

2009-2010 Irrigation Scheduling – Table Grape Update for Growers



It was a dry season....

With only 590mm of rainfall this year (July 2009 – June 2010) and only 110mm falling between October and April (40mm fell in 1 day in March), this growing season was one of the driest years on record.

Rainfall figures for December 2009, January and February 2010 were recorded in the lowest 10% (decile 1) of rainfall records collected at Perth Airport.

Combine a dry year with a relatively low percentage of rainfall that is effective (canopy interception is very high) and hits the vineyard floor, the water use equation stacked against the grower/irrigator to keep within a set water resource allocation of 5000kL/ha.

But, if you know the efficiency and application rate of your irrigation system, the vine water requirement at a particular time of the year and the water holding capacity of your soil then you may be able to manage the uncertainty of each growing season, hopefully keep within your water budget and possibly save water and money along the way.

Perth Airport Weather Conditions (Sept 2009-April 2010)

	Sept	Oct	Nov	Dec	Jan	Feb	March	April
Rainfall (mm)	93.2	6.8	38.2	0.0	0.0	0.2	40.2	25
Avg 3pm temp (°C)	17.2	21.9	24.6	28.5	31.3	29.6	28.8	23.8
Max temp (°C)	26.5	36.9	35.8	39.6	42.9	41.5	41	32.3
Evap (mm)	95.4	166.2	218.8	309.6	344.6	257.2	236.6	133.4

Soil Texture and Water Holding Capacity (readily available water)

A quick refresher on how soil texture can influence water holding capacity of different soil types. There are many different soil types in the Swan Valley from grey sands in Henley Brook and parts of West Swan to gravelly clay soils near Baskerville. Each soil type has the ability to hold different amounts of water and if gravel is present then water holding capacity may be significantly reduced.

At -40kPa tension (refill point for table grape crops under production), the approximate readily available water and total available water for different soil textures are:

Soil Texture	Readily Available Water (mm/m)	Total Available Water (mm/m)
Sand	35	60
Sandy Loam	60	115
Loam	70	150
Clay Loam	55	150
Light Clay	45	150
Medium to Heavy Clay	45	140

Note – total available water includes all water held in the profile including hygroscopic, capillary and gravitational water. Hygroscopic and gravitational may not be available to the plant.

Example

Soil Texture: 20cm of Clay loam (55mm/m) over 30cm of Light Clay (45mm/m)

0.2m x 55mm/m = 11mm

0.3m x 45mm/m = 13.5mm

Rootzone RAW = 24.5mm of readily available water (in the rootzone)

Approximate Irrigation Usage for 2009-2010 season (what did you use?)

In general, irrigation water use for the 2009-2010 season increased slightly due to the dry summer. The tables below have been produced for those on sprinkler and drip irrigation for the last growing season.

Scenario for Sprinkler Irrigation – Crimson Seedless Table Grape

	Oct	Nov	Dec	Jan	Feb	March	April	Total
Evap (mm)	116	218.8	309.6	344.6	257.2	236.6	133.4	1596.2
Rain (mm)	0	35	0	0	0	44	20	99
Crop Factor	0.25	0.25	0.3	0.44	0.5	0.5	0.4	
CWR (mm)	29	54.7	92.8	151.6	128.6	118.3	53.3	628.3
kL/ha	290	547	928	1516	1286	1183	533	6283
kL/ha minus rainfall (50% effective)	290	529.5	928	1516	1286	1161	523	<u>6233</u>

Scenario for Drip Irrigation – Crimson Seedless Table Grape

4L/hour dripline @ 0.7m spacing

2.0m vine spacing, 3.5m row spacing

1428 vines/ha

	Oct	Nov	Dec	Jan	Feb	March	April	Total
Evap (mm)	116	218.8	309.6	344.6	257.2	236.6	133.4	1596.2
Rain (mm)	0	35	0	0	0	44	20	99
Crop Factor	0.2	0.25	0.3	0.44	0.5	0.5	0.4	
CWR – drip(L/vine)	162	383	650	1061	900	828	327	4311
kL/ha	231	546	928	1515	1285	1182	466	6153
kL/ha minus rainfall (50% effective)	231	528.5	928	1515	1285	1160	456	<u>6103</u>

As you can see, if you delivered water to the vines via drip and micro sprinkler irrigation systems, both were over the 5000kL/ha budget amount with drip being 1103kl/ha over and micro sprinklers being 1233kl/ha over.

Kind regards,

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