30cm intersecting points marked with the marker.

ii. **Weed management:** - Weed infestation is severe in this method. Hoeing with rotary weeder is effective in controlling the weeds. First hoeing should be done 10 DAP. About four hoeing are necessary till panicle initiation. Weeds near the plant should be removed with hand weeding. Working with rotary weeder in both the direction reduces the expenditure on hand weeding. After weeding , weed should be buried into the soil . This adds organic matter in the soil.

iii. **Water management** :- Regular water application is necessary to keep the soil moist in this methods. Stagnation of water in the field should be avoided. During vegetative phase field should not be flooded. Intermittent wetting and drying for adequate aeration is essential during this stage. However , during grain filling 1-3 cm water may be maintained in the field.

iv. **Yield** :- Mid late duration varieties of rice yielded 60 -70 q ha^{-1} grain
However, yield in short duration varieties is 45 -55 q ha^{-1} grain.
Grain yield from rice goes upto 75 -80 q ha^{-1}.

Q. 6 Prepare a leaflet on pigeon pea (Tur) in respect to following points :-

i. Soil and climate ii. Weed management
iii. Nutrient management iv. Harvesting , threshing and yield

i. **Soil and climate**

Soil:-It grows well on wide range of soils from sandy loams to clay loam. But it thrives best on fertile and well drained loamy soils. Well drained, alluvial and loamy soils are good for its cultivation. It can also be grown on heavy soil with good drainage as it is very susceptible to water logging during seedling stage. However saline-alkaline and waterlogged soils are not suitable for its cultivation, because nodulation is adversely affected.

Climate:-Pigeon pea grows mainly in tropical and sub tropical climate. During vegetative growth it prefers mostly moist and warm climate. However, during flowering , ripening and pod setting cool and bright sunny days are necessary. It is raised in area having 20-30°C temperature during kharif and 17-12°C during winter season. Cloudy weather and excessive rainfall at flowering damage the crop. It is highly susceptible even to light frost . Due to deep root system it can tolerate moisture stress to a great extent. It is grown in the area receiving rainfall only 650 mm.

ii. **Weed management** :-Some of the common weed associate with the p.pea are *Cyprus rotendus, Celosia argentena, Commolina bengalensis,Phylanthus niuri,etc.* Among the pulses p.pea grows very slowly during early growth period 45-50 days. If the weed are not properly controlled the yield reduction is noticed to the extent of 90 % . Weeding and hoeing at 25-30 and 45-50DAS found effective in controlling weeds. Pre-emergence herbicides application of Pendamethaline or Fluchoralin 1 kg ha^{-1} found to be effective.

iii. **Nutrient management:-** Pigeonpea responds less to fertilizer than other crop. 10 t ha^{-1} of FYM or compost per hectare should be applied to soil before last harrowing. Being a leguminous crop it utilizes atmospheric nitrogen fixation. 20kg N ha^{-1} for long and medium duration varieties and 25 kg N ha^{-1} for yearly varieties is required. Phosphorus @ 40kg ha^{-1} in soils medium in phosphorus and 50 kg ha^{-1} in soil deficient in phosphorus. OR as per recommendation of varieties .

iv. **Harvesting, threshing and yield:-** Red gram is an indeterminate growth type and the growth is continued with reproductive phase. The harvesting is done when 75 % pods turn brown. An extra early variety matures in 110-115 days, early varieties in 135-160 days, medium late varieties in 160-200 days and late varieties is more than 200 days. The harvesting is done with sickle by cutting the plants from 7.5 to 25 cm above the ground level. Harvested plants are left in the sun for drying.

Threshing either is done by beating the pods with stick or by mechanical thresher. The grain yield of pigeon pea ranges from 15-20 q ha^{-1} and 50-60 q ha^{-1} sticks can be obtained

Q. 7 Write in details regarding cultivation of *Kharif* sorghum on following points :-

i. Soil and climate ii. Intercropping
iii. Growth stages iv. Harvesting , threshing and yield

i **Soil and Climate :-**

Soils :- Sorghum is grown on wide range of soils but medium to deep soils having good water retention capacity are best suited to growing sorghum. It may tolerate mild acidity to mild salinity and can grow with wide range of soil pH (5.5 to 8.5).Black cotton soils of central India are very good for cultivation of sorghum.

Climate :- Sorghum requires warm climate but can be grown under a wide range of climatic conditions. In temperate regions, it is grown during summer , however in tropics it is sown throughout the year. It needs about 26-30 °C temperature for the optimum growth. The minimum temperature for germination is 7 - 10 °C. However, the yield is adversely affected when the mean temperature exceeds 26 °C during heading period. It is well adopted to semi arid region with a minimum annual precipitation 350-400 mm as well as rainfall ranging from 400-100 mm. It can tolerate drought conditions very well s it remains dormant during moisture stress. It can also tolerate water logging .Sorghum at boot leaf stage is very sensitive to temperature but less to soil stress than during flowering.

ii. **Intercropping :-**

Jowae + mung/udid (1:1)
Jowar + mung /Tur (3:3)
Cotton + jowar +tur + jowar (6:1:2:1)

iii. **Growth stages :-**

1. Seedling stage:- Germination takes place in 4 -5 days after sowing. Emergence of coleoptiles indicates seedling stage.
2. **Flag leaf stage:-** 3-4 leaves with fully expanded leaf area (40-45 DAS).
3. **Boot stage:-** Ear head covered with sheath i.e. under flag leaf (45 – 60 DAS).
4. **Soft dough :-** Endosperm filled with water fluid it is called as milk stage.(70 – 85 DAS).
5. Hard dough:- Three fourth of grain weight accumulated , grain contents relatively

solid.

6. **Physiological maturity:-** Maximum dry weight of grain and plant attained (85-95 DAS).

iv. **Harvesting, threshing and yield:-**Sorghum matures in 100 – 115 days. Harvesting should be done when the grains have become hard and contain 15-20 per cent moisture. Do not wait for stalk and leaves to dry . Stalk and leaves remain green and succulent in most of the cultivars though grains already mature. Harvesting is done by cutting the entire plant or removing the cobs first and cutting down the plant later on. Harvested ear head are dried in sun for a day or two or until grain moisture content drops to around 12 per cent.
Thrashing is done with the help of thresher or by beating the ear head with stick or trampling bullock.
Yield:-

Early varieties :- 45-50 q/ha (Grain)	85-90 q/ha (Straw)
Mid late varieties :- 48-50 q/ha (Grain)	100-110 q/ha (Straw)
Improved varieties :- 38-40 q/ha (Grain)	120-125 q/ha (Straw)

Q. 8 Advice farmer regarding cultivation of American cotton (rainfed) on following points :

i. Selection of genotypes ii. Nutrient management
iii. Critical growth stages iv. Picking and yield

i. **Selection of genotypes :-**
American cotton :- *Gossypium hirsutum* (n=26) New world cotton
AKH-081 , AKH-8828 , LRA5166 , PKV Rajat , DHY-286 , Renuka (NH-452), NH-545.

ii. **Nutrient management:-** Cotton is a heavy feeder and needs proper manuring for getting higher yield . Cotton yielding 500 kg ha^{-1} removes approximately 40 N,15 P_2O_5 ,17 K_2O. In tropical India ,crop yielding 3.2 t ha^{-1} seed cotton removes 190:60:200 kg N, P_2O_5 and K_2O.FYM or the compost @ 15-20 t ha^{-1}.This helps in better conservation of moisture in soil. Fertilizer application depends on the variety to be grown, yield potential, rainfed or irrigated and the nutrient supplying power of the soil. The dose of the NPK is not uniform in all the cotton growing tracts.
So, recommended dose of fertilizers should be applied (50:25:25) + *Azotobactor* treatment can save up to 20 kg N ha^{-1}.

iii. **Critical growth stages :-**

1. **Germination phase :-** Germination and emergence are completed in 4-7 days.
2. **Early vegetative phase :-** Characterized by a rapid root growth, slow growth of the main shoot and emergence of the first true leaf. This is followed by the growth of main stem and differentiation of early monopodial branches.
3. Squaring:- The first square (flower bud) appears between 35 – 70 days after germination depending on the variety ,location and crop husbandry. the squaring continues till maturity.
4. Flowering :- First flower appears about 20-35 days after the appearance of first square and flowering continues for about 60-80 days or more depending upon the availability of soil moisture. However, the peak flowering period is from 70-100 days after germination.
5. Boll development :- This period starts from flowering and continues till maturity.

After fertilization of flower , during first 15-18 days boll attain 90 % final size. The elongation of lint fibers in the boll is completed in 21-24 days. The boll cracks on maturity along the locules and fibers ultimately dry out and become ready for picking.

iv. **Picking and yield:-**Duration of cotton ranges from 150-200 days depending upon the variety. Cotton is harvested in 3-4 picking. First picking is done in the middle of October, second in the beginning of November and last in the first week of December should be done. Picking should be done when the bolls are fully burst and cotton hanged down. Picked clean cotton without dry leaves and burst. Dry the cotton in sun light for 2 -3 hours. Yield :- 15-20 q /ha.

Q. 9 Explain in details the cultivation of maize (Fodder) on the following points:-

i. Seed and sowing ii. Water management

iii. Nutrient management iv. Harvesting and Yield

i. **Seed and sowing :-** Maize is grown throughout the year in *kharif, rabi* and *summer* seasons in the month June - July, September-October and February-March, respectively. In North, it is sown from April to August and in south February to November . In the hills, the crop is sown in the month of May, after melting of snow and rise in temperature.

Usual seed rate varies from 40 to 50 kg ha^{-1} for hybrids . it is 60-75 kg ha^{-1}, where thin stemmed leafy crop is preferred the seed rate can be increased to 90 kg ha^{-1}.Maize is sown either as pure crop or in mixture with vigorous annual legumes like cowpea, velvet bean, rice bean , filed bean etc. When it is sown in mixture with cowpea 25kg of maize and 20 kg of cowpea my be sown in two lines of maize alternated by two lines of cowpea in east west direction.

Seed should be treated with thiram or carbendizium @ 3 g kg^{-1} seed to control seed borne diseases. Sowing is generally done with the help of seed drill.

ii. **Water management :-** Kharif crop does not need irrigation unless there is water stress. One irrigation at tassel formation should never be missed. Winter crop should be irrigated at an interval of every 20 to 25 days. However, in summer irrigation should be given 10 to 15 days depending upon the soil type. ,heat and atmospheric humidity.

iii. **Nutrient management :-**Well decomposed FYM or compost @ 15 to 25 t ha^{-1} should be applied before sowing. It is supplemented with 120 kg N, 40 kg P_2O_5 and 20 kg K_2Oha^{-1}. 60 kg nitrogen and entire dose of phosphorus and potash should be applied at the time of sowing. Remaining 60kg N should be applied at knee height stage. Spraying of 40-50 fortnight before harvest improves the CP content of the foliage.

v. **Harvesting and Yield:-**Maize is a fast growing crop and can be harvested at anytime between 50 and 80 days. A different variety takes 60 to 90 days for harvesting. Taller varieties take more time than shorter. Prior to tasselling the crop is richer in protein but falls sharply after the milk stage. As a green fodder, harvesting should be done at cob formation and completed before the milk stage. For silage, harvesting should be done when the cobs are in soft stage of grazed stage for high energy content.

In monsoon the forage yield is as high as 400 to 450 q ha^{-1}

In summer the yield does not exceed 300 q ha^{-1}

Q. 10 Write a short note on (any four)

i. Importance of pulses
ii. Benefit of miner millets
iii. Retting of jute
iv. Factor affecting pegging in groundnut
v. Economic importance of cluster bean
vi. Economics importance of sesame

i. **Importance of pulses:** - Higher nutritive value, in terms of protein. Pulses are the richest sources of protein as compared to cereals (20-25 % protein except in the case of soybean it content 40 to 42 % protein). Pulses help in soil and water conservation. Pulses provide superior quality fodder for cattle. Pulses have important role in crop rotation and mixed cropping. They fixed the atmospheric nitrogen and improved soil fertility.

ii. **Benefits of miner millet :-**

1. Ability to grow under scarce rainfall where cultivation of other crop is uneconomical.
2. Ability to grow under wide range of soil including infertile , alkaline, saline and acidic also.
3. Drought resistance even produce tiller after a prolong drought period .
4. Short duration (100 days)
5. Easy to cultivate with low cost
6. Higher nutritive value than major cereals.
7. Long storing capacity and free from storage pests.

iii. **Retting of jute:** - Retting is a microbial process by which the fibers in the bark get loosened from woody stack. It is a microbial process affected by various aerobic and anaerobic micro organisms. It is done in shallow cannel with slow running water or in the tanks with 2 m depth .Harvest bundle should be kept in standing in 30-60 cm deep water for 3-4 days before the entire bundle is stepped. Then bundle are placed side by side in 2-3 layers and tied together. Then they are covered with aquatic weeds and tide with rope. Put some heavy block on it. Best temperature for retting is 34°C .Examine the stems after 8 days. If the fiber slips easily separate from stem on pressure the thumb and finger then it is considered that retting is completed. Fiber should be extracted from the retted stacks gently keeping the stalks in water. Beating with wood stick should be avoided as it spoils the fiber quality. Extracted fiber should be dried in mild sun over a bamboo frame for 2-3 days.

iv. **Factor affecting pegging in groundnut:-**

1. If soil moisture drops to wilting points the process of pegging may stop and the formed pegs may die.
2. High light intensity affects pegging.
3. Daily minimum mean temperature is positively correlated with peg formation. Maximum temperature has negative effect.
4. Early formed flowers may inhibits the development of other flowers into peg.

v. **Economic importance of cluster bean:-**It is very important, drought resistant kharif/summer legume of the arid and semi arid regions. It is hardy quick growing and can tolerate high moisture, low fertility and soil salinity to some extent. Pods are used for vegetable purpose. The grains are used for high protein concentrate feed for animal. Grain are also used for extraction of gal actomannan gum as a binding agent in many textile

industries .It quick cover the land and reduces soil erosion. Forage used for hay making. It content 14-18 % CP, 1.26 to 2.28 EE, 22.70 – 31.91 % CF, 37.65 to48.30 % NFE, 8.27 - 17.0 Ash and 1.56 -3.65 % Ca.

iv. **Economics importance of sesame:** - It is most ancient oilseed crop of India nest to ground nut and *brassica* oilseeds. It is called as queen of soil seeds due to high quality polyunsaturated stable fatty acid. Sesame is rich in oil (50 %) and protein (18.20 %). About 78 % of sesame production in the country is used for oil extraction , 28 % edible purposes and 2 % seed purposes. Oil cake contains 6.0-6.2 5 N , 2- 2.2 % P_2O_5 and 1-1.2 % K_2O.

Section "B"

Q. 11 Fill in the blanks

i. Botanical name of blackgram is _____ *(Phaseolus mungo)*
ii. Fox tail millet is also known as _____ millet. *(Italian / German millet)*
iii. Cotton is the _____ of fiber. **(King)**
iv. Maize is the _____ of cereals. **(Queen)**
v. _____acid is synthesized by young sorghum crops. **(Hydrocyanic)**
vi. Castor oil cake contains _____acid which is unfit for cattle feeding. **(Recinoleic)**
vii. _____ bears the male flower in maize crop. **(Tassels)**
viii. Botanical name of *dhaincha* is _____ *(Sesbania aculecta)*

Q.12 Match the pairs :-

	"A"		"B"
i.	Red gram	g	Asha
ii.	Soybean	f	JS-335
iii.	*Deshi* cotton	c	*Gossypium arboreum*
iv.	Sunflower	h	Hand pollination
v.	Guinea grass	e	*Panicum maximum*
vi.	Groundnut	d	Peg formation
vii	Sunhemp	b	Green manuring
viii.	American cotton	a	*Gossypium hirsutum*

(A.B.Turkhede)
Associate Professor and course teacher
College of Agriculture, Akola
Mobile No. :- 9657725723

(Dr.V.M.Bhale)
Head Department of Agronomy
Dr. Panjabrao Deshmukh Krishi Vidyapeeth
Akola

*****