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LECTURE 4

BARLEY

Hordeum vulgare

- It is important next to rice, wheat, maize in area and production
- It is more suitable than wheat in India
  - Due to hardy nature
  - Can withstand adverse agro-environments like
    - Drought, Salinity, Alkalinity
    - Varied topography like plain, hill
    - Under rainfed and irrigated
  - It is the crop preferred by farmers where wheat is not possible

- **Origin**
  - 'Near-East region' as probable place of origin
  - Abyssinia - one group
  - SE Asia (China, Tibet, Nepal) another group
    - Archeological remains dates back
      - 8000 BC at Euphrates in Syria
      - Recent evidence from Aswan dam in Egypt about 16000BC

- **Economic importance**
  - It is a Rabi cereal
  - Food for people of cooler and semi-arid part of the world
  - In India 90% as human food
  - Used for malt, beer, whisky and industrial alcohol, vinegar
  - Energy rich drinks like bournvita, boost, horlicks are from barley malt
  - Medicinal value
    - Reduce cholestral level in liver
    - It also stimulates fatty acid synthsis in liver
  - In USA as cattle feed and horse feed
  - Biscuit making
  - Great demand to malting industry

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- Good quality grain production may open foreign exchanges
  - Protein-11.5%, carbohydrate-74%, fat-1.3%
  - Crude fibre -3.9%, ash -1.5%

Barley World scenario

Continent	Area (m ha)	Production (m t)	Productivity (t ha^{-1})
Africa	4.89	6.13	1.25
America	5.72	16.95	2.96
Asia	12.08	22.44	1.86
Europe	28.77	89.05	3.09
Oceana	4.05	4.07	1.01
India	0.70	1.22	1.74
World	55.52	138.64	2.50

(FAOSTAT, 2006)

Barley - Indian scenario

State	Area ('000 ha)	Production ('000 t)	Productivity (kg/ha)
UP	214.7	413.4	1925
Rajasthan	201.6	492.1	2441
MP	77.5	99.8	1288
Haryana	27	76	2815
Punjab	19	63	3316
HP	25.2	18.4	730
All India	629.9	1221	1938

(Ministry of Agriculture, Govt. of India, 2005-06)

- **Climatic requirement**
  - Similar to wheat
  - Performs well cool climate
  - Warm and moist conditions are not conducive
  - Can't tolerate frost

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- Frost and hail storm at flowering are detrimental

- **Soil requirement**
  - Tolerant to salinity and alkalinity but sensitive to acidity
  - Being salt tolerant best substitute for sodic soil
  - Drained, fertile deep loam soil with pH 7-8
  - Barley grown in high N often lodges

- **Season**
  - Rainfed before end of Oct
  - Irrigated I / II fortnight of Nov
  - Hilly zones as summer crop –Apr- May

- **Seed rate**
  - Irrigated – 100 kg/ha
  - Rainfed – 80-100 kg/ha

- **Spacing**
  - 22.5cm for irrigated and 22.5 to 25 for rainfed

- **Depth of sowing:** 5cm, if rainfed – 6-8cm
- **Varieties**
  - Two types Husk-less and Hulled barley
    - Husk-less preferred – Karan 18 & 19 –demand from farmers
  - Suited for hills
    - Himani – for medium to lower hills 140-145 days, 3-3.5t /ha
    - Dolma – Medium to high elevation, 140-145 days, 4.0t /ha
    - Kailash – six row hulled – medium to low elevation
  - Suited for rainfed areas
    - Ratna – six row-hulled, 125-130d, UP, WB, Bihar, 2.5 – 3.0t/ha
    - Vijay – 120-130d, UP, MP, Punjab, 3.0 -3.5t/ha
    - Azad – 115-120d, 3.5 – 3.8t/ha
    - Ameru – 130-133d, 2.5 03.0t/ha – best for malt
  - Suited for irrigated areas

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        - Jyoti – six row hulled, 120-125d, 3.5-4.0t/ha
        - Ranjit – Six row, semi dwarf, non lodging, 125-130d, 3.0-3.5t'ha
        - Clipper – Two row, 135-140d, 2.8-3.0t/ha best for malt & brewing
        - Karan 18 & 19 – 5.0 – 5.6t/ha
    - Dual purpose (fodder and grain)-
        - Ratna, Karan2, Karan 5, Karan 10

- **Selection of variety for malt purpose**
    - Plumpy medium good quality
    - Select the seeds having 1.2 to 1.5% N
    - Timely sown crop
    - Not from well fertilized soil

- **Land preparation**
    - Similar to wheat

- **Seed treatment**
    - Similar to wheat

- **Method of sowing**
    - Similar to wheat

- **Nutrient management**
    - FYM 12.5t/ha
    - N- P2O5- K2O
        - Irrigated – 60-30-20
        - Malt - 30-20-20
        - Rainfed - 40-20-20
    - Method of application
        - N 50% basal + P&K, I split at I irrigation
        - Entire basal for rainfed
        - Light soil 3 splits – I & II irrigations

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- **Water management**
  - 200-300mm
  - 2-3 irrigations
  - Critical periods
    - Seedling / sprouting
    - Active tillering
    - Flag leaf
    - Milking or soft dough stages
  - Tillering and grain filling so crucial

- **Weed management**
  - Up to 30 days
  - Post emergence herbicides Isoproturan 0.75kg/ha + 0.5 kg 2,4D EE 3-5 leaf stage
  - Or Pendimethalin (pre-emergence) 1.0kg/ha + one hand weeding

- **Cropping systems**
  - Rice-barley
  - Jowar – barley
  - Bajra- barley
  - Cotton-barley
  - Blackgram-barley
  - Mixed crops:
    - with Chickpea, pea, mustard, linseed, lentil

- **Harvest**
  - Similar to wheat
  - Storage
    - 10-12% moisture
  - Yield
    - 3.0 – 3.5t/ha,
    - straw 4.0-5.0t/ha

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Multiple choice questions

1. Centre of origin of Barley is _____
   a. America b. S. Africa **c. Asia & Ethiopia**
2. In India the highest producer of barley is _____
   a. **U.P** b. Punjab c. W.bengal
3. The inflorescence of barley is called _____
   a. Ear b. panicle **c. spike**
4. Most critical stage of irrigation in barley is _____
   a. **Tillering** b. CRI *c.* Flowering
5. Barley crop needs _____
   a. **Cold & dry climate** b. Hot & humid c. dry & hot
6. Photoperiodically, barley is a type of plant is _____
   a. Short day **b. Long day** c. Day neutral
7. Depth of sowing of barley is
   a. 1-2cm **b. 3-5 cm** c. 5-6cm
8. Shoot of barley is called

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a. Stem **b. Culm** c. Trunk

9. Leaf of barley is

a. Petiole **b. Sessile** c. both

10. Salt tolerant variety of barley

a. **Amber** b. Neelam c. RD137

11. _____ variety is suitable for malting

a. Amber b. Neelam **c. RD 137**

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