

# How Much Water and Nitrogen is Wasted When a Hose is Used?

Water plays a critical role in the growth and development of plants. Growers use a substantial amount of water daily to fertigate (fertilize while irrigating). This poses the questions, how much fertilizer and water do we waste when watering with a hose and how does this fit into the concept of sustainable agriculture? In a recent study, this was examined using impatiens as the study crop, and control release fertilizer (CRF) and water soluble fertilizer (WSF).

A setup was created where potted plants were placed over a plastic cup to collect "leachate. Between plastic containers another plastic container without plants collected water that would have been lost between "benches". The total volume of water used to irrigate, volume leached and volume lost (included bench water) was determined.

Volume of water or fertilizer solution applied and volume leached and lost increase slightly over time (Table 1). Increased area of fertigation as the plants grew increased the irrigation time and amount of water that fell outside the containers. Fertigation of WSF lead to a greater loss (35.5%) in N compared to CRF (7.5%).

Table 1. Applied water or fertilizer leached through the containers or lost when moving the hose from plant to plant.

Treatment	Applied (gal)	Leached (gal)	Leached %	Lost (gal)	Lost %	Leached + Lost %
	Week 1	NA	NA			
5-6M-CRF	3.5	1.4	40.0	0.95	27.1	67.1
8-9M-CRF	3.0	1.1	36.7	0.7	23.3	60.0
WSF	3.1	1.1	36.7	0.9	29.0	65.7
Mean	3.2	1.2	37.8	0.85	26.4	64.2
	Week 3	NA	NA			
5-6M-CRF	6.1	1.4	22.9	2.1	34.4	57.3
8-9M-CRF	5.9	1.3	22.0	2.0	33.9	55.9
WSF	6.7	1.2	17.9	2.4	35.8	53.7
Mean	6.2	3.9	20.9	2.2	34.7	55.6
	Week 6					
5-6M-CRF	7.6	2.2	28.9	2.7	35.5	64.4
8-9M-CRF	7.4	2.0	27.0	2.8	37.8	64.8
WSF	7.8	1.5	19.2	2.7	34.6	53.8
Mean	7.6	1.9	25.0	2.7	36.0	61.0
	Total week 1, 2 and 3					
5-6M-CRF	17.1	4.9	28.6	5.8	33.9	62.5
8-9M-CRF	16.3	4.4	27.0	5.5	33.7	60.7
WSF	17.7	3.8	21.5	6.1	34.5	56.0
Mean	17.0	4.4	25.7	5.8	34.0	59.7

This suggests that using a hose to fertigate is not a sustainable method and results in substantial water and nutrient loss.

What can we do to be more sustainable in floriculture? There are other methods available such as "flooded floors", "ebb and flow", and "food troughs". These methods are rarely used as they are not affordable for many small and medium size growers. However, there are alternative creative effective methods available. One method is using saucers with a plastic hose with small holes at appropriate distances to water pots. Another method uses flats without holes and a small tube provides water to each flat. Both methods are controlled by a timer, inexpensive, and effective irrigation methods.


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Table 2. Nitrogen leached and lost when irrigating plants with water or fertilizer solution.

Treatment	N LEACHED (mg)			Total
	Wk 1	Wk 3	Wk 6	
5-6M	205.40	122.20	12.20	339.80
8-9M	156.60	106.60	9.80	273.00
WSF	153.10	149.60	13.20	315.90
	N LOST (mg)			
5-6M	24.70	7.00	2.10	33.80
8-9M	22.20	10.20	1.80	34.20
WSF	265.60	165.00	196.70	627.30
	N LEACHED + LOST (mg)			
5-6M	230.10	129.20	14.30	373.60
8-9M	178.80	116.80	11.60	307.20
WSF	418.70	314.60	209.90	943.20

Figure 1. Homemade, inexpensive irrigation systems; saucer and perforated hose; flats filled with fertilizer solution by a single tube.

