



REPORT ON SAMPLE OF GARDEN SOIL

FILE NO : 121190299

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NARRE WARREN SOUTH PRIMARY SCHOOL
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REFERENCE : STEPHANIE ALEX.
REFERENCE PHONE : 03 8415 1993
DATE RECEIVED : 8/11/2012
ANALYSIS REQUIRED : Full (ST-1)

SAMPLE ID : S.A.K.G.

DEPTH OF SAMPLE (cm): STOCKPILE

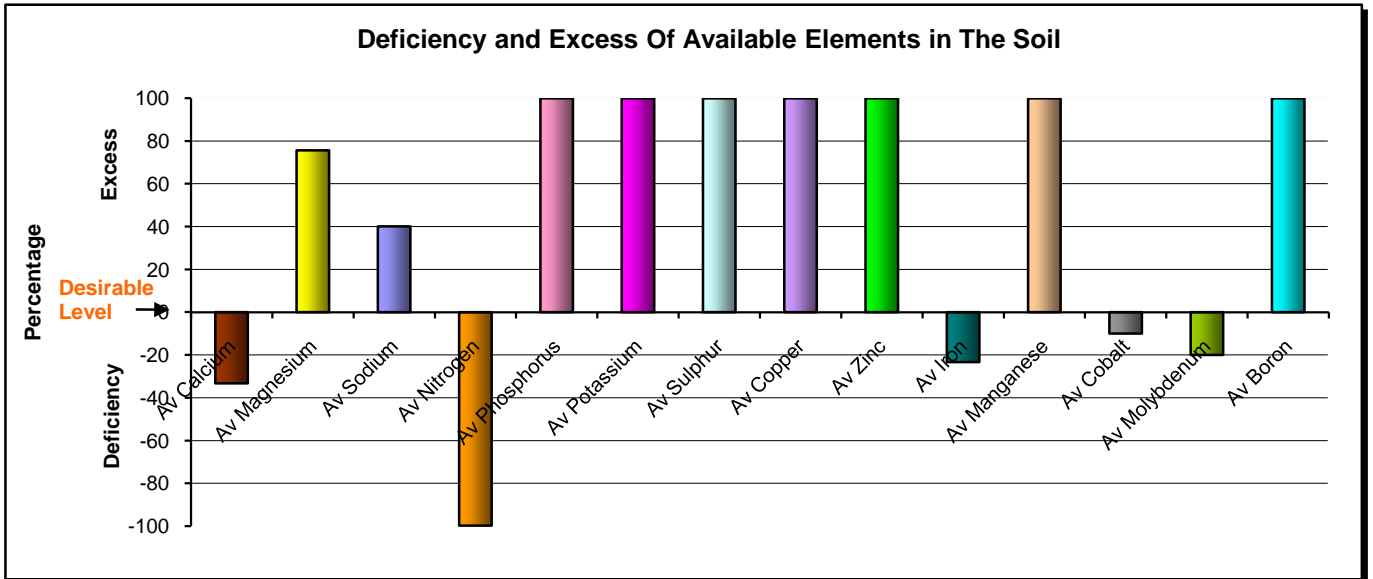
| ITEMS | RESULTS | DESIRABLE LEVEL | | |
|----------------------------------|---------------|-----------------|----------------|--------------------|
| | | LEAF VEGETABLE | ROOT VEGETABLE | FRUITING VEGETABLE |
| pH(1:5 Water) | 7.3 | 6.0-7.0 | 5.0-6.5 | 5.5-7.5 |
| pH(1:5 0.01M CaCl ₂) | 6.8 | | | |
| Electrical Conductivity | EC μS/cm | < 470 | < 470 | < 470 |
| TOTAL SOLUBLE SALT | TSS ppm | < 1551 | < 1551 | < 1551 |
| AVAILABLE CALCIUM | Ca ppm | 6170 | 6170 | 6170 |
| AVAILABLE MAGNESIUM | Mg ppm | 817 | 817 | 817 |
| AVAILABLE SODIUM | Na ppm | < 522 | < 522 | < 522 |
| | | | | |
| AVAILABLE NITROGEN | N ppm | 160 | 180 | 180 |
| AVAILABLE PHOSPHORUS | P ppm | 80 | 200 | 100 |
| AVAILABLE POTASSIUM | K ppm | 380 | 380 | 380 |
| AVAILABLE SULPHUR | S ppm | 16 - 20 | 16 - 20 | 16 - 20 |
| | | | | |
| AVAILABLE COPPER | Cu ppm | 4 | 4 | 4 |
| AVAILABLE ZINC | Zn ppm | 7 | 7 | 7 |
| AVAILABLE IRON | Fe ppm | > 30 | > 30 | > 30 |
| AVAILABLE MANGANESE | Mn ppm | > 20 | > 20 | > 20 |
| AVAILABLE COBALT | Co ppm | > 1.0 | > 1.0 | > 1.0 |
| AVAILABLE MOLYBDENUM | Mo ppm | > 0.5 | > 0.5 | > 0.5 |
| AVAILABLE BORON | B ppm | 1.0-2.0 | 1.0-2.0 | 1.0-2.0 |
| TOTAL ORGANIC MATTER | OM % | > 10 | > 10 | > 10 |
| TOTAL ORGANIC CARBON | OC % | > 5 | > 5 | > 5 |

| ITEMS | | | RESULTS | DESIRABLE LEVEL |
|----------------------------|---------|------------------|---------|-----------------|
| EXCHANGEABLE CALCIUM | Ca | meq/100g of soil | 15.41 | 22.09 |
| EXCHANGEABLE MAGNESIUM | Mg | meq/100g of soil | 8.96 | 5.10 |
| EXCHANGEABLE SODIUM | Na | meq/100g of soil | 2.38 | < 1.70 |
| EXCHANGEABLE POTASSIUM | K | meq/100g of soil | 7.23 | 1.70 |
| EXCHANGEABLE HYDROGEN | H | meq/100g of soil | 5 | |
| ADJ. EXCHANG. HYDROGEN | H | meq/100g of soil | 0 | < 5.10 |
| CATION EXCHANGE CAPACITY | CEC | meq/100 of soil | 38.98 | |
| ADJUSTED CEC | Adj.CEC | meq/100 of soil | 33.98 | |
| EXCH. SODIUM PERCENTAGE | ESP | | 6.11 | < 5 |
| CALCIUM / MAGNESIUM RATIO | Ca/Mg | | 1.72 | 2 - 4 |
| BASE SATURATION PERCENTAGE | BSP | | 90 | |

| ITEMS | | PERCENTAGE OF ADJUSTI | DESIRABLE LEVEL |
|------------------------|----|-----------------------|-----------------|
| EXCHANGEABLE CALCIUM | Ca | 45.4 | 65-70% |
| EXCHANGEABLE MAGNESIUM | Mg | 26.4 | 12-15% |
| EXCHANGEABLE SODIUM | Na | 7 | 0.5-5% |
| EXCHANGEABLE POTASSIUM | K | 21.3 | 3-5% |
| EXCHANGEABLE HYDROGEN | H | 0 | <20% |

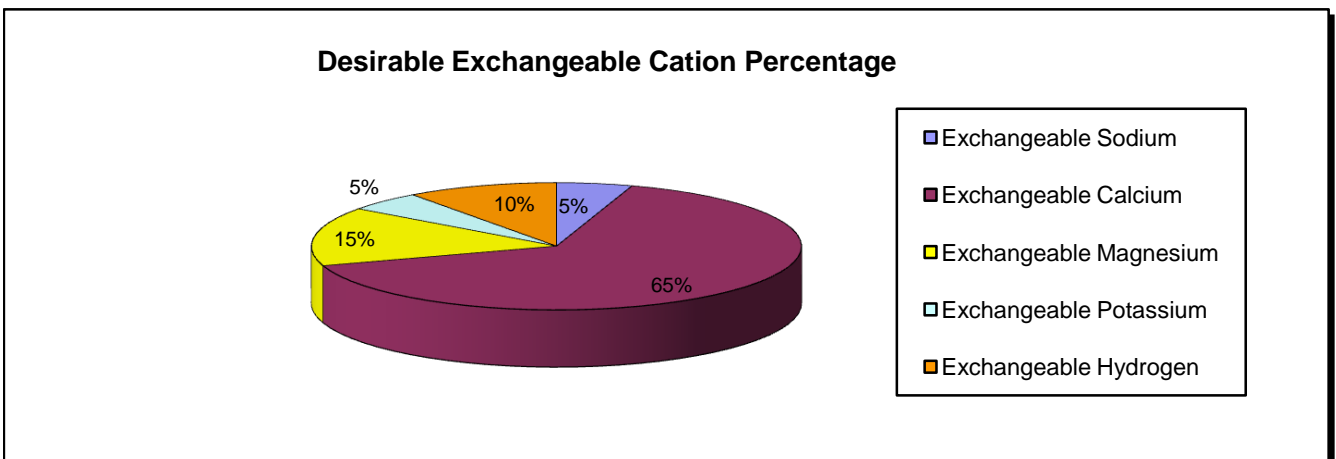
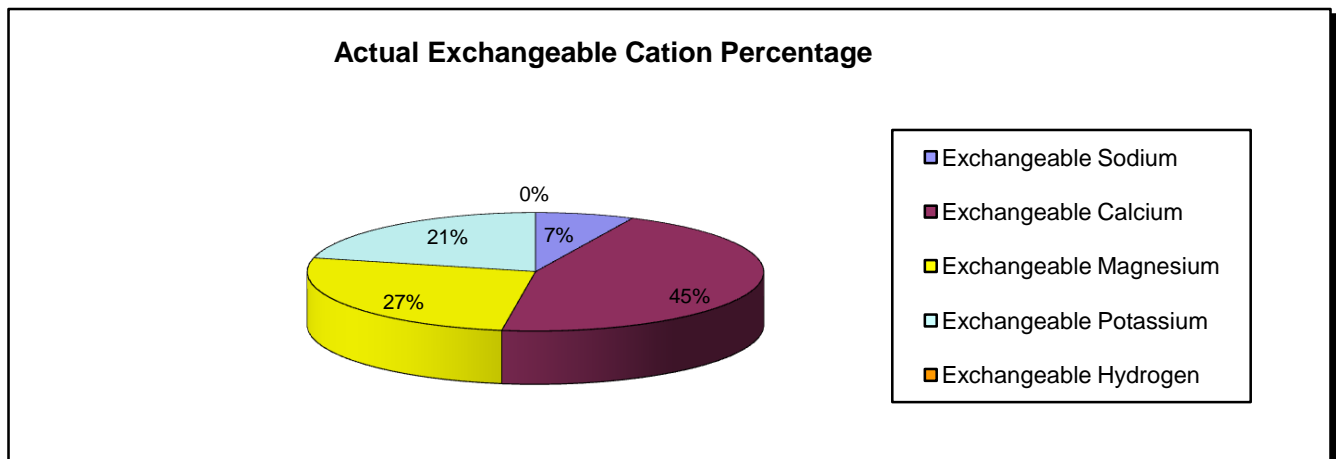
| PREVIOUS APPLICATIONS (IF APPLICABLE) | | DATE OF APPLICATION |
|--|------------------|---------------------|
| GYPSUM APPLIED | g/m ² | |
| LIME APPLIED | g/m ² | |
| DOLOMITE APPLIED | g/m ² | |
| Magnesium Sulphate | g/m ² | |

CEC = Cation Exchange Capacity



Notes:

- Phosphorus fixation effects if Iron is more than 300 ppm
- Manganese will be at toxicity level if it reaches 500 ppm



RECOMMENDATION

| | |
|-------------------------------------|------------------------------|
| GYPSUM REQUIREMENT | 1340 g/m ² |
| LIME REQUIREMENT | 0 g/m ² |
| DOLOMITE REQUIREMENT | 0 g/m ² |
| MAGNESIUM SULPHATE (Epsom Salts) | 0 g/m ² |

| TOTAL FERTILIZER REQUIREMENT (g/m ²) | Nitrogen | Phosphorus | Potassium | Sulphur |
|--|-----------|------------|-----------|----------|
| LEAF VEGETABLE | 16 | 0 | 0 | 0 |
| ROOT VEGETABLE | 18 | 0 | 0 | 0 |
| FRUITING VEGETABLE | 18 | 0 | 0 | 0 |

| | LEAF VEGETABLE | ROOT VEGETABLE | FRUITING VEGETABLE | |
|------|----------------|----------------|--------------------|-------------------------------|
| WITH | COPPER | 0 | 0 | 0 g/m ² |
| | ZINC | 0 | 0 | 0 g/m ² |
| | COBALT | 0.002 | 0.002 | 0.002 g/m ² |
| | MOLYBDENUM | 0.005 | 0.005 | 0.005 g/m ² |
| | IRON | 0.35 | 0.35 | 0.35 g/m ² |
| | MANGANESE | 0 | 0 | 0 g/m ² |
| | BORON | 0 | 0 | 0 g/m ² |

IT IS IMPORTANT TO READ THE NOTES BELOW AND ON PAGE 5 AS THEY FORM PART OF THESE RECOMMENDATIONS

NOTES :

- Gypsum Requirement is to increase the Calcium and Sulphur and decrease the Exchangeable Sodium and or the Exchangeable Magnesium in the soil. For best results, use only 'A-grade' Gypsum.

Desirable levels for Exchangeable Cations (Ca, Mg, Na, K and H) is directly related to the constant desirable level percentages (see pie graph page 3) and the soil's Adjusted CEC. The other elements vary in relation to the soil's CEC, landuse, leaching requirement and yield.

If soil pH (water) is below 5.7, trace elements should not be applied until Lime and/or Dolomite applications have had time to raise the pH to this level. For soils with pH (water) of 8.0 or more, apply trace elements as foliar spray only.

The recommendations for Gypsum/Lime/Dolomite/MgSO₄ on page 4 are essential to the process of achieving optimum soil balance. All other recommendations in this report (NPKS & trace elements) have been formulated on the assumption that the Gypsum/Lime/Dolomite/MgSO₄ have been applied and given sufficient time for their effects to develop. In most cases, six months will be required between application of cation balance correction and fertilisers, however, more time may be required in lower rainfall zones or dry seasons. In areas with shallow saline watertables and NO subsurface drainage, no Gypsum should be applied (even if recommended here) until adequate drainage can be provided. It should also be noted that the amounts recommended depend, in part, on the stated sample depth.

For all required materials - Gypsum/Lime/Dolomite/Magnesium Sulphate/Magnesium Oxide (where surface application is necessary and irrigation is not available), the total application should be limited to roughly 2.5 t/ha per year. This limitation does not apply where materials can be cultivated or irrigated into the soil.

Important note: For all reports that have landuse as "Pasture". If molybdenum is needed to be applied, then copper needs to be applied as well even if available copper is high. Copper and molybdenum are antagonistic to each other so if molybdenum is applied without copper, molybdenum will deplete copper leading to copper deficiency in animals. The main problem occurs when animals graze treated pasture soon after application. For this reason, if you are worried about applying copper when there is enough in your soil, you can apply molybdenum alone BUT you MUST keep animals off the pasture for at least 6 weeks (longer if there has been little or no rain).

SWEP does not recommend or promote specific products, so all recommendations are given in kg/ha of actual nutrient. These must be converted into applications of fertiliser. For assistance in doing this, consult your local supplier.

ANALYTICAL METHODS

| Items | Methods |
|--|--|
| pH (1:5 Water) | 4A1 |
| pH (1:5 CaCl ₂) | 4B1 |
| Electrical conductivity (1:5 Water) | 3A1 |
| Total Soluble Salts | Calculation from Electrical conductivity |
| Exchangeable Calcium, Magnesium, Sodium, Potassium | 15D3 or 15A1 |
| Exchangeable Hydrogen | Barium Chloride-Triethanolamine method* |
| Available Nitrogen | Calcium Chloride-Brucine method (colorimetric) |
| Available Phosphorus | Olsen extractable, 9C1 |
| Available Sulphur | KCl 40, 10D1 |
| Available Copper, Zinc, & Cobalt | EDTA, 12B1 |
| Available Molybdenum | Ammonium Oxalate-Oxalic acid-di-iso propyl ether |
| Available Iron & Manganese | method of E.H. Mikhail (1981) |
| Available Boron | 12C2 |
| Total Organic Matter | modified Walkley & Black, 6A1 |
| Total Phosphorus, Calcium, Magnesium | Acid digestion |
| Extractable Aluminium | 15G1 |
| Total Nitrogen | Dumas method, 7A5 |
| Chloride | 5A1 |
| Available Silica | Dithionite-Citrate method** |

NB. For available Iron and Manganese, SWEP uses the method developed by E.H. Mikhail (1980) due to the tendency for the standard EDTA method to produce erroneously high results.

For numbered test methods:

Rayment, G.E. & Lyons, D.J. (2011). Soil Chemical Methods - Australasia. CSIRO Publishing, 150 Oxford Street, Collingwood Vic 3066, Australia.

*Peech, M., Cowan, R.L. & Baker, J.H. (1962). Soil Science Society American Procedures, A critical study of the Barium chloride-Triethanolamine and ammonium acetate methods for determining exchangeable Hydrogen of soils.

** Ross, G.J. & Wang, C. (1993). Soil Sampling and Methods of Analysis, CRC Press, Boca Raton, Florida, USA.