Drought Management
FACTSHEET

BRITISH COLUMBIA
Ministry of Agriculture and Lands

Drought Management Factsheet - No. 2 in Series

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KEY DROUGHT MANAGEMENT TIPS

Key Points

Key management choices when dealing with insufficient irrigation water supply include:

- reducing irrigated acreage
- reducing amount of irrigation water applied to all acres
- substituting low-water requirement crops for high-water requirement crops
- delaying irrigation until a critical water stage
- managing soil to capture precipitation
- applying only enough water to meet evapotranspiration losses (scheduling irrigation)
- monitoring conditions by ***"keeping the producers shadow in the field"***

Reducing Total Irrigated Acreage. This allows the amount of irrigation per acre to more closely match full irrigation requirements and normal yields. If drought conditions are not too severe, the land under dryland production will still produce some yield.

Reducing Amount of Irrigation Per Acre. Reducing the amount of water applied to all acres creates the possibility of near normal yields if above normal precipitation occurs. Below normal yields will result if rainfall is normal or less.

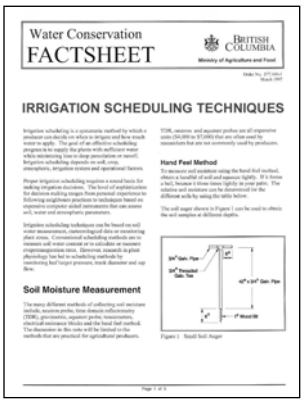
Substituting Crops. Changing to low-water requirement crops for high-water requirement crops will reduce water demand. This option is available if you normally plant annual crops, or if you are planning to re-seed your perennial crops. Many annual crops, such as cereals, use less water than perennials because the annuals grow for fewer days to complete their life cycle. Splitting fields between low-water requirement crops and high-water requirement crops can reduce total water requirements, and may also better distribute water use across the growing season. For example, peak water requirements of barley are in late May and June, whereas corn peak requirements are in July and August. Alfalfa water requirements are relatively constant throughout the season.

Delaying Irrigation Until a Critical Stage. This is possible if withdrawal rates are normal, even when total water volume is reduced. Some crops, such as corn and cereals, have critical water requirements during flowering and grain filling growth stages. During vegetative growth of cereal crops, some moisture stress can be tolerated and root growth is encouraged so the crop uses deeper soil water. Established forage crops do not have a critical period and generally respond in a linear fashion to available water. New seedings have a critical requirement to germinate and become established, so water must be available during this period.

Managing the Soil to Capture Precipitation. It is important to conserve any moisture that is in the soil, and to make the most efficient use of precipitation and irrigation. Crop residues on the soil surface intercept rainfall and irrigation, enhance infiltration and reduce soil evaporation. Tillage operations prior to seeding should be kept to a minimum to avoid drying the soil and burying crop residues. Use minimum till or no till techniques to conserve moisture. Refer to Factsheet No. 8 in this series: Tillage, Residue Management and Their Effect on Soil Moisture

Scheduling Irrigation. Scheduling irrigation is matching the sites soil moisture and the evapotranspiration (ET) to the irrigation required, by:

- **measuring soil moisture** and irrigating as soil moisture levels require
  - tensiometers or electrical resistance blocks in the soil measure moisture levels
- **or calculating or measuring ET** and using the water budget method to estimate soil moisture, then irrigating when required
  - obtain ET using an on-site evaporation pan or local weather station data
  - www.Farmwest.com where daily ET is available for many areas of southern BC


Water Conservation
FACTSHEET
BRITISH COLUMBIA
Ministry of Agriculture and Food
IRRIGATION SCHEDULING TECHNIQUES
Hand Feel Method
Soil Moisture Measurement

For scheduling information, refer to these Factsheets, available at the web site below:
Factsheet No. 577.100-1 ***Irrigation Scheduling Techniques***
Factsheet No. 577.100-2 ***Irrigation Scheduling with Tensiometers***
Factsheet No. 577.100-3 ***Sprinkler Irrigation Scheduling using a Water Budget Method***
http://www.al.gov.bc.ca/resmgmt/publist/Water.htm#irrigsched

"Keeping Grower Shadow in the Field" If you are not monitoring soil and crop conditions, you cannot manage effectively.

- know soil moisture conditions using the hand feel method (*dig-look-judge-respond*):
  - *dig* – to see the soil below the field surface (a soil auger works well)
  - *look* – what is seen when looking at the soil?
  - *judge* – is the soil moisture sufficient?
  - *respond* – make appropriate changes to the irrigation schedule

Refer to Factsheet ***Estimating Soil Moisture by Appearance and Feel***
http://ianrpubs.unl.edu/irrigation/g690.htm

Other Management Considerations

Know Your Conditions

- **know the soil**: how many inches of water can be stored in the soil? does the soil have a hardpan layer that restricts root growth?
- **know the crop(s)**: what is the crop rooting depth? what is the drought tolerance of your crop? does the crop have any critical moisture requirement times?
- **know the water supply** (storage, surface, or groundwater) if storing water, what percentage of normal is expected? (i.e., the reservoir is only 65% full); if using stream water directly, when will water shortages be expected? (i.e., late summer)
- **know the irrigation system**: is your irrigation system operating efficiently? has it been assessed recently?
- **know the cropping systems**: consider a combination of annuals and perennials that will reduce your water demand, and reduce your risk of major crop loss

Fertilizer Use

- plan your fertilizer program based on expected yields under drought conditions

Weed Control

- weed control is even more important during drought conditions, as weeds use available moisture, often using moisture before crop requirements are met

Summary

To make the most efficient use of limited irrigation supplies will require planning and changes in how you manage during drought conditions. The other Factsheets in this drought management series, as well as others referred to, provide further information to help in making these management decisions.

Written by Edward L. Moore, P.Ag. under contract funded by:
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www.infobasket.gov.bc.ca or contact your
local Ministry of Agriculture and Land office