

## A BRIEF GUIDE TO ALL YOU NEED TO KNOW TO GROW

**BIODYNAMICS** A farm or garden in which all the nutrients it produces are recycled needs very little extra input from outside. Composting all available organic wastes and returning them to the soil creates resource loops which maintain the biomass in the system. In this way, the soil is maintained in a high state of fertility and is more active or dynamic.

**COMPOSTING** The decomposition and reconstitution of organic matter includes all four elemental processes; Heating = Fire, Breathing = Air, Moisture retention = Water, Humus formation = Earth. The essential factor is the bonding of Carbon- and Nitrogen-containing molecules, which requires a balanced initial mixture of ingredients, in a ratio of 30 to 1 (10 to 1 at end of process).

**ORGANISMS** Healthy, well-fed soil has an awesome capacity for supporting life. A spoonful of healthy topsoil contains billions of micro-organisms [bacteria etc.]. Earthworms can create many tonnes of fertilising casts per acre each year. The presence of abundant micro- and macro-organisms not only encourages healthy plant growth but also limits the spread of pests / diseases.

**RAISED BEDS** A strip of soil 4-8 ft/ 1-2 m wide is edged with beams or planks of wood 6-12 inches/ 15-30 cm high to make a stable bed. Soil from paths can be dug out onto the beds to allow access and prevent cultivated soil from being compacted by footsteps. This helps to create a soil which is well-structured, easier to work, holds moisture with good drainage and aeration.

**MULCHING** Mulches protect the topsoil around maturing plants from weathering by sun, wind and rain. They provide a buffer at the interface between the soil and the atmosphere, keeping the soil moist in dry weather or warm in cold weather, allowing root-systems and soil organisms to remain active for longer.

**GREEN MANURES** Ground-cover crops are a living mulch which can prepare land for the crop to follow. They suppress weed growth and can either be dug in to improve soil-structure or raked away for use in compost or as mulch.

**COMPANION PLANTING** Neighbouring plants of different species and growth patterns can have a beneficial influence on each other. Herb companions improve vegetable flavour and protect crops from pests. Two crops can symbiotically benefit from growing next to or amongst each other, if they require similar soil cultivation but make different demands on the space available at different times. In Permaculture systems, combinations of companions suitable for a particular site create a self-sustaining plant community.

**CROP ROTATION** Monoculture of the same crop on the same piece of land for many years depletes the soil of the nutrients which that crop requires and increases the chances of pests and diseases building up. A sequence of different crops allows the soil longer to recover before the same demands are repeated. Compost or manure only needs to be added once every three years for heavy feeders [potatoes or cabbage] if they are followed by soil-improvers [peas, beans, grains] and lastly light-feeders [roots] that need a well-consolidated soil

**PLANT CARE** Liquid feeds and foliar sprays with readily available nutrients can be made by fermenting any green plant material, [especially comfrey for potash and nettles for nitrogen] or manures in rainwater for 2-4 weeks, stirring occasionally. Teas made of infused herbs can be sprayed onto plants either to strengthen new growth [such as horsetail] or to discourage pests [such as quassia]. Biodynamic preparations containing homeopathic doses of quartz, cow-dung, valerian, chamomile, dandelion and oakbark can be sprayed onto plants, soil or compost to enhance a variety of growth processes.

**CYCLIC SYNCHRONICITY** Plants are influenced by daily cycles of expansion by day and contraction at night and also by annual cycles of seasonally changing day-length, both depending on the position of the sun relative to the earth. The lunar cycle also influences the activity levels and life-cycles of plants and soil-organisms, peaking around full moon. Plants are even affected by planetary transits. We can synchronise our actions with these daily, monthly and annual cycles by understanding and observing how they influence growth.

## **OBSERVATIONS**

Many factors influence plant growth. We need to observe and understand these seasonal influences to be able to assist in these processes and avoid disrupting them. An awareness of daily and seasonal changes allows us to intervene only when our actions will be effective. A strategy of minimal intervention saves time and effort, and produces great results. So try to regularly put your thinking cap on, relax and use the passive, receptive side of your brain to assess how these observable factors can help you grow plants where and when they will thrive.

## **SOLAR ENERGY**

The amount of sunlight available to plants varies according to day length and season. Plants need to both expand by day and contract at night. The relative length of light and dark periods determines when seeds will germinate and when plants will flower and mature. In the spring and autumn, these periods are equal allowing relatively constant growth. In summer, sunlight is more intense, direct and almost vertical, which can be too bright, hot and dry for some plants. Equally in the winter, sunlight is weaker and less direct, casting long shadows, which can be too dark cold and wet for many plants to keep growing.

## **TEMPERATURE**

The air temperature usually [but not necessarily] reaches a maximum by day and falls to a minimum at night. It is affected by wind which can either be cooling or warming. Cold air is heavier than warm and so sinks down slopes which causes frost pockets in dips and valleys. The temperature of the soil slowly changes with the seasons, with an average delay of six weeks behind the ambient air temperature heated directly by the sun. At a certain depth, below 6 inches/ 15 cm, the temperature of the soil remains within a fairly constant range [2-4 degrees C] throughout the year. Darker soils warm up earlier in the year. Some plants have anti-freeze mechanisms which increase the concentration of glucose in their sap and allow them to continue to grow in sub-zero temperatures and others can even generate enough heat to protect themselves from mild frost. Soil organisms can also generate warmth [exothermic reactions], given the right conditions, as illustrated by the heat achieved in active compost or manure heaps.

## **CLOUD**

Clouds reduce the intensity of light reaching plants, but many can grow quite happily with only indirect sunlight. If it's

cloudy enough, the cloud-cover actually insulates the air beneath it, which usually prevents frost at night. By regular observation, you can recognise what weather different shapes and sizes of cloud-systems will bring. You can study the unique pattern that your local geography produces in the cloudscape, which allows you to time your actions precisely. If you know your clouds, it should be possible to sow seed just before it rains.

## **PRECIPITATION**

Water is vital for plants, especially in these times of drought. Rainwater is preferable to tap water, so you should try to store as much as possible in butts and tanks. You can also store a lot of moisture in the soil if it contains sufficient humus [over 5%], which acts like a sponge, soaking up and retaining up to ten times its weight in water. You can also conserve moisture in the soil by either hoeing or mulching directly after a downpour. Remember that a layer of snow forms an insulating blanket which actually keeps the soil underneath it relatively warm.

## **WIND**

It is possible to briefly summarise the nature of winds from the four directions of the compass thus; East wind = Continental, West = Oceanic, North = Polar, South = Mediterranean. Try to notice how the strength and direction of the wind changes with the seasons and what effects these changes have on your specific gardening site. Nearby mountains, buildings and trees create local wind-flows and channels. The best windbreaks are non-solid, permeable barriers such as hedging which slow the wind down, rather than solid objects such as walls which compress and accelerate the wind to even greater speeds, creating dangerous eddies and vortices.

## **LUNAR PHASES**

The 29 ½ -day moon cycle has the same gravitational effect on the land as it does on the seas and oceans. The water in soils, plants and even animals is subtly pulled up and pushed down twice a day by the changing force of the moon's gravitational field as it orbits the earth. At full and dark moons, this tidal effect is greater, which encourages extension growth [shoots and roots]. At half-moons, soil water rises and falls less, consolidating the growth made before. Try to sow around the start of the second waxing quarter moon, which allows the seeds to be influenced by the expansive full moon. Transplant during the fourth quarter [old / waning moon] to allow plants' roots to gently re-establish under the influence of the dark moon.