



Growing in an protected part of the  
soil:  
Mtumwbi system  
GVA Iringa



Why growing in an isolated part of the soil and not in open field of substrate?

- Goal to use only local available materials for this system.
- Goal to build this system with our own team.
- Stable, simple, strong and the lowest risks on failure's
- Cheap and simple to disinfect.
- Usage of all kind of fertilizers are possible (organic, broadcast fertilizers, gypsum, slow release and water soluble).
- Lowest cost price per m<sup>2</sup> greenhouse (€ 1,24/m<sup>2</sup>)





Before they can install the Mtumbwi we check the slope/drain, we have an slope of 3%, means on 20 meter 60 cm different.

We have the drain at the end, we can close the Mtumbwi to bring up the plastic.

Drain water goes to the bassin, reuse only with 1 day overnight with 5 ppm calciumchlorite, till today we use it at the openfield.



After the slope/drain is inline, we add at the bottom an we add an layer of ground cover quality 160gr/m<sup>2</sup>, after this the plastic 200 micron.

On this plastic we add pebbles  
(4.5m<sup>3</sup>/1.000m<sup>2</sup>/39 rows)

On top of this the the normal soil, silty loam,  
25% clay.





Block 5: closing pollinating 21

August, goal 35 fruits by 0,3  
gr/fruit per plant.







| NH4  | K    | Na   | Ca   | Mg   | NO3   | Cl   | SO4  | H2PO4 | H    | Si   | Fe    | Mn    | Zn   | B     | Cu   | Mo   |
|------|------|------|------|------|-------|------|------|-------|------|------|-------|-------|------|-------|------|------|
| 1,25 | 8,88 | 0,00 | 4,85 | 1,21 | 18,30 | 0,00 | 1,10 | 1,75  | 0,00 | 0,00 | 45,00 | 10,00 | 5,00 | 37,50 | 0,75 | 0,50 |

  

| A-tank (1x)           |          | B-tank (1x)                  |         |
|-----------------------|----------|------------------------------|---------|
| Calcium Nitrate sol   | 10,5 kg  | Multi-MKP sol                | 2,4 kg  |
| Potassium Nitrate sol | 0,5 kg   | Magnesium Sulphate sol       | 2,4 kg  |
| Magnesium Nitrate sol | 0,6 kg   | Potassium Nitrate sol        | 6,7 kg  |
| Fe-DTPA 6% sol        | 421 gram | Manganese Sulphate 32.5% sol | 17 gram |
|                       |          | Zinc Sulphate 24% sol        | 13 gram |
|                       |          | Borax sol                    | 36 gram |
|                       |          | Copper Sulphate 25% sol      | 2 gram  |
|                       |          | Sodium Molybdate 40% sol     | 1 gram  |

Every 2 weeks YARA Winner, and we drip only 1.5 EC with the recipe above.



Only disinfection is with an hard chemical, it don't can effect the environment (closed system).

Spray to fungal is by Copper.

Tuta we control by traps, see below, and we found out that the black dam liner + molasse spray on this collect even more than the traps.

Once in the 2 weeks we drip Bionematon (Osho), to ensure we don't get an infection of nematode.







Dutch: mangement full by female.

Right Anna Mbodze (Kooome = Kenya), left Anna Mrosa Tanzania).

They shows germination test.

