

March 2009 in brief:

Rainfall at the Royal Botanic Gardens:	41.0 mm
Interception loss:	25.0 mm
Effective rainfall reaching ground:	16.0 mm

The March rainfall was less than the long-term average measured by the Bureau of Meteorology at the city observing station, which is 50.2 mm. The long-term average is for 6.1 days in March to receive at least 1 mm of rain. In March 2009, 10 days exceeded this value, indicating that the rain arrived in a number of quite small falls.

Table 1: March 2009 rainfall summary, Royal Botanic Gardens, for each rain day. (note: intensities could not be calculated for the 0.5 mm of rain received on 1 March and 24 March, since this rain fell for only a brief period).

Date (2009)	Rainfall (mm)	approximate rain duration (hour)	average rainfall rate (mm/h)
3 March	3.5	4	0.8
4 March	1.5	5.25	0.3
5 March	3.0	4	0.8
6 March	2.5	5	0.5
11 March	1.0	0.25	4.0
12 March	6.0	5	1.2
14 March	18.0	9	2.0
15 March	1.5	3	0.5
23 March	1.0	2.5	0.4
25 March	2.0	3.5	0.6

Table 2: March 2009 throughfall summary, Royal Botanic Gardens, for each rain day. (This Table lists the throughfall expressed as a percentage of the open-field rainfall for each day). Days when irrigation occurred are not included in the table or the calculations shown here.

Date (2009)	Throughfall % AFW1	Throughfall % AFW2	Throughfall % AFW3	Throughfall % AFW4	Throughfall % HB
1 March	34.6	0	0	17.3	0
3 March	7.4	14.8	7.4	14.8	9.9
6 March	24.2	6.9	6.9	6.9	6.9
11 March	8.7	17.3	8.7	0	8.6
12 March	30.3	18.7	36.1	31.7	4.3
14 March	60.1	114.4*	36.6	57.7	57.7
15 March	5.8	23.1	0	0	5.8
23 March	0	0	0	0	0
24 March	0	0	0	0	0
25 March	21.6	0	4.3	12.9	0
<i>average effective rainfall (mm)</i>	14.3	22.9	9.3	13.3	11.4

NB: AFW = Australian Forest Walk (sites 1, 2, 3, and 4).
HB = Herbarium bed.

* this value exceeds the open-field rainfall, and may reflect unrecorded operation of the irrigation system adjacent to this throughfall trough.

Brief commentary on the results for March 2009:

On days when there was no active irrigation in the gardens, the total rainfall was 36.5 mm. The rain was of low intensity, only averaging 1.1 mm/h, but reached 2 mm/h on March 14, and briefly reached 4 mm/h on March 11. The total rainfall for the month (41.0 mm) included some rain days when the gardens were irrigated, and data from these days cannot be interpreted, because the throughfall troughs collect some irrigation water.

The average fraction of the open-field rain falling through the tree canopy across the five monitoring sites was 39.0%. The highest proportion was at AFW1 on 14 March (60.1%) and the lowest at several sites and dates with low rainfall amounts was 0%.

The average interception loss rate was 61%. This is a high figure but not surprising in view of the low rainfall intensities, frequent small rainfall events, and mild temperatures. The lowest daily loss was 39.9% at AFW1 on 14 March, the wettest day recorded during this month.

From the total of 41.0 mm of open-field rainfall, the total effective rainfall arriving at the ground, averaged across AFW1, AFW2, AFW3, AFW4 and HB, was 16 mm. Thus, less than half of the open-field rainfall arrived at the ground under the trees and shrubs. There is some variation among the sites, related to the kind and density of the foliage above the throughfall collectors.

If these results are compared for those of December 2008, the previous month with significant rainfall, it will be seen that the March rainfall had a lower average intensity (1.1 mm/h compared with 1.7 mm/h in December 2008). The total rainfall for the month was also lower (40.1 mm compared with 80.5 mm in December 2008), and was spread across several more rain days than was the larger December total.

It is not surprising therefore that interception losses are higher for March 2009, reflecting these rainfall characteristics. In December 2008, three days recorded more than 10 mm of rain, but in March 2009, there was only one such rain day. Moreover, in December 2008 only one rain day recorded 2 mm of rain or less, but in March, 5 such days were recorded. Rain days with small totals are generally associated with high interception losses, since the small amount of water involved can readily be held on the foliage and branches, and is thereby prevented from reaching the ground.