Rotary District 9350 Food Gardens Webinar

Water for Sustainable Food Gardens



30 th June 21



WEBINAR AGENDA

1. Legal use of water for food gardens - Department of Water Affairs (Derril Daniels)

2. How to treat water with high iron content to make it suitable for Food Gardens – Friend of RC Atlantis (Bradley Chetty)

3. Growing vegetables in a way that releases the minimum carbon dioxide from the soil and minimises water usage - Friend of RC Swellendam (Pietie Uys)

4. Rainwater harvesting and how it affects the layout of a food garden – RC Helderberg Sunrise (Anton Lubbe)

5. Installation and cost of a borehole/well point for food gardens – RC Claremont (Andre Raath)

6. Closure – Geraldine



























- Existing lawful water use
- General Authorisation (GA)
 - General Authorisation with Notice Number 538
 of 2016, published in Government Gazette No.
 40243 on 2 September 2016
- Licence

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Schedule 1 explained

(1) A person may, subject to this Act -

	· · · · · · · · · · · · · · · · · · ·
(a) take water for reasonable domestic use in that	at person's household, directly from
any water resource to which that person has law	ful:access;
(b) take water for use on land owned or occupion (b) take water for use on land owned owned or occupion (b) take water for use owned o	ed by that person, for -
(i) reasonable domestic use;	
(ii) small gardening not for commercial purp	poses; and
(iii) the watering of animals (excluding feed	llots) which graze on that land within the
grazing capacity of that land, from any water	r resource which is situated on or
forms a boundary of that land, if the use is	s not excessive in relation to the
capacity of the water resource and the needs	s of other users.
Note: Schedule 1 water use within the urban ed	dge are normally supplied by the
Water Services Authority (WSP on behalf of the	e WSA). Those that does not get
water from a WSA / WSP that takes Schedule 1	water use within the urban edge
must comply with bylaws or any other ordinan	ce.
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- The water use:
 - The taking of water from a water resource.
- A water resource include a watercourse, surface water, estuary or an aquifer.







What does the GA allows

- Low impact water uses
- A person who has lawful access to a property or piece o land
- Depended on quaternary drainage area (i.e.
 150m³/ha/annum. A property size of 2 ha's can then use
 150 x 2 = 300 m³/annum) (volume abstracted per property)
- Limit of 10 m³ per day on average over a year of abstraction does not require registration (but should not exceed annual limit)
- Taking of more than 2l/s must measure (meter)
- Capping of 40 000 m³/ annum (Explained in next slide)

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Regulatory area

- No water may be taken within a:
 - 500 metre radius of boundary of a wetland, pan or estuary;
 - 100 metre radius of boundary of a watercourse or state dam;
 - 500 metre radius of state dam wall;
 - 500 metre high-water mark of the ocean without
 - an Water Use Licenced issued by DWS
 - One should also give effect to conditions of
 - Groundwater Control area...

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Does drilling (borehole or wellpoint) require permission?

- The drilling within the 1:100 year floodline or riparian habitat (which ever is greater) of a watercourse, yes;- then you require permission for drilling as it will trigger a section 21(i) water use.
- Depends on conditions of Groundwater
 Control Area Notice

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Section 21(a) of the NWA, 1998

- The water use:
 - The taking of water from a water resource.
- A water resource include a watercourse, surface water, estuary or an aquifer.









What does the GA allows

- Low impact water uses
- Lawful access to the resource
- Depended on quaternary drainage area (i.e. 2000m³/annum per property at a rate of 1litre/second)
- Limit of 50 m³ per day on average over a year of abstraction does not require registration (but taking of water should not exceed annual limit)
- Taking of more than 5I/s does must measure (meter)
- Surface water taken in terms of this GA on a piece of land or property may be used on another property or piece of land

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Questions





How to treat water with high iron content to make it suitable for Food Garden

Bradley Chetty







Water Quality from Borehole











Water for Agriculture and Human Consumption



The desirable range for irrigation **water** is 0 to 100 ppm calcium carbonate. Levels between 30 and 60 ppm are considered optimum for most plants. Irrigation **water** tests should always include both pH and alkalinity tests.

TDS in Water (measured in PPM)	Suitability for Drinking Water
Between 50-150	Excellent for drinking
150-250	Good
250-300	Fair
300-500	Poor, not good for drinking
Above 1200	Unacceptable







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Costing & Maintenance



With regards to the costing the following would be taken into consideration

- 1. Water Analysis (TDS, EC, PH)
- 2. Capacity per day
- 3. Site Planning

Maintenance of the unit is very low, a small tool box will be given with every project and training of the unit will take place. All parts are available locally and can be acquired from you local hardware or electrical store.

Capital Cost

- Each application is different, and hence we cannot give a general quote
- We have a current installation at Atlantis and work all the way through Africa
- Do have special rates for NGO's and NPO's













Vegetable Gardens can change a community!

Pietie Uys











SOIL

Keep the soil covered. (Mulch) **Continual Living roots. Minimize Disturbance. Increase Biodiversity. Soil Life (Mychro Biology)**





WATER **Catch it (Mulch)** Hold it (Organic Matter) **Slowly Release it** (Weeding) **Timing. Smart Planting.** Rainwater **Grey** Water





PLANTS







Compost







DOOR GARDEN







Rain Water Harvesting

Anton Lubbe





Rainwater Harvesting

- With rainwater harvesting from running away unutilised.
- There are two main strategies, which can be used together or separately:
- One, to store water in containers and/or tanks for later use; and
- ✓ Two, to get more water to soak into our soil, so that the soil gets wet deep down and can sustain plants for much longer. In other words, we are storing more water in the soil itself.





How can a household make best use of rainwater?

Simply by laying out the yard in such a way that water is...

- Intercepted (captured), then...
- Slowed down so that it doesn't flush away everything in its path, then...
- Channeled to where it is needed, and then...
- Stored for use, in two ways:
 i.Directly in the soil of the planting beds, and ii.In tanks, containers or dams.





Water from the roof

- The cleanest rainwater comes from the roof, and can be stored in tanks or drums
- The roof is cleaned at the start of the rainy season by the first rains. This is called 'first flush' and is not allowed to go into the storage tank
- Volume is m2 of roof area * annual rainfall figure (WC=853mm)



- Need 50mm/m2 per week, so if have a building of 8m by 30m (240m2) can provide water for a food garden of 160m2 for a year if you have enough storage
- Can be supplemented with greywater





Western Cape Model

Roof Area = 480m2Garden Beds = 400m2 **= 4*10 000** Rainfall =853mm pa Tanks

70,000 160 140 60.000 120 50,000 RAinfall (mm) 100 40,000 litres 80 30,000 60 20,000 40 10,000 20 0 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Axis Title Rain water from roofs into garden (I) Tank Water Buffer into Garden (I) Rain Water into garden (I) Additional water required ——Rainfall (mm) **Rotary Opens Opportunities** Rotary

DISTRICT 9350

Water Supply to food Garden

RUN-ON Water catchment system





 A trench (the top ditch) is dug across the runoff slope of the land to catch rainwater.
 Below the top ditch, the vegetable beds are dug 1 m deep and filled with organic matter – grass, leaves, manure, and ash – and mixed well with topsoil. These trench beds are fertile and absorb and retain moisture.

3. The trench beds are edged with ridges. Some are re-enforced with stone to stop the soil washing away and to reduce evaporation.

4. Between the trench beds a network of depressions (rainwater flowpaths) connect the top ditch to a second one at the bottom edge of the garden. The rainwater flows and pools in these channels/depressions during rain.

5. These rainwater flowpaths are also the footpaths to access the trench beds.

6. In the rainwater flowpaths the gradient is flat so that the water has more time to soak into the trench beds.

7. If it rains too much, the **bottom ditch** is breached to avoid flooding of the trench beds.

10. Fruit trees are planted along the lower edge of a ditch so that their deep roots

can benefit from the extra soaking.



Runon system with Trench beds



Installation and cost of a borehole/well point for food gardens

Andre Raath





Potential Water Sources for Food Gardens



Boreholes

How:	Look for geological markers that indicate that groundwater may be present. Use experts in this science
When:	Boreholes and wellpoints can be installed at any time, but prices are lowest in wet seasons
Where:	Suitable locations in the garden area but ensure that it is safe and waterproof
Why:	To supplement other water capture systems such as rainwater harvesting
Who:	Anyone can install a borehole or wellpoint but registration is required
Cost:	Depends on the depth but budget for R50 000 at a minimum
Help from:	Both local and national government (Department of Agriculture) may assist to one degree or another. Policy still in development
Notes:	Gift of the Givers advised that they are also an NGO and cannot provide borehole assistance to food garden projects





Points to Note

Boreholes should not be the primary source of water for the following reasons:

- Groundwater generally has a high mineral content such as iron and manganese which may be toxic to plants and animals
- Aquifers are a finite resource which take centuries to regenerate
- Drawing water from the ground can create weaknesses in the ground structure and cause sinkholes
- Use a one third two thirds combination of groundwater to harvested water but test before applying to crops
- Don't use harvested or groundwater for cooking or drinking. High mineral content and carrion contamination are health risks
- Look for geological markers that indicate that groundwater may be present. Use experts in this science





Questions

D9350 Website Home Page | Rotary District 9350 (rotary9350.co.za)





Closure

Geraldine Nicol



