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LECTURE NO. 10

CONTINGENT CROP PLANNING

FOR ABERRANT WEATHER

CONDITIONS



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10.1 Effect of aberrant weather conditions on crops

- ❖ Rainfall behaviour in dry farming areas is erratic and uncertain.
- ❖ The deviations in rainfall behaviour commonly met with in dry areas include delayed onset, early withdrawal and intermediary dry spells during rainy season.
- ❖ The adverse effect of these rainfall aberrations on crop growth vary with the degree of deviation and the crop growth stage at which such deviations occur .
- ❖ Suitable manipulations in crop management practices are needed to minimize such adverse effects of abnormal rainfall behaviour.



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These management decision, constitute contingency planning. Such management practices done after crop establishment and in the middle of crop growth are called mid season or mid term corrections

Table 10.1 Effect of rainfall aberrations on crops

Rainfall aberration	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 (terminal stress)
Intermediate dry spells	
a. Immediately after sowing	Germination will be affected, plant population will be reduced
b. At vegetative phase	Affects stem elongation, leaf area expansion, branching or tillering
c. At flowering	Affects anthesis and pollination, grain / pod number is reduced
d. At ripening	Grain filling and grain size reduced



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10.2 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. 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.



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- 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. Temperature gradually falls from August onwards reaching minimum in November and December. Contingency plan and midterm corrections vary with the type and time of occurrence of rainfall aberration (Table 10.2).



Table 10.2 Contingency crop plan for different abnormalities

Rainfall abnormality	Contingency plan and midterm correction
1. Delayed onset of rainfall	
a) Delay exceeding-4 weeks	Alternate crops of short duration to be sown
Delay in South west monsoon Normal - June Delay - July Delay - August	Groundnut Ragi / pearl millet Sama (little millet) / Cowpea
Delay in North east monsoon Normal - October Delay - Early November Delay - Late November	Cotton / Sorghum Sunflower / Pearl millet / Ragi Coriander / Bengalgram
b) Delay of 1 to 2 weeks	Alternate varieties of short duration of same crop Eg. Sorghum Co 19 (150 days) Co 25 (110 days), Red gram local (180 days) Co 5 (130 days)
2. Early withdrawal of rainfall	Antitranspirant spray, harvesting for fodder (millets), harvesting at physiological maturity



3. Intermediary dry spell	
a. Immediately after sowing	Gap filling with subsequent rains if stand reduction is less than 20%. Re-sowing if stand reduction is more than 20%, mulching between crop rows. Stirring soil surface to create dust mulch to reduce evaporation
b. At vegetative phase	Mulching, antitranspirant spray, spraying potassium chloride, thinning of 33-50 % population
c. At flowering	Antitranspirant spray, harvesting for fodder and ratooning with subsequent rains in millets (e.g sorghum)
d. At ripening	Antitranspirant spray, harvesting for fodder, harvesting at physiological maturity



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- ❖ Crops have to be selected with suitable crop duration to coincide with the length of the growing season.
- ❖ Generally short duration pulses like greengram, blackgram and cowpea may suit the situation.
- ❖ However if the monsoon turns to be extraordinarily good, opportunity is lost if only short duration crops are sown.
- ❖ Farmers with economic strength and motivation for high profits with some amount of risk can go for crops of long duration.
- ❖ The long duration crops with flexibility or elasticity in yield are more suitable.
- ❖ For example, pearl millet, and sorghum can be ratooned if monsoon extends. Sunflower can be introduced for higher profits with certain amount of risk.



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- ❖ Crops like Bajra, Jowar can be grown for grain if monsoon extends and if not, fodder can be obtained.
- ❖ Contingency crops for different situations and regions of Andhra Pradesh and other states are suggested in Tables 10.3 & 10.4

Table 10.3 Suggested contingency cropping for different situations in Andhra Pradesh

Time of onset of sowing rains	Crop	Varieties	Regions/situation
May	Sesamum	Madhavi, Gowri	Medium black soils, medium and deep red soils
June	Sorghum	CSH-5, CSH-9, CSH-10, CSH-11, CSV-1.1, CSV-12, SPV-462, SPV-475	Red soils, light black soils.
	Castor	Kranthi, Haritha	Telengana region
July	Groundnut	TMV. 2, Tirupati-1, Vemana,	Scarce rainfall zone of A.P.
August	Cotton	Mahanandi, NHH-4, Jayadhar, MCU-5	First fortnight of August, Arid
	Groundnut	TMV-2,	Regions of Anantapur
September	Pearl millet	ICTP 8203 WCC-75	Red soils.
	Sunflower	MFSH-1, MFSH-8, MFSH-17, APSH-1L	Red soils and black soils
	Setaria	Lepakshi, Prasad, Srilakshmi	Black soils, deep red soils
	Sunflower	MFSH-1, MFSH-8, MFSH-17, APSH-1J, Adarsha	Black soils .
	Redgram	LRG-30, LRG-41	Red soils in regions receiving North- East Monsoon rainfall
October	Sorghum	NTJ-1, NTJ-2, M-35-1, CSH-5	Red and Black soils
	Tobacco	Natu special, Sun cured natu	Black soils, deep red soils
	Sorghum	M-35-1, CSH-7R, CSH-6R, CSH-13R, NTJ-1, NTJ-2, N-13, N-14	Black soils
	Coriander	CS-4, CS-6	Black soils



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November	Sunflower	Any hybrid	Black soils
	Sorghum	Rabi varieties	Black soils
	Bengal gram	Annegiri, ICCV-2 (Swetha), ICCV-37(Kranthi), JG-11	Black soils
	Safflower	Manjira, Sagar muthyalu	Black soils
	Coriander	CS-6	Black soils



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THANK YOU