

A photograph of yellow Plumeria flowers in bloom, set against a clear blue sky. The flowers are the central focus, with some in sharp focus and others slightly blurred in the background. The overall tone is bright and sunny.

Plumeria

Just Surviving or Thriving

By Jim McKibben

Polynesia: Sharks and Plumeria (Frangipani)



Plumeria



To **thrive**: basic requirements

- Soil



- Water



- Fertilizer



Sun 6+ hours of full sun per day



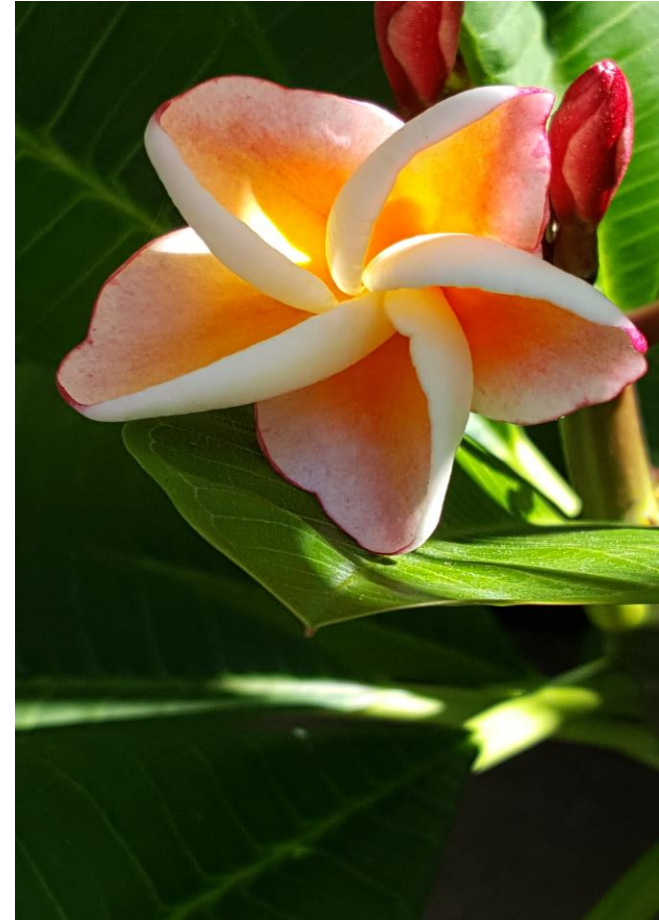
"To thrive, Plumeria must have the proper pH"

Quote from Tex Norwood, FCN

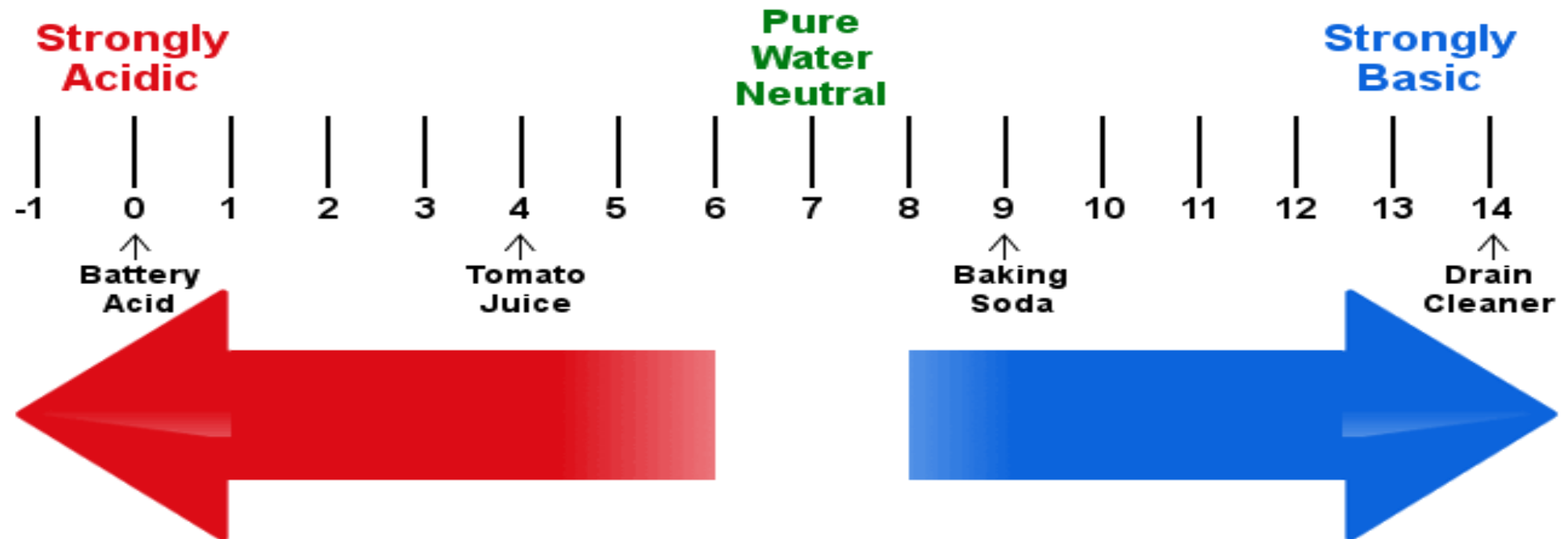
Ideal range **6.3-6.7**

tolerance range **6.0-7.3**

Outside of this range your Plumeria
may be struggling to survive



Basics of pH



pH stands for "potential Hydrogen"

The pH scale is a reverse logarithmic scale, meaning each whole value is 10 times the whole value next to it.

A pH of 5 is ten times more acidic than a pH of 6.

A pH of 5 is 100 times more acidic than a pH of 7.

A pH of 10 is ten times more basic than a pH of 9.

Acids often have a sour taste, like lemons.

Bases often have a bitter taste, like soap.

Many things, like bat guano, act as pH buffers. This means the pH cannot change too easily.

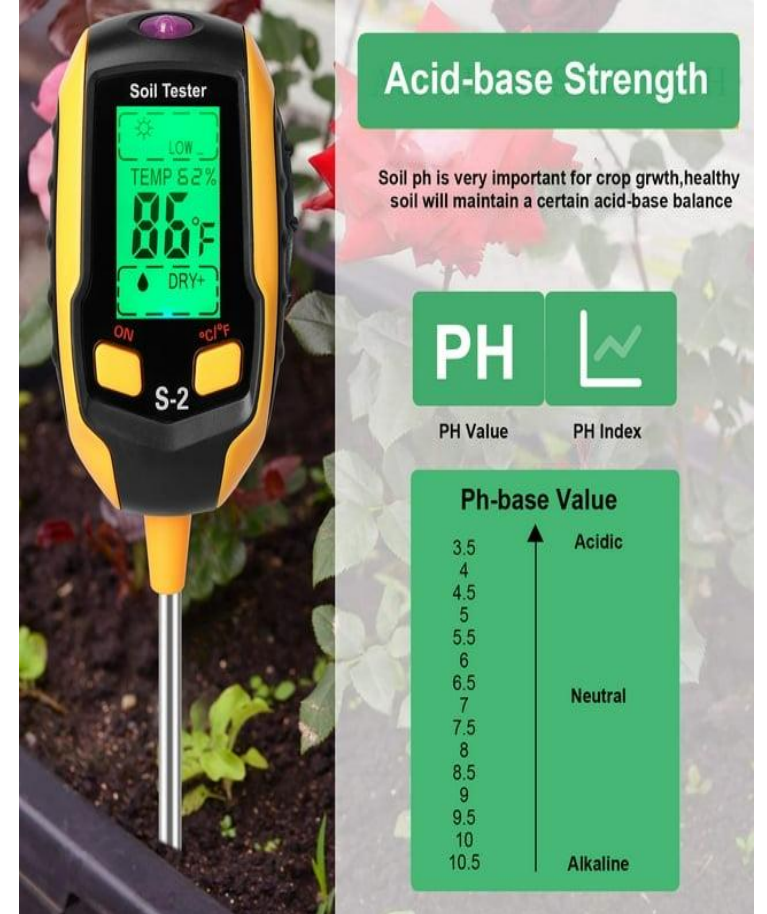
pH test methods



Least Accurate



Moderate



Most Accurate

pH meters



Soil Tester

LOW

TEMP 52%

86°F

DRY+

ON °C/°F

S-2

Acid-base Strength

Soil ph is very important for crop grwth,healthy soil will maintain a certain acid-base balance

PH

PH Value PH Index

Ph-base Value

3.5 ↑ Acidic

4

4.5

5

5.5

6

6.5

7 Neutral

7.5

8

8.5

9

9.5

10

10.5 Alkaline

The image shows a digital soil tester with a black and yellow body, labeled "Soil Tester" and "S-2". The LCD screen displays "LOW", "TEMP 52%", "86°F", and "DRY+". The device is inserted into a garden bed. To the right is a green informational overlay with a white border. It contains the title "Acid-base Strength", a paragraph about soil pH, two icons labeled "PH" and "PH Index", and a vertical scale for "Ph-base Value" ranging from 3.5 (Acidic) to 10.5 (Alkaline), with 7 labeled as "Neutral".

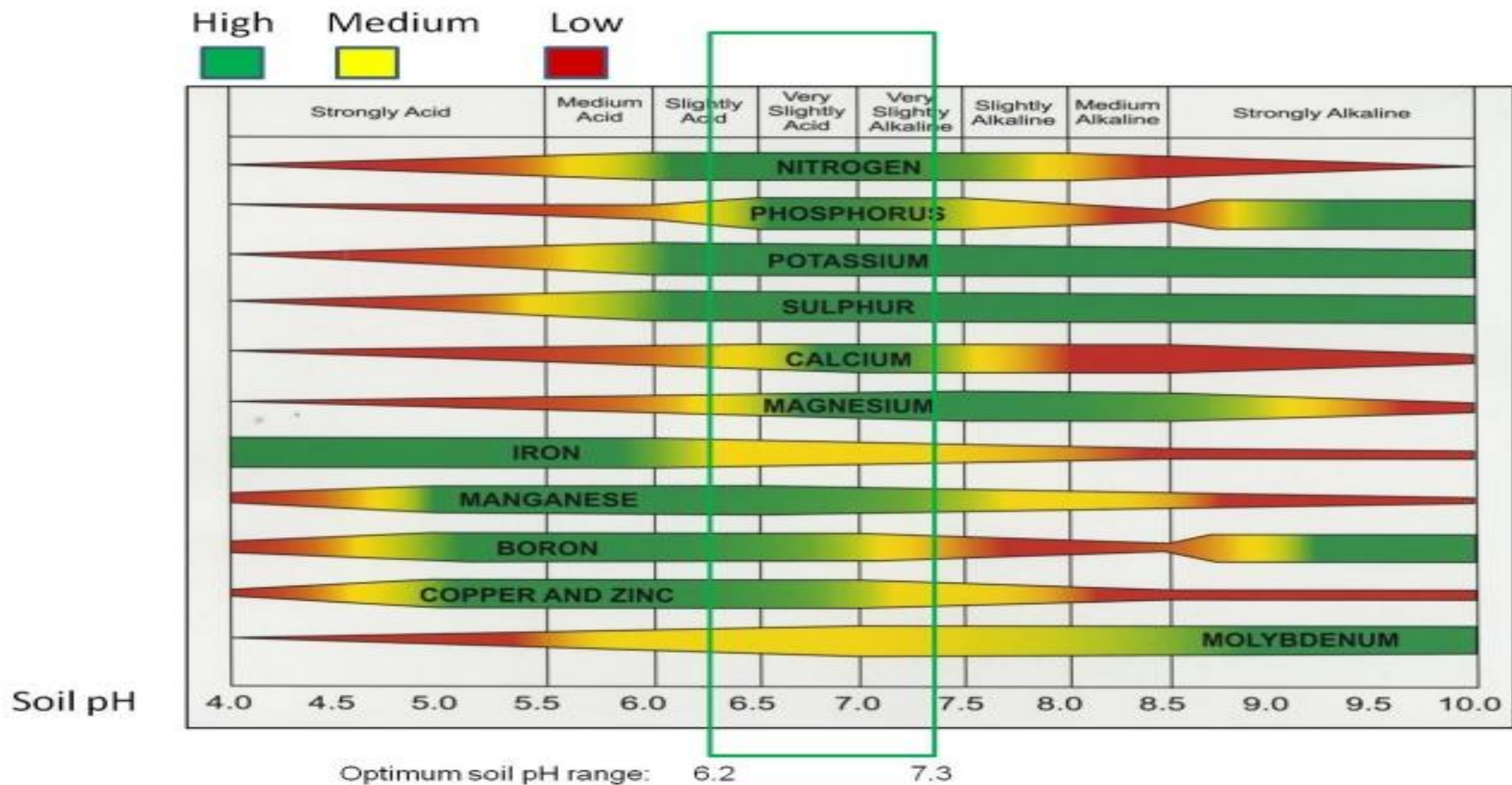
Plus many other models

Meter calibration

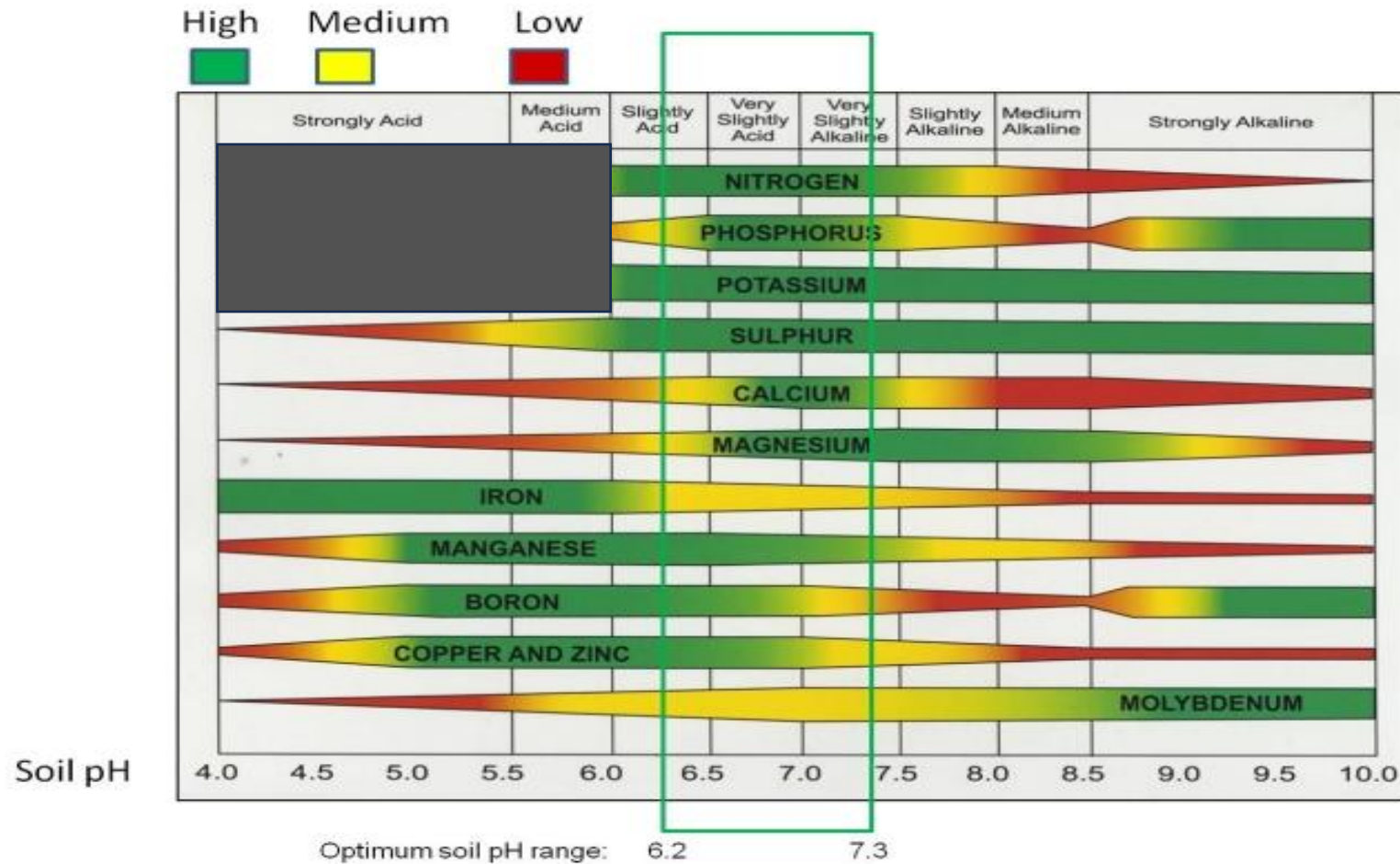
- pH meters do require occasional calibration to assure their accuracy



How soil pH affects availability of plant nutrients

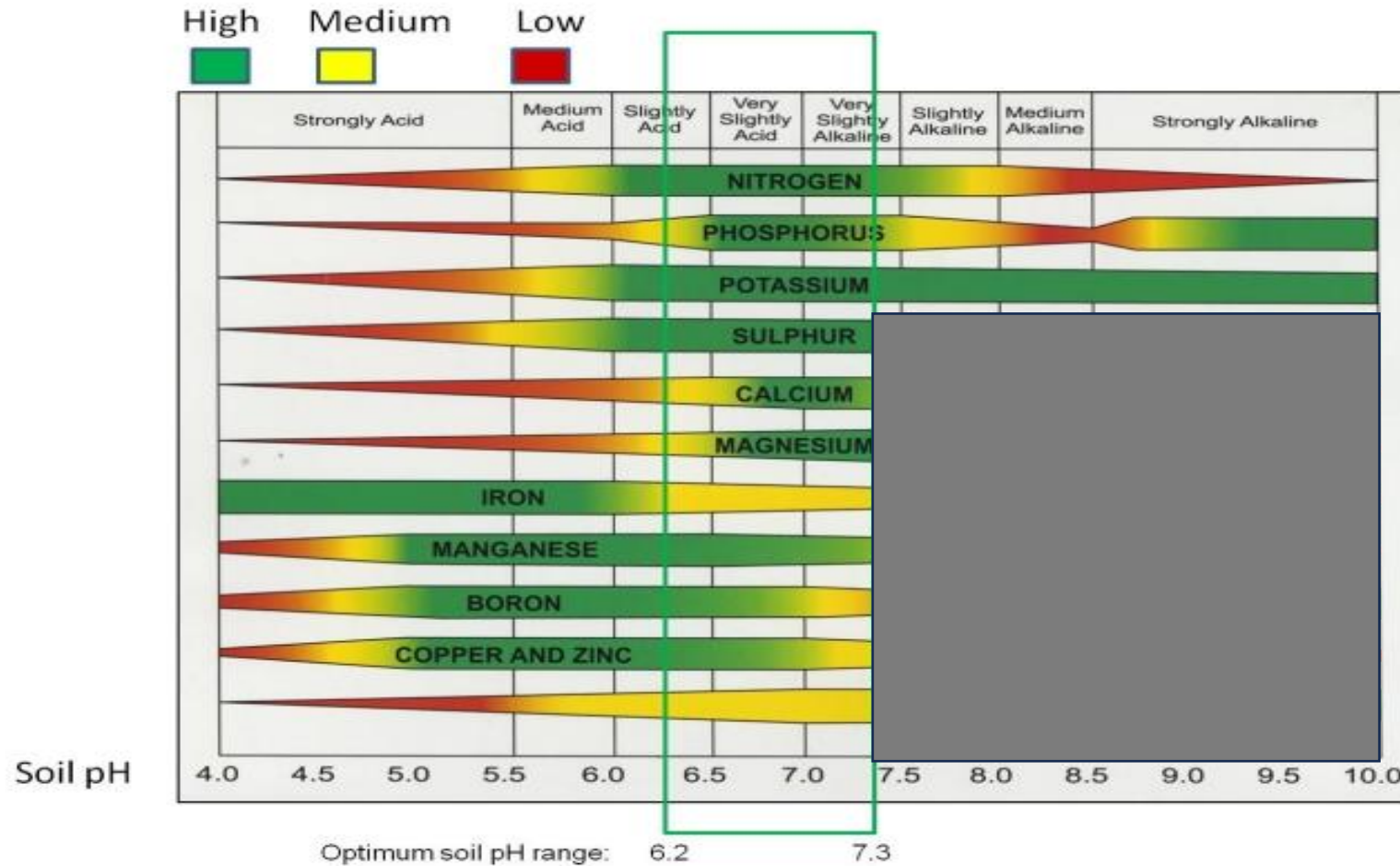


How soil pH affects availability of plant nutrients



pH too low (below 6.0) reduces absorption of Macronutrients N,P,K
Nitrogen (N), Phosphorus (P), Potassium (K)

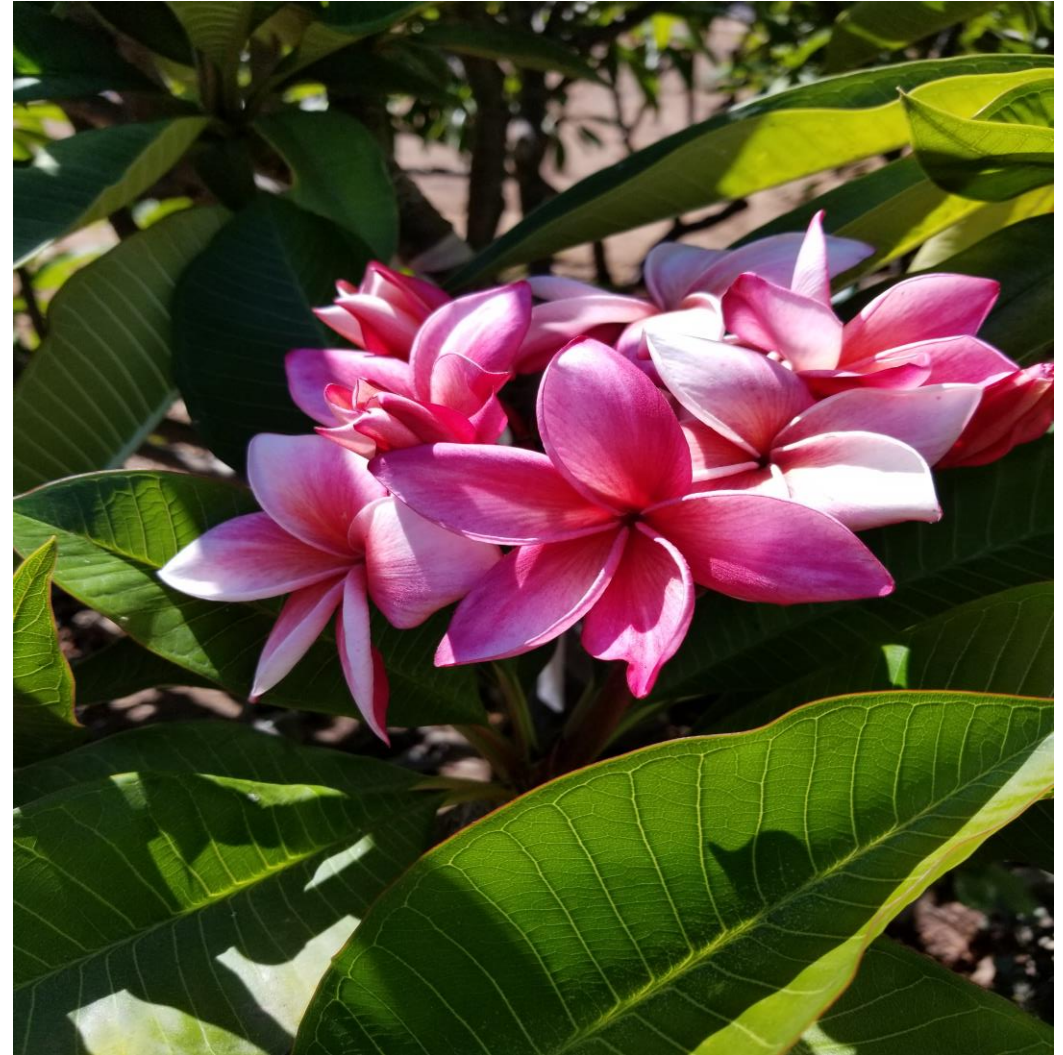
How soil pH affects availability of plant nutrients



pH too high (above 7.3) reduces absorption of Micronutrients including Sulphur (S), Calcium (Ca), Magnesium (Mg)

Only in the narrow pH range of 6.0-7.3 will Plumeria truly thrive

- Lush dark green foliage
- Abundant Flowering
 - Potentially increased seed pod production
- Disease resistance
- Increased resistance to insects



Soils pH range 6.0-7.3



Cactus soil mixes include some or all of the following:

Forest products-aged fir, bark, etc.

Coir-from coconut husks

Canadian peat moss

Perlite-a mixture of coarse /fine perlite

Pumice

Manure-composted cow /chicken manures

Dolomite /oyster lime-for pH balance

Sand-green agricultural sand

Bat guano

Feather meal

Lava rock

Kelp meal

Worm castings

Soil additives to adjust pH

Lowers pH

Doesn't alter pH

Raises pH

Sulphur

Perlite

Dolomite Lime

(lighter-breaks down with time)

Garden Lime

Ammonium sulphate

Pumice

Gypsum

(heavier in weight- doesn't breakdown)

Aluminum sulphate

Bat Guano

***Compost (pH 5.5-8.0)**

*** use with caution:
can cause rapid pH change**

***Peat moss (pH 4.5-5.5) *Coffee grounds (pH 4.6-8.4)**

Water pH

- Rainwater



- pH= 6.03

Distilled



pH=7.0

Tap water



pH=range 6.5-8.5

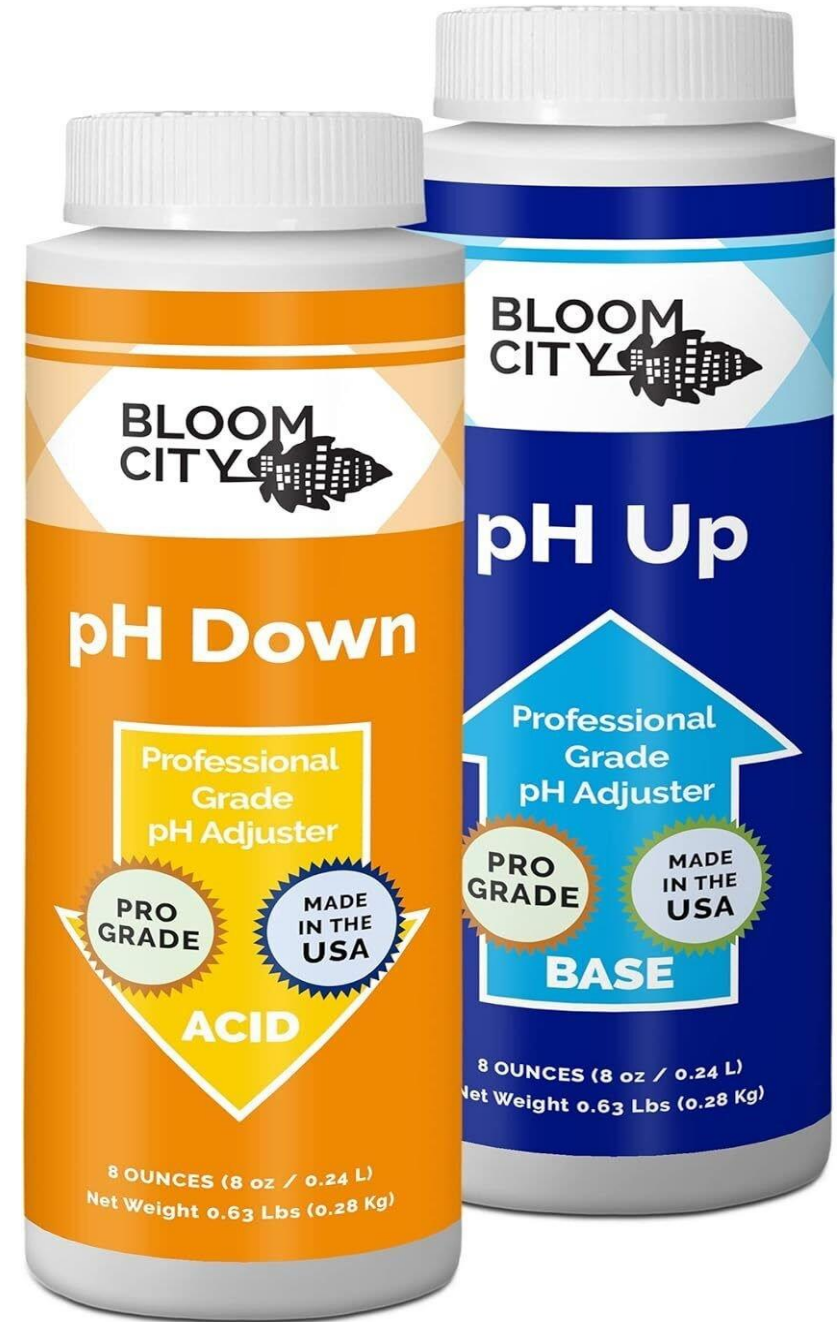
Tap water sources (pH 6.5-8.5)

Data from State Water Resources Control Board

- Tap water in Southern California comes from 3 primary sources:
- Northern California (via the California Aqueduct)
- Colorado River
- Ground water (pumped from regional aquifers)

Adjusting water pH

- Measure pH
- Slowly add pH Up or Down to reach correct pH
- A very small amount will cause a big change



Fertilizers and Additives

Excaliber VI (11-11-14) & IX (11-11-13)

Growmore 7-7-7

Hawaiian Bud and Bloom

Nelsons Plumeria Fertilizer

Seaweed emulsion

Spray-and-Grow

Best 6-24-24 XB+

Osmocote / Osmocote Plus

Azomite (natural mineral fertilizer with trace minerals)

Bat Guano

Compost

Fish Emulsion

Manure (composted cow/chicken droppings)

Worm castings

Mycorrhizae Fungi

Many others

Use a **balanced fertilizer**

Choose a balanced fertilizer

16-16-16 or **20-20-20**

Potential damage of super high Phosphorus (middle number) fertilizer

i.e. Hawaiian Bud and Bloom 5-50-17

Longterm use of high phosphorus fertilizers can stress your plants

Bat Guano: *Plumeria* super food



Bat guano is rich in Macro and Micronutrients
contains the three essential nutrients:

nitrogen (N) 7%, phosphorus (P) 3%, and potassium (K) 1%

Nitrogen promotes strong vegetative growth.

Phosphorus for vigorous flower production and rapid root growth.

Potassium develops strong trunks and branches.

Bat guano is a pH buffer (helps stabilize the soil pH)

Contains beneficial: Mycorrhizae Fungi, beneficial enzymes, and micronutrients.

A little goes a long way especially when rooting new cuttings



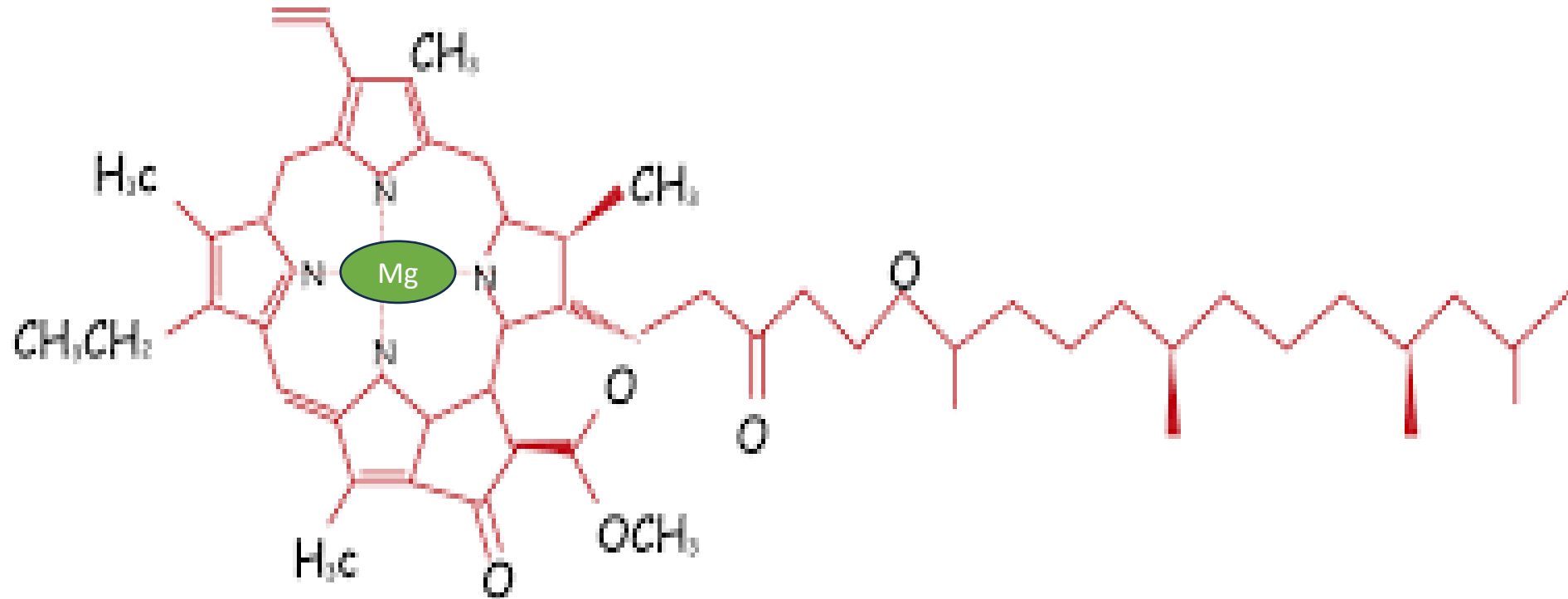
Importance of Magnesium

- **Epsom Salts** (Magnesium Sulphate) Mg 9.6%, S 13%
- **Sul-Po- Mag** (Sulfur-Potassium-Magnesium) S 22%, K 21.5%, Mg 10.8%
- Benefits: without adequate amounts of magnesium the plumeria cannot produce Chlorophyll
- Activates enzymes that promote healthy growth
- Strengthens cell walls in seeds, improves germination
- Improves proteins in plants, leading to improved plant vigor

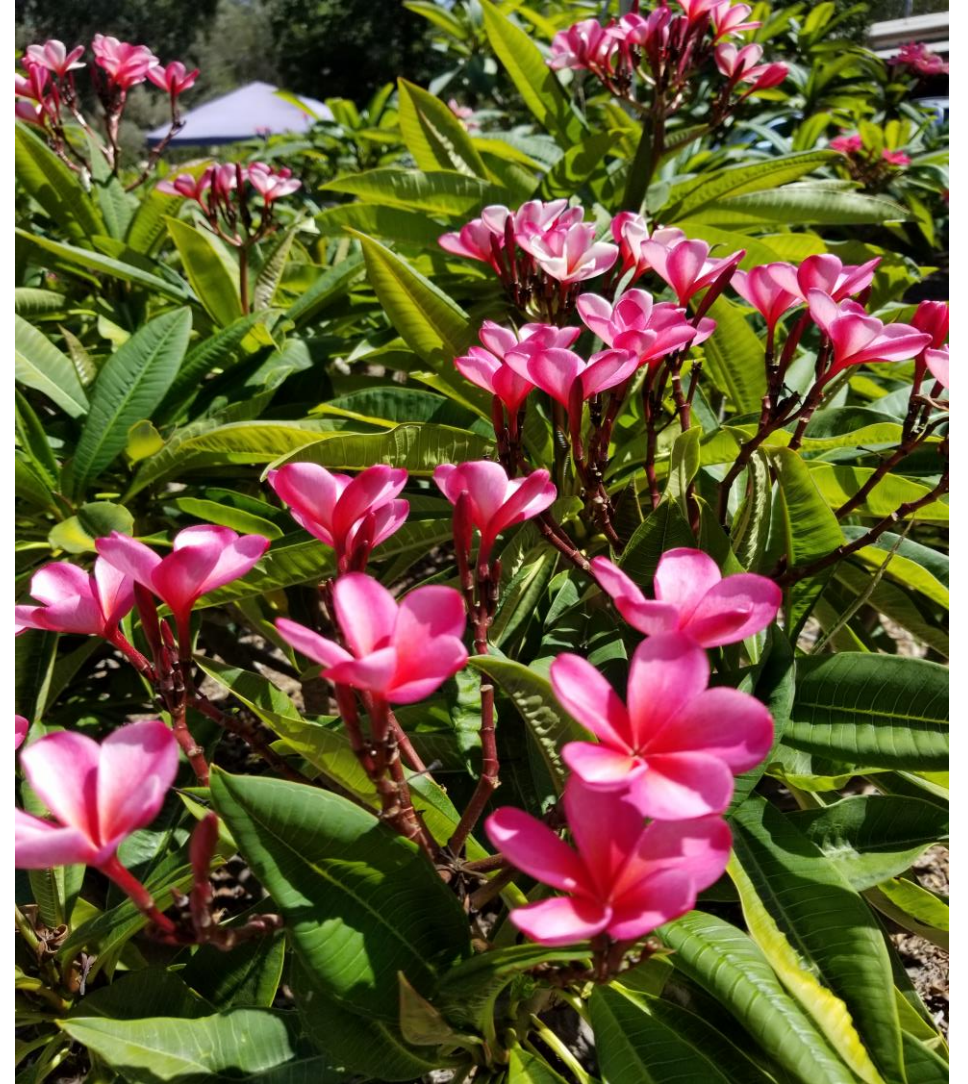
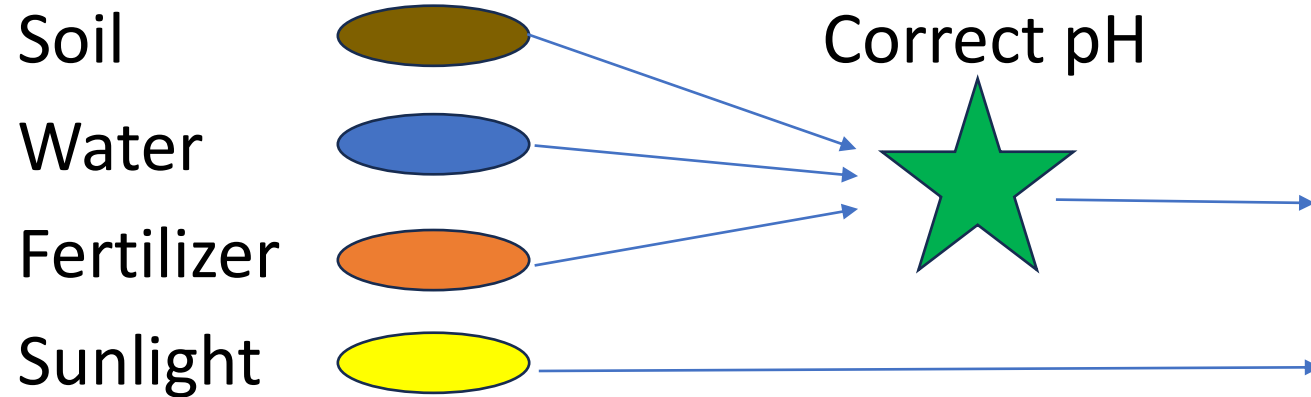
Magnesium in Chlorophyll

Chlorophyll-

a pigment, present in all green plants , responsible for the absorption of light to provide energy for photosynthesis.



With the proper pH in all three components plus adequate sunlight your plumeria will **thrive!**



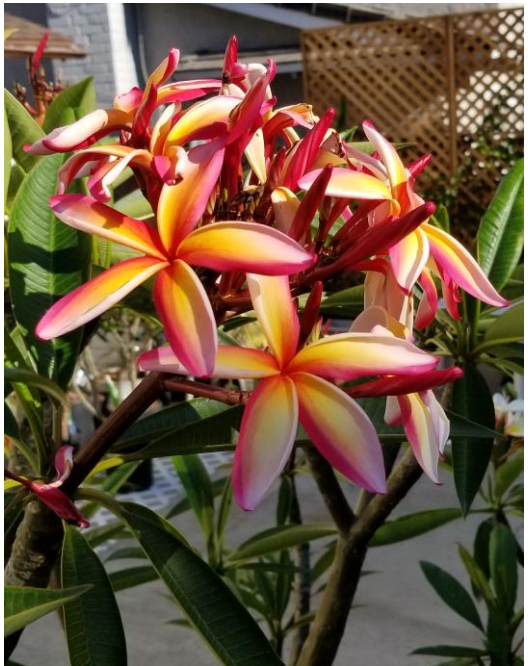
It's **Biology** (ok, **Botany**, if you must)

- If you buy a new healthy Plumeria, and it starts looking poorly in a few weeks –**Suspect** a water related problem, either overwatering or **pH**.

Be patient!

- Biological processes take time-days to weeks before you will see a change. Some changes may take a full season to be seen.
- Don't make drastic changes in pH. Allow the plant to acclimate to a small pH change, then make the next change.

The results will be worth the effort!







Mahalo

