Advisories to mitigate the impact of drought in sugarcane

- **Foliar application of 2.5% urea and potash each in 200 litres of water per acre during drought period at 15 to 20 days interval to maintain the crop turgidity.**

  Foliar spray of 2.5% urea (i.e. 2.5 kg urea in 100 litres of water) has been found to maintain optimum nitrogen content in plants. Potassium maintains cell turgidity and it is known to help in the formation of 'proline' which imparts ability to the plant to withstand stress. Therefore combined application of urea and muriate of potash at 15 to 20 days interval is helpful to retain more number of vigorous shoots till the moisture conditions become favourable.

  Best time for foliar application is either morning or evening. Noon hours should be avoided as the stomata close during that time. Heavy winds may also affect foliar spray. Excessive spray should be avoided as the excess would simply drip down. When cane is subjected to stress during late growth and maturity phase, application of potassium and mulching alternate rows have been found to be highly economical and advantageous in increasing yield and quality, particularly in small and marginal holdings.

- **Trash mulching to conserve soil moisture, check weed growth and to reduce the soil temperature by 2°C.**

  Trash mulching conserves soil moisture and reduces the impact of moisture stress. Besides it also moderates soil temperature, increases microbial activity, helps in improving germination, better tiller survival and checks weed growth. In the long run, soil organic carbon content is also improved. In a multi-location trial in Tamil Nadu, 36% higher germination was observed under trash mulching as compared to control when sugarcane was planted during the hot weather period. This ultimately led to about 20% higher stalk population and 10% higher cane yield. Under mulching soil temperature was reduced by 2.1°C under trash cover, creating a more favourable environment for crop growth. Other farm wastes like leaves, straw etc. and transparent polythene sheet can also be used for mulching wherever possible which will help to conserve the available soil moisture. Trash and the bottom senescent green leaves excluding the top 6 - 7 green leaves may be stripped and mulched in situ.

- **Adopting alternate / skip furrow irrigation to conserve irrigation water and to save the crop from drying**

  In skip furrow irrigation alternate furrows are skipped by bringing two rows of crop together under a common furrow for irrigation. The crop population remains the same whereas the number of furrows irrigated gets reduced. There are reports which show that there could be a saving of 30 to 36% in the quantity of irrigation water by adopting skip furrow method of irrigation. However, a reduction of 14% in the cane yield has also been reported. In experiments conducted at IISR, Lucknow skip-furrow irrigation resulted in 36.5% saving of water and increased water use efficiency by 64%. In alternate furrow irrigation odd furrows in the first irrigation and the subsequent irrigation is on the even furrows and the cycle is repeated. This saves 41% irrigation water. But the cane yield may be reduced to the extent of 26%. This method could be adopted when
there is scarcity of irrigation water and getting back to normal furrow irrigation is possible whenever the availability of irrigation water improves.

- **Spraying of 6% kaolin as an anti transpirant reduces the evapotranspiration and acts as a reflectant**

  Anti-transpirants like kaolin reduces the transpiration loss of water and mitigates the ill effects of moisture stress. 'Kaolin' acts as a reflectant and reduces evapo-transpiration. It is to be sprayed over the leaf canopy at a concentration of 6% weight/volume.

**Reviving the crop after drought**

- **Application of additional dose of potash @ 40kg potash/acre in drought prone areas and application of last dose of fertilizers after drought is over to boost the crop growth.**

  Additional potassium application @ 60 kg K₂O/ha after the stress period has been found useful to increase cane yields and sugar recoveries. Potassium maintains the turgidity of plant cells, *viz.* low availability decreases moisture content in plants. Therefore, K application is necessary to maintain moisture content in plants at optimum level.
Measures to mitigate drought

- De-silting and maintenance of irrigation canals. Constructing / improving tanks, percolation ponds, recharge wells and check dams to improve water table through ground water recharge.
- Growing short duration alternate crops for profitable use of available water to meet the livelihood needs.
- **Crop planning:** Restricting the area under sugarcane based on the water availability during the peak summer.
- Adoption of drip irrigation with fertigation.
- Varietal diversification by including drought tolerant varieties.
- **Seed treatment:** Soaking the setts in a saturated lime solution for one hour before planting (prepared by dissolving 80 kg of burnt lime in 400 litres of water).
- **Early Planting:** In the tropical belt, November to January planting is better than March- April planting to overcome the problem of moisture stress during formative phase in drought prone areas.
- **Variety:** Co 86032 is drought tolerant and has the capacity for faster revival when water supply improves. Other tolerant varieties like Co 99004 (Damodar), Co 2001-13 (Sulabh) and Co 2001-15 (Mangal), Co 0218, Co 0403 and Co 0212 are suitable for water limited condition. In addition short duration early maturing varieties may be tried in the selected factory zones as a means of reducing the loss due to drought that occurs during the maturity phase.
- **Seed rate and spacing:** Higher seed rate and closer spacing to establish a higher stalk population in drought prone areas.
- **Deep trench system of planting:** Deep trench system of planting helps deep root development and efficient use of nutrients and moisture in areas where there is early drought and late water logging.
- Effective seed nursery programme to ensure supply of quality planting material.
- Farmer friendly and effective crop insurance schemes.
- Improving the soil organic matter content by growing green manure crops and application of organic manures.
- Groundwater recharging should get top priority and any drought mitigation schemes should incorporate this key component. Improvement and maintenance of the water harvesting structures.
- Maintenance of irrigation canals to ensure adequate water supply to tail end areas.
- Construction of farm ponds.