

WATER AND OTHER CULTURAL REQUIREMENTS OF DOMESTIC LANDSCAPE GARDENS IN KARACHI (SINDH)

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Water requirement.

I was asked to inspect a few home gardens in Karachi and suggest cultural practices. Most of these gardens cover an area of about 6,000-10,000 square feet or about 556 to 925 square meters. Neither the owners understand that water requirement in May can be 8 times that in January, nor do the Malis know. In summer plants usually get less water than needed and in winter more than the requirements. The first causes losses because of aridity or artificial drought and the second water logging. Both damage the roots. Water requirement is same as evapotranspiration and is about 65% of pan evaporation. A typical example is:

Area. 6,500 sq. ft.

Daily evaptranspiration May. 8 mm or about 1/3rd of an inch

Evapotranspiration from the whole lawn
of 6500 square feet or

$\frac{8 \times 6500}{25.4 \times 12} = 170$ cu.ft.

= 1061 gallons

or = 4,816 litres

or say About 5000 litres.

Monthly evapotranspiration in inches is as under:

- January. 1"
- February. 3"
- March. 4"
- 1st April to 15th April. 4"
- April 15th July 15th. 10"
- August 31st 6.5"
- September. 5.5"
- October. 4.5"
- November. 2.5"
- December. 1.5"

Daily water requirement in all months of the year will be as under:

Month	Quantity of water in Litres
January	500
February.	1500
March.	2000
April 1-5	2000
April 15 to July 15.	5000
July 15 to August 31.	3250
September.	2750
October.	2250
November.	1250
December.	750

Malis who sprinkle water from a hose pipe can never apply the exact quantity of water.

Impact Sprinkler System.

It is suggested that tank may have capacity of 5000 litres for pumping daily in summer or pumping 2 tank loads every second day. One can easily control the watering of 6500-10,000 square feet by 4 to 6 impact sprinklers. They make a beautiful scene too.

If chemicals are mixed with irrigation water dose may be applied with second tank and not the first. The 5000 litres tank will be about 170 cubic feet capacity or say 4.55 foot diameter and 7.0 feet long.

This tank cannot be put in the lawn. If a small tank is put, it has to be filled and emptied a number of times daily for exact measurement. A pressure pump and pressure tank is also needed with automatic timer to turn it off. These cannot operate from your over head tank as they need much higher pressure. Sprinkler system will be highly economical than engaging Malis. The system needs services of some good designer to create an economic balance between capital cost and recurring power costs. Automatic clock controlled impact sprinklers will be the best but for design, expertise is required.

Fertilizing and fertigation versus farm yard manure in organic farming.

Malis recommend farmyard manure. It is good, but quantity required for 6,500 square feet of landscape trees, grass, and flowers will be at least 6 tons of dry manure with only 15% moisture. However manure invariably contains weed seeds and lawn is always ruined. Malis pick these weeds by small tools but seeds can remain dormant in the lawn and can keep

germinating over 5-7 years. We have inspected many such lawns and gardens. Solution is to compost manure, a process which if handled daily and regularly by turning and adding some moisture to the pile will take three months. Organic agriculture is a fashion, but very difficult to execute. One can apply urea, triple phosphate and potassium sulphate by spray through sprinkler system and annual dose for 6500 square feet shall be 15 kgs of each. It would be advisable to apply 1.25 kgs of each every month or 31 grams of each every week. Weekly dose is better than fortnightly or monthly application. Manure contains micro nutrients. These can be applied four time a year by sprays. If impact sprinkler system is installed, it can be used for fertilising with irrigation, popularly called fertigation. Same system can be used for pest and disease control. Organic farming allows sprays of some fertilizers but not ground dose, as urea, phosphate and potash as well as micro-nutrients, when applied to ground kill soil fauna including earthworms, which renew the soil continuously.

Need for organic matter.

Organic matter is food for soil organisms, some useful insects and earthworms. It has to be applied to soil. This dry and dead matter is eaten by some insects which do not eat living green matter. These insects have their predators and those predators have their own predators. Their excrete, dead bodies, eggs etc., contain all macro and micro-nutrients and lie on surface of soil, to be swallowed by earthworms. Earthworms excrete one gram of casts a day and it contains all macro and micro-nutrients plus erthrymycine, terramycine and streptomycine, which protect living plants, against viral and fungal diseases. Organic matter to be applied to soil has to be composted. Lawn mowing make bulk of material, which can be composted, but for good compost of one cubic meter, about 1 kg Urea, 1 kgs phosphate, 1 kg potash and 1 kg micro nutrients is to be added and pile turned daily, some moisture added and in three months it forms good mulch. Its volume will be reduced to about 33 to 40%. It is an excellent fertiliser and can be stored in bags in a dry place for long time.

Sewerage waste as soil conditioner.

This is a good material but because of huge demand, one does not get the real material. Most of the time it is fake. Malis always tell the house-holds to put new soil. No new soil is needed. Your original soil 99% times is good. Do not lose it. It will be sold to another house hold as sewage sludge. One may be cheated. Composting farm yard manure or lawn mowing and other landscape waste one self can meet annual fertilizer and soil fertility requirements. Watering as per schedule and fertilizing can produce 5 tons of compost material annually from 6,500 square feet area, good enough for a year.

Landscape trees, fruit trees and shrubs.

There is tendency to put too many trees in the gardens. A tree would need at least 10x10 feet of area. If it is less it will not flower and fruit. This is invariably neglected with hope that many will be merrier. The fruits which can grow in cities of Sindh should be dwarf needing less place of

about 10x10 feet or less. There are dwarf and pink coloured mangoes and other fruits are longan (brother of lychee), papaya, guava, grape fruit, ber (zizyphus mauritiana and jujube), pink pomegranate, one variety of peach, coconut, atemoya (red colour sharifa), sharifa (Annona) or Sitaphal, many varieties of Annonas, and many others. Among nuts jojoba (oil nut) can grow in Karachi, and needs only 4x4 feet space. Some of above fruits like papaya will need 5x5 feet and guava, grapefruit, ber, pomegranate 6x6 feet, peach 8x8 feet. Annonas 6x6 feet and so on. They provide shade, reasonably beautiful flowers and fruit too is beautiful. Somehow the Malis do not know much about them and do not recommend it.

It is little realised that flowers and fruit on the tree which stays for some six months, can be more beautiful and colourful than flowers of some plants.

Disease control.

Many fruit trees are disease resistant. Many insects can be controlled by one summer and one winter spray of vegetable oils like mustard, neem and scores of other natural oils. Powdery mildew is controlled with caustic soda sprays. Since going organic is a desirable fashion, these methods can be tried, but Malis will bring you highly toxicant chlorophosphates some of them cancer agents and you have to be careful.

Nursery plants.

HEJ Centre in Karachi produces tissue cultured ornamentals in thousands. Cost is Rs.400-500. Malis buy a few of them, raise thousands of them in their nurseries from their cuttings and sell at very high rates, almost the same as HEJ plants. In big cities of Pakistan this is a lucrative business.

In the twenty first century, we have to be more modern and dynamic and will have to switch over to more modern practices and some amount of “Do it your-self” to escape exploitation at hands of all those in the trade.