



FACULTY OF AGRICULTURAL SCIENCES & ALLIED INDUSTRIES

Rainfed Agriculture and Watershed Management

Lecture -10

Contingent Crop Planning for Aberrant Weather Conditions

Effect of aberrant weather conditions on crops

- Rainfall behavior in dry farming areas is erratic and uncertain.
- The deviations in rainfall behavior commonly met with in dry areas include delayed onset, early withdrawal and intermediary dry spells during rainy season.
- Suitable manipulations in crop management practices are needed to minimize such adverse effects of abnormal rainfall behavior.
- These management decisions, constitute contingency planning. Such management practices done after crop establishment and in the middle of crop growth are called mid-season or midterm corrections.

Rainfall aberrations	Effect on crops
Delay in onset of rainfall	Length of cropping season or cropping duration is reduced – crop sowing is delayed
Early withdrawal or cessation of rainfall	Moisture stress at maturity grain filling is affected
Intermediate dry spells	
2. Immediately after sowing	Germination will be affected; plant population will be reduced
3. At vegetative stage	Affects stem elongation, leaf area expansion, branching or tillering
4. At flowering	Affects anthesis and pollination, grain / pod number is reduced
5. At ripening	Grain filling and grain size reduced

Contingency cropping

Contingency cropping is growing of a suitable crop in place of normally sown highly profitable crop of the region due to aberrant weather conditions.

Or

To mitigate any unexpected, unfavorable, accidental weather conditions without prior information at any time before sowing or after sowing of crop.

- ❖ In dryland agriculture, contingency of growing another crop in place of normally grown crop arises due to delay in the onset of monsoon. Depending upon the date of receipt of rainfall, crops are selected. It is assumed that the rainfall for the subsequent period is

normal and depending upon the economic status of the farmer, certain amount of risk is taken to get good profits if season is normal or better than normal.

- ❖ Contingency cropping is **highly location specific** due to variation in amount and distribution of rainfall. Especially in arid regions, the spatial distribution of rainfall is highly variable. It is common to observe that rainfall received varies from field to field in the same location.

10.2 Six types of contingent crop plans. The types are:

1. Inadequate and Uneven Distribution of Rainfall
2. Long Gap in Rainfall
3. Early Onset of Monsoon
4. Late Onset of Monsoon
5. Early Cessation of Rains
6. Prolonged Dry Spells.

10.3.1 Contingent Crop Plan in Inadequate and Uneven Distribution of Rainfall

In general, the rainfall is low and highly variable which results in uncertain crop yields. Besides its uncertainty, the distribution of rainfall during the crop period is uneven, receiving high amount of rain, when it is not needed and lack of it when crop needs it.

- a) Short duration crops grown
- b) Cultivation of low water required crops
- c) Providing life saving irrigation

10.3.2 Contingent Crop Plan for Long Gap in Rainfall:

- a. Increase in seed rate to obtain more population
- b. Spraying of urea solution
- c. Providing life saving irrigation at critical growth stages
- d. Weeding and intercultural operations

10.3.3 Contingent Crop Plan for Early Onset of Monsoon:

- a) Cultivate Pearl millet, Sesame etc.
- b) Grow short duration crops
- c) Moisture conservation practices should be followed
- d) Use cultural methods to mitigate stress

10.3.4 Contingent Crop Plan for Late Onset of Monsoon:

Due to late onset of monsoon, the sowing of crops is delayed resulting in poor yields.

- a. Alternate crop & varieties: Castor (Aruna), green gram, cowpea, sunflower
- b. Dry sowing/Kurra sowing
- c. Pre sowing
- d. Seed soaking/treatment
- e. Alternate crops/ varieties
- f. Transplanting of one month old Bajra seedlings.
- g. Complete weed control
- h. Grow legumes/oilseed crops in place of cereals
- i. Most suitable crop for this condition is Sunflower.

10.3.5 Contingent Crop Plan for Early Cessation of Rains:

Sometimes the rain may cease very early in the season exposing the crop to drought during flowering and maturity stages which reduces the crop yields considerably:

- a. Select short duration varieties
- b. Using mulching/mulches
- c. Lifesaving irrigation applied
- d. Decrease in plant population

10.3.6 Contingent Crop Plan for Prolonged Dry Spells:

Long breaks in the rainy season are an important feature of Indian monsoon. These intervening dry spells when prolonged during crop period reduces crop growth and yield and when unduly prolonged crops fail.

- a) If mild moisture stress at 30-35 days after sowing, thinning of alternate rows of Sorghum and Pearl millet
- b) If severe moisture stress at 30-35 days after sowing, cutting of sorghum and Pearl millet and rationing
- c) If moisture stress at blooming stage, cutting of sorghum and Pearl millet and rationing
- d) Breaking of monsoon for short while, shallow inter cultivation for eradicating weeds/soil mulch
- e) Wider spacing for moisture conservation
- f) Spray of 2 % urea after drought period is useful for indeterminate crops like castor, pigeon pea and groundnut

- g) Soil mulching to reduce evaporation losses
- h) Lifesaving irrigation
- i) If dry spell in 10 days of sowing, resowing
- j) Weed control to save water, nutrients