

OPTIMAL PLANTING PATTERN

Imagine a plant, any plant from the smallest radish to the largest tree:-

Above Ground: Shoots / Stem / Trunk / Branches / Leaves / Flowers / Seeds / Fruits

Below Ground: Tap-Root / Side-Roots / Fibrous / Feeder Roots / Mycorrhizal Association

A plant's root system can extend as far, horizontally and vertically, below ground as its aerial parts do above ground. Large trees can be observed to have a *drip-line*, a concentric circle, where their canopy of leaves sheds rain to the outer edges of the rooting zone, where its young, vigorous feeder roots are concentrated.

If allowed to, any plant will grow outwards in all directions, forming a progressively larger circle. As cultivators, we want our plants to attain the largest rooting circle possible for that plant. We can do this by providing uniformly-improved fertile soil without obstructions or obstacles, and reducing competition with other plants. This will allow each plant to fulfil its maximum cropping potential.

Remember that most of our staple vegetables and fruits are huge compared to their ancestors and have been bred for larger size over hundreds of generations.

REASONS FOR USING PLANTING PATTERN.

- Maximises the use of space, soil, water and sunlight.
- Minimises the area of bare soil.
- Allows you to fit the maximum number of plants into the area available, providing sufficient space for each plant to thrive and attain its full potential.
- Efficient use of space is more important when:
 1. SPACE Limited land available.
 2. TIME Plants long-lived and will occupy the space for a long time (e.g. perennials / orchards).
 3. MONEY If plants are especially valuable or they need an expensive, protected environment. (e.g. seedlings in pots arranged in trays in a greenhouse)
- Prevents pests and diseases from transferring from one plant to another. Plants' leaves touch only when mature.
- Traditional spacings in rows force plants to grow in a rectangle. They are most suitable when the crop is best sown direct on a field scale or where machines are being used. Optimal pattern means you only have to think of one distance, the diameter of the plant's rooting circle, which is equal to the distance from one plant to another in every direction.

EXPLANATION OF CHART (see over)

1. ROOTING CIRCLE. How far the roots will spread from its stem in every direction. The growing point is at the centre of the circle and the feeder roots of the mature plant are at the edge of the circle.

2. DIAMETER OF ROOT-ZONE. The diameter is the same as the space between plants, the planting distance.

3. HEXAGONAL PATTERN. When plants grow, they will use every bit of space available. This illustrates the hexagonal, honeycomb pattern which is the most efficient arrangement. Each individual plant is surrounded by six neighbours.

4. PLANTING PATTERN. The pattern to think of and form when planting out. Forming an equilateral triangle, using the previous plant(s) as a reference point(s). This can also be understood as a diamond pattern. It helps to imagine or mark a line perpendicular (at right angles) to the edge of the bed. This can be made by a plank which can also be used to step on and distribute your weight.

5. HOEING PATTERN. It is possible to hoe between the crop in three directions: laterally from side to side or diagonally in two directions. This makes it easier to hoe and weed without damaging plants. It is also possible to re-shape the soil around individual plants, to deliver water where it is needed at different stages of the plant's development and earth up around crops which need it.

6. INTER-PLANTING. A smaller, short-lived catch-crop or companion can be fitted between main crop.

Learner Sig.

Date

Assessor Sig.