



*Dealing with Drought in BC*  
 Ministry of Agriculture and Lands



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**Water Sources for Agricultural Irrigation in BC**

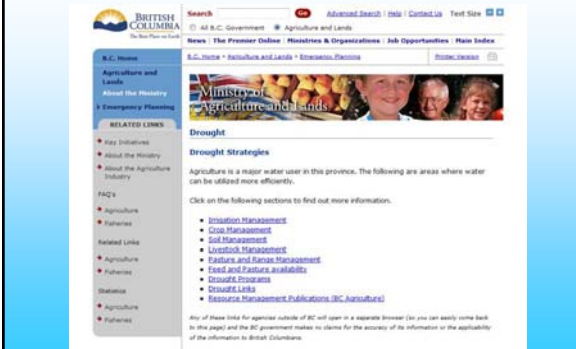
Water Use	
<b>Surface Water:</b>	
Self Pumped	65%
Supplied by a purveyor	23%
<b>Groundwater</b>	
Self Pumped	7%
Supplied by a purveyor	5%
<b>Dams and Storage</b>	2500



**Agriculture Drought Planning**

- Integrated with Ministry of Environment drought strategy
- Web site contains information on drought planning for agriculture
- Agricultural Water Demand Initiative
- Irrigation design and management information
- Irrigation Scheduling Calculator
- Environment Farm Planning – conversion to more efficient systems

**Drought Web Site**

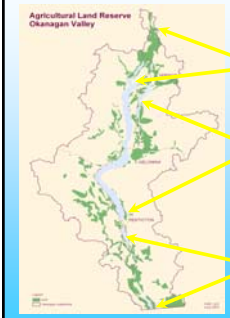


The screenshot shows the website's navigation menu, search bar, and a 'Drought' section with 'Drought Strategies'. The strategies listed include Irrigation Management, Crop Management, Soil Management, Livestock Management, Pasture and Range Management, Feed and Pasture availability, Drought Programs, and Drought Links. There are also 'RELATED LINKS' and 'FACTS' sections visible.

**Drought Management Factsheets**

- Managing Irrigated Forage Crops During Drought – An Introduction
- Key Drought Management Tips
- Forage Crops and Irrigation Management in Drought Conditions
- Irrigation Decisions with Limited Water
- Irrigated Alfalfa Management under Drought Conditions
- Alternate Forage Crops When Irrigation Water is Limited
- Drought Impacts on Soil Fertility
- Tillage, Residue Management and Their Effect on Soil Moisture

**Okanagan Water Management**




- Northern Basin**
  - Peak flow rates 4.5 – 5 gpm/acre
  - Annual requirement 16 – 26 inches  
400 – 650 mm
- Center Basin**
  - Peak flow rates 6 – 7.5 gpm/acre
  - Annual requirement 20 – 30 inches  
625 – 750 mm
- South Basin**
  - Peak flow rates 8 - 9 gpm/acre
  - Annual requirement 30 – 40 inches  
750 – 1000 mm

## Agriculture Water Demand Model

**Objective:**  
Develop a model that calculates agriculture's water needs by purveyor, municipality, district and sub-watershed.

**Methodology:**  
Determine Property-by-Property water use



**Result:**  
Planning Tools that secure water for current and future agricultural needs





## Land Use Inventory

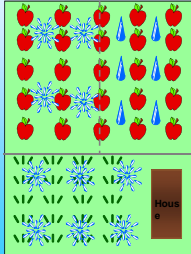
Collect and link information on crop type and irrigation system type

**Crop Type:**

-  Apple
-  Pasture

**Irrigation System Type:**

-  Sprinkler
-  Drip



## Agricultural Metering


- Metering allows for:
  - Monitoring of actual use
  - Allows targeting of high water users
  - Can be used to allocate water during a drought
  - Develop an equitable pricing structure – increasing block rate

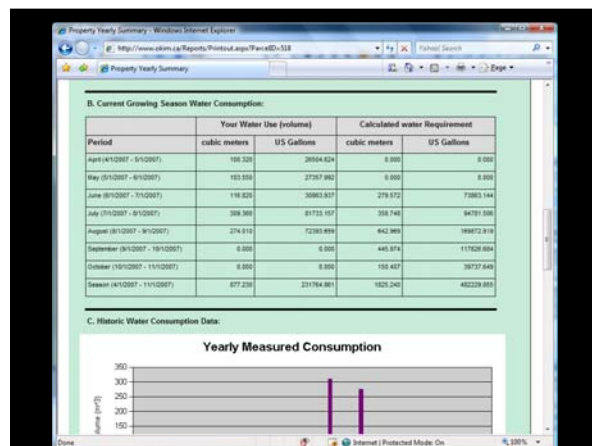


## Okanagan Irrigation Management Program

Model developed for purveyors that will link:

- Land use / irrigation system / calculated water use
- Meter / water use





Period	Year Water Use (inflows)		Calculated water Requirement	
	cubic meters	US Gallons	cubic meters	US Gallons
April (4/1/2007 - 6/1/2007)	109,320	289,044,624	0.000	0.000
May (6/1/2007 - 6/1/2007)	103,339	273,977,860	0.000	0.000
June (6/1/2007 - 7/1/2007)	118,820	309,837,837	279,872	738,314
July (7/1/2007 - 8/1/2007)	309,360	817,331,617	358,748	947,915,680
August (8/1/2007 - 9/1/2007)	274,819	723,851,898	842,989	2,218,721,819
September (9/1/2007 - 10/1/2007)	0.000	0.000	445,874	1,170,268,694
October (10/1/2007 - 11/1/2007)	0.000	0.000	106,427	281,737,649
Season (4/1/2007 - 11/1/2007)	617,230	1,617,964,861	1,623,240	4,252,291,853

### Irrigation System Performance

- Efficiency:** Select the most efficient type of irrigation system possible
- Uniformity:** Design the system to obtain the best uniformity
- Scheduling:** Schedule irrigation timing according to local site, soil moisture and climate data



### Irrigation Management

- Irrigate early in the season**
- Irrigate later in season**



### Irrigation Demand Model



Crop Group	Irrigated Area (ha)	Irrigation Demand (mm)
Apple	8,262	688
Berry	62	633
Cherry	1,121	733
Forage	8,520	755
Fruit	888	793
Golf	1,048	992
Grape	2,756	813
Landscape Turf	128	1,009
Nursery	385	909
Turf Farm	120	969
Vegetables	531	692
<b>Total =</b>	<b>20,033</b>	<b>704</b>

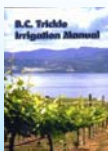
### Results

By Irrigation System

Irrigation System	Irrigated Area (ha)	Irrigation Demand (mm)
Drip	1,490	415
Golfsprinkler	1,045	992
Gun	308	1,118
Handline	1,390	792
Landscape Sprinkler	383	674
Microspray	466	661
Microsprinkler	1,548	674
Overtree Drip	220	447
Overtree Microsprinkler	16	737
Pivot	555	536
Pivot - Low Pressure	20	543
SDI	42	548
Sprinkler	3,602	739
Solid Set Gun	12	772
Solid Set Over tree	3,073	604
Solid Set Sprinkler	134	709
Solid Set Undertree	1,790	791
Travelling gun	2,079	751
Wheelline	1,661	751
<b>Total =</b>	<b>20,033</b>	<b>704</b>



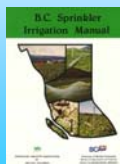
### Irrigation Design Guides



Trickle



Sprinkler



### Certified Irrigation Designer (CID)

**Certification**

**Certified Irrigation Designer Program**

The Certified Irrigation Designer (CID) Program is a professional certification program for irrigation designers in British Columbia. The program is designed to ensure that irrigation designers have the necessary skills and knowledge to design and install irrigation systems that are efficient, effective, and sustainable.

**Program Objectives:**

- Ensure that irrigation designers are equipped with the necessary skills and knowledge to design and install irrigation systems that are efficient, effective, and sustainable.
- Provide a professional certification program for irrigation designers in British Columbia.
- Ensure that irrigation designers are held to a high standard of professional conduct and ethics.

**Requirements:**

- 1. Pass a written exam

Certification is available in:

- Ag Sprinkler
- Ag Drip
- Turf Residential
- Turf Commercial



Requirements:

1. Pass a written exam

## Irrigation Scheduling Techniques


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1. Soil Moisture Monitoring
2. Climate Monitoring





## Soil Moisture Monitoring


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Electrical Resistance Block  
Watermark



Tensiometer





TDR




## Climate Monitoring


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Climate Station

## Irrigation Scheduling Calculator







## Environmental Farm Planning


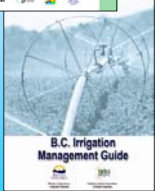




Irrigation Management Plan:

- Assesses system performance
- Evaluates crop and soil
- Determines when to irrigate
- How much to irrigate
- Energy Use
- Fertigation

## Agriculture Irrigation System Assessment

Environmental Farm Planning Process  
Sprinkler and Trickle/Drip Systems:

- Agricultural irrigation management
- System assessment
- Operation
- Scheduling
- Energy efficiency