

# The Basics.

## *Good Gardening Begins With The Soil.*

Perth has one of the most nutrient poor soils of any major city in the world. To successfully grow most exotic plants, on-going soil improvement is required.

### **About Perth Soils**

#### **Perth's soils are;**

- Naturally low in nutrients and organic matter. This means our soils have little ability to hold the nutrients required for healthy plant growth. And have little ability to retain moisture.
- Predominantly free draining sands.
- Usually limey or alkaline in pH, anywhere below the Darling Scarp and getting progressively more limey as you go closer to the coast.
- Often water repellent. Making it difficult for precious irrigation water to penetrate.

### **What We Recommend**

*As soil improvement is such a key part of successful gardening in Perth, it's vital that you recommend Dawson's Soil Improver to our customers.*

Please always offer and recommend soil improver to customers when they are buying plants.

*Adding organic materials like soil improver to the soil are immensely beneficial to plant growth because;*

- It helps increase soil fertility and promotes a healthy soil environment (encourages worms and the soil micro flora growth).
- Increases the soil's ability to hold nutrients and water.
- Allows for easier water penetration.

- Modifies the pH of limey soils making them less limey. This is particularly important for acid soil lovers like Camellias and Azaleas.
- Greatly increases the chances of successful establishment of plants.

## **How Much Is Enough?**

**O.K, so soil improvement is a pretty good idea, but how much do you use?**

Provided Dawson's Soil Improver is blended in with the existing soil there is virtually no chance of over-doing it, but as a rule of thumb the following amounts are a reasonable guide:

- One bag of soil Improver, is enough to plant three 175mm pot plants.
- for larger plants and acid loving plants use more, e.g. at least half a bag or more per plant.
- for advanced trees use 3-4 bags per tree.
- for preparing the ground for vegetables or flower seedlings, at least one bag per square metre.

***Blending: Dawson's Soil Improver, is designed to be dug into the soil and blended with the existing garden soil. The recommended rate to blend soil improver with soil is 1 part Soil Improver to 2 parts existing soil.***

# Soil pH

## What is pH?

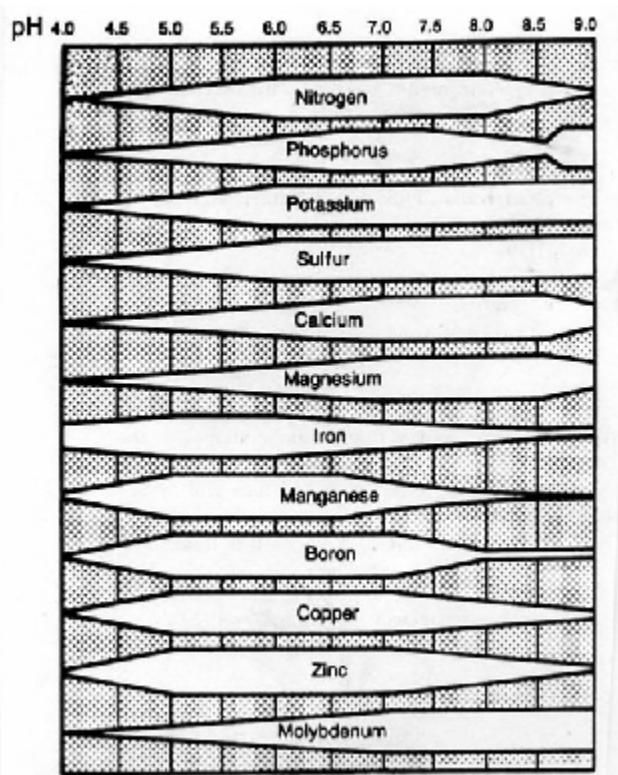
*pH is a measure of the relative acidity or alkalinity of a soil.* pH itself is short for potential **H**ydrogen ions. pH is measured on a scale of 1 to 14 with 7 being neutral. The higher the pH value the more limey or alkaline a soil is eg pH 8-14; while the lower the pH value the more acidic a soil is eg pH values of 6-1 are acidic.

## What Are The Implications of pH on Perth Soils?

In Perth most of our soils on the coastal plain (below the Darling Scarp) are alkaline or limey, due to the presence of limestone which is rich in the element calcium. The majority of coastal soils are strongly alkaline.

The importance of pH on the health of plants, is that the level of pH will affect the relative availability of nutrients to plants. As you can see from the table of pH and nutrient availability (see below), you'll see that in Perth's alkaline soils the availability of the elements of Iron, Manganese, Zinc, Copper and Boron, really start to decline drastically as pH rises from about 7.5 upwards.

**Effect of Soil pH on Nutrient Availability**



(Table above from Growing Media For Ornamental Plants and Turf, by Handreck and Black).

The relative un-availability of the elements of iron and manganese in particular, cause a lot of the problems encountered by Perth gardeners. For example the chlorosis or yellowing of leaves in plants like Gardenias, Citrus and Azaleas and Camellias (usually caused by iron deficiency) and the “frizzle top” condition seen in palms when the fronds develop in a distorted fashion (caused by manganese deficiency).

Some plants have very specific pH requirements and will only grow successfully in soil within a certain pH range. **In Perth, because of our alkaline soils we have difficulty growing acid loving plants like Camellias and Azaleas. These plants grow best in slightly acidic to neutral soils. Therefore to grow these plants successfully in Perth’s limey sands it’s essential to improve the planting soil with the addition of generous amounts of acidic materials like Dawson’s Organic Soil Improver, peat and pine fines. Mulching with pine bark will also assist acidifying the soil.**

The majority of ornamental plants are tolerant to soil pH within a range of slightly acidic to slightly alkaline values. However many exotic plants will start to display varying degrees of nutrient deficiency symptoms once pH of soil increases above pH 8 and upwards.

## **How do we acidify alkaline soils?**

**In Perth the most important thing to do when combating alkaline soils, is soil improvement at planting time and the subsequent mulching of the soil.** Adding ample amounts of organic materials such as Soil Improvers, pine fines, peat, compost and animal manures will all assist to acidify the soil. To improve alkaline soils is an on going process requiring on going mulching and addition of organic materials, but is well worth while. Building a healthy and balanced soil, is always the key. *A healthy soil rich in organic matter will be less alkaline and plants grown in good improved soils will be healthier and less likely to suffer from nutrient deficiencies.* **Healthy Soil, Happy Healthy Plants!**

## **Diagnosing Problems Caused By Limey Soils and Nutrient Deficiencies.**

When customers bring in leaf samples that are yellow or are describing yellowing or chlorotic leaves, more than likely you’re onto a alkaline soil induced problem and usually a nutrient deficiency. **The unavailability of nutrients in alkaline soils, accounts for many of the problems experienced by Perth gardeners.**

**In trying to solve these problems you need to work through these steps;**

- 1) Quiz the customer what sort of soil preparation have you done before planting?, Do you mulch? etc, if the answer is nothing or not much, more than likely the plant could be suffering from poor soil and limestone induced problems.

- 2) Ask them where do they live? The closer you get to the coast the more limey the soil will be and the more likely alkaline soil induced nutrient deficiencies will be displayed.
- 3) Ask them if they water by bore? Bore water is often limey, sometimes contributing to problems.
- 4) Look at the leaf symptoms of samples the customer gives you. Yellowing will often indicate “lime induced chlorosis”, put simply a problem caused by limey soils. The pattern of chlorosis might also give you a clue as to what particular element is deficient.
- 5) A pH test kit is available at all stores for you to use. This is really very accurate and will give you a good picture of what the customer’s soil is like, so its easier to recommend solutions.

**Where established plants display nutrient deficiencies (due to alkaline soils) there are a few things we can do to improve the situation.**

- 1) If plants are relatively small and can still be lifted. Remove plant and add organic matter to the soil (eg Dawson Soil Improver) and replant.
- 2) For established plants displaying nutrient deficiencies. Add soil improver and try to cultivate into top 5cm of soil and mulch (use acidic type mulches, eg pine bark). Add corrective elements as required.
- 3) Sulphur can be used to lower the pH of alkaline soils. However it is only useful where pH is only mildly alkaline eg up to a PH of about 8.5. Soils with a pH above 8.5 usually contain high levels of limestone which would require excessive applications of Sulphur. Note in highly alkaline soils changing the pH by renovating the soil with organic matter is really the only option. Where pH is 8.5 or below, sulphur can be applied at a rate of 25-50g per square metre. This will be enough to lower the pH of the top 10cm of soil by 1 pH unit eg, 8.5 to 7.5.

## **Treating Specific Nutrient Deficiencies Caused by Limey Soil.**

**Iron deficiency:** Very common in Perth Soils. **Symptoms include: Interveinal yellowing (Veins stay green, whilst the rest of the leaf goes yellow).** In severe cases they may even start to go white. Affects a wide range of plants including, Azaleas, Camellias, Gardenias, Hibiscus, Roses, Citrus and fruit trees. Symptoms appear first in youngest leaves. Treat iron deficiency with a soil drench around the drip- line of the affected plant, with Iron Chelate (at recommended rate).

**Manganese deficiency: Irregular interveinal yellowing and yellow flushes. Veins stay green but are pale green.** Fairly common particularly on Citrus trees. Treat with complete trace elements of Manganese Sulphate at recommended rate.

**Magnesium deficiency: Older leaves have yellow margins or a yellow tip. The yellow tip often appears as a characteristic V type pattern with a roughly “V” shaped yellow discolouration extending into the leaf from the tip.** Sometimes seen on Gardenias, grapes and citrus. Treat with Magnesium Sulphate at recommended rate.

**General trace element deficiency:** Apply granulated or soluble Complete Trace Elements.

**Organic liquid feeds, like Seasol are also useful as they contain trace elements, so are a good tonic for sick plants.**

## *The Magic of Mulch*

*Mulching is one of the easiest and most beneficial of gardening practices.*

Applying a layer of coarse mulch between 5-10cm thick over the soil surface, can reduce soil water loss through evaporation by a staggering 70%. Mulching has many other benefits:

- Cools the soil surface improving plant growth.
- Breaks down over time, improving soil and feeding plants.
- Encouraged worms and soil microbial activity.
- Suppresses weed growth, reduced soil erosion and looks attractive.

### *What makes a good mulch?*

Good mulches have large irregular shaped and sized particles. This type of mulch allows water to penetrate quickly through it to the soil below and absorbs little water on the way through. ***Products sold by Dawson’s like the Water wise Pine Bark Mulch are excellent mulching products to recommend.***

### *How To Apply Mulch.*

Apply mulch to a depth of 5-10cm thick over the soil and top up as required.

**Remember don’t mulch right up the trunks of plants ( as this can cause collar rot!). Leave a mulch free area around the trunk of each plant.**

# Soil Wetting Agents

## Getting The Water In!

Many Perth soils are slightly water repellent in nature. This means that precious irrigation water runs off the surface and doesn't penetrate the soil deeply. Soil Wetters can help here. These materials when applied to the soil, allow water to penetrate quickly and deeply. Soil Wetters are available in a liquid concentrate form that is mixed with water for application and a granular form which is simply sprinkled over the ground and watered in.

### Water Holding Granules or Crystals:

These are absorbent materials, which retain moisture, creating a reservoir of water for plant roots to tap into. These products are useful for sprinkling into the soil at planting time, placing beneath roll turf, incorporating into new or established beds and adding to potting mix. Always apply at recommended rates.



#### FORRESTFIELD

160 Hale Road  
Ph 94536533  
Fax 94539520

#### SWANBOURNE

153 Railway Street  
Ph 93849652  
Fax 93832108

#### O'CONNOR

388 South Street  
Ph 93147258  
Fax 93147264

#### JOONDALUP

Cnr Joondalup Drv  
& Cord St  
Ph 93000733  
Fax 93001244

[www.dawsonsgardenworld.com.au](http://www.dawsonsgardenworld.com.au)