

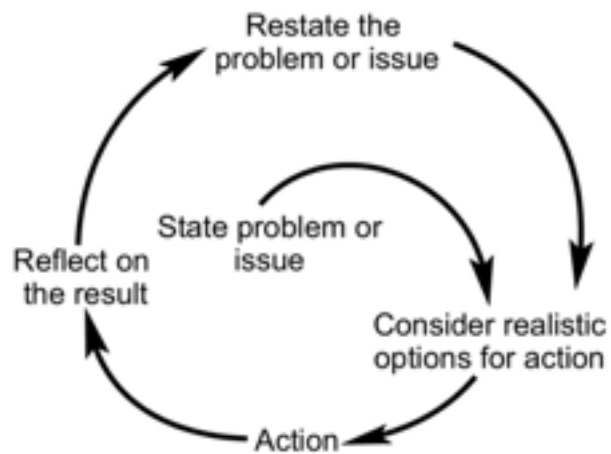
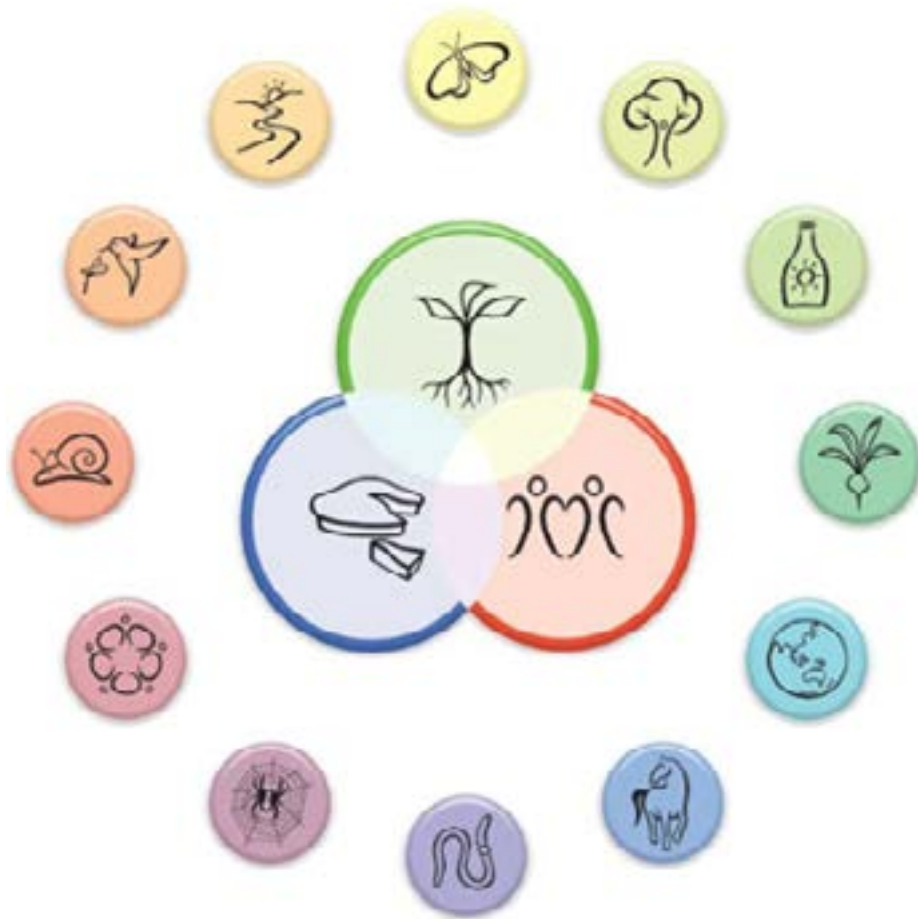


## PERMACULTURE COURSE 1 of 2020

### Principle 2: Catch & Apply Energy

*The following points summarise my current understandings about the role of mineral balances in optimising fertility.*

- The level and balance of mineral nutrients are two important but different measures. Both are necessary to understand and maintain fertility.
- Bioregional and soil-type patterns of mineral imbalance are important, but intensive use of land, especially gardening, can create quite different imbalances.
- In the ideal balanced soil, the full range of crops that can be grown in the climate will be productive, healthy and produce good-quality food.
- Although wild and indigenous plants are adapted to particular imbalances, all will do well in a balanced soil.
- The most important soil mineral balance to get right is that between the alkaline mineral nutrients of calcium, magnesium, potassium and sodium.
- The ideal soil has the following balance by percentage base saturation: 38 calcium 68%, magnesium 12%, potassium 2-5% and sodium <1%.
- Measuring the acidity or pH balance is of some use but can be very misleading. A balanced soil has a pH of approximately 6.5 but a pH of 6.5 does not necessarily indicate a balanced soil.
- In clay soils, the balance between calcium and magnesium is the most powerful factor in determining how friable and open the soil is to air and water, as well as the ability of the soil to store water, carbon and nutrients. These factors in turn control biological productivity, ease of management, and resistance to erosion and degradation.
- The balance between calcium and potassium is the strongest soil factor in determining how lush or woody vegetation will be.
- When calcium is relatively high, herbaceous vegetation will tend to be soft, lush, palatable to animals, and broken down rapidly to humus by bacteria. Fruits tend to be sweet and long keeping.
- When potassium is relatively high, herbaceous plants are fibrous and less palatable to animals, resist breakdown, and fungal decay dominates over bacterial. Fruits tend to be more acid and do not keep as well; woody plants do well and wood is more durable; forest litter tends to accumulate as dry fuel rather than rot.
- Organic matter and composts made in different ways and with different ingredients vary greatly in their quality as sources of soil fertility. Organic materials produced from a balanced system will maintain that system in balance if carefully recycled. Recycling within an unbalanced system will be successful to varying degrees, dependent on the nature and severity of the underlying imbalances.
- Fertilising programs to maintain balance are quite different from those necessary to establish balance. Just because a soil fertiliser (organic, rock mineral or artificial) produces a good result does not mean that more will produce a better result.



1. State a problem, issue or challenge
2. Consider realistic options
3. Best option into action
4. Observe results
5. Reflect on what has been learnt
6. Restate the problem, challenge or issue as it now is and start a new phase of learning.