

Tillage radish – *Raphanus sativus*

Tillage-type or Daikon radishes produce a large taproot. As the name suggests, its large root can break through compacted layers and plough pans - improving drainage, water infiltration, and air movement through the soil profile. The roots can reach down to 2m deep.

Tillage-type radish acts as a catch crop – absorbing and retaining nutrients that may otherwise leach out of the soil and can be made available for the next crop.

Fast establishment and a thick canopy provide good weed suppression. Radish often forms part of “insect havens” – where its flowers attract pollinators and beneficial insects.



Strengths

- Builds organic matter
- Helps to improve soils structure
- Improves water infiltration and water holding capacity
- Fast growing annual
- Suppresses weeds
- Improved soil nutrient availability
- Alleviates soil compaction
- Natural biofumigant (variety dependent)

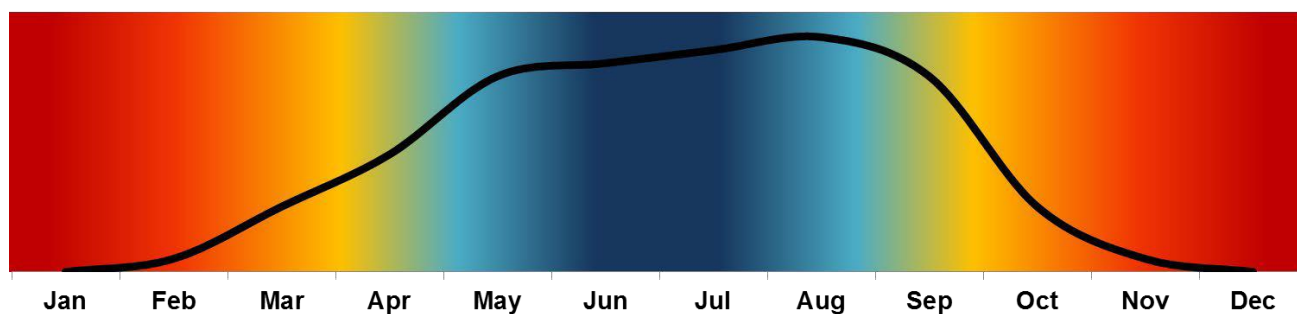
Limitations

- Not a winter hardy species (low frost tolerance)
- Not tolerant to waterlogging

What can it be used for?

Cover Crop: Tillage-type radishes often form part of cover crop mixtures, along with temperate cereals.

Production potential: Production values of up to 6 tons/ha. Production potential varies and is dependent on management, utilisation, rainfall, planting time and soil fertility.



Relative growth curve of a Tillage Radish stand - one-year cycle





Metabolic disturbances in animals on cultivated pastures:

Can become a choking hazard, if lifted out and chopped up as feed for cattle.

Establishment

- Climate:** Tillage-type radishes are best planted in Autumn – from mid-January until May (depending on location). Radishes grow best when planted early enough to allow 6 weeks of growth before regular frosts.
- Moisture:** Radishes grown as Cover Crops need 350mm to 650mm. This crop flourishes with good autumn rain.
- Soil:** This crop is best established on sand to sandy-loam soils that have a good water holding capacity. Often well-drained clay soils with good water holding capacity are also suitable.
- Fertilization:** Radish reacts well to a good fertilisation of phosphate (P) and potassium (K) before establishment. Fertilisation should initially strive to obtain at least 20 mg/kg of P and 140 mg/kg of K.

	N (kg/ha)	P (mg/kg soil)	K (mg/kg soil)
Requirement for establishment***	20-40*	20	120- 140
Seasonal application (kg/ha)	50-150**	Use removal rates	
Production - Removal rates (kg/ton):			
Good quality fodder	23	1.7	18
Average quality fodder	15	1.3	12
Poor quality fodder	10	0.9	7

*Fertilizer just after establishment (kg/ha)

**Selected rate should maximise profit

***Determined by production potential





When radish decomposes there is a rapid release of Nitrogen. Radishes are excellent accumulators of P and K (root dry matter commonly contains more than 0,5% P and 4% K), and research has shown that soil P levels have been higher after a radish crop. Nutrients absorbed by the taproot are readily available to the following cash crop because the taproot is mostly water and desiccates and decays quickly, releasing those nutrients almost immediately (two to four weeks).

Methods: Planting depth should be between 0.6cm to 2.5cm. The seed should be broadcast or shallow sown to a fine seedbed, ensuring that there is good soil to seed contact and enough moisture in the soil to promote seed germination. The seedbed should be rolled immediately after sowing.

Seeding rate	Rows (90cm)			Broadcast
	Low potential	Medium Potential	High potential & Irrigation	Irrigation
2 kg/ha		2.5 kg/ha	3.5 kg/ha	4 kg/ha

Resources

1. Gruver, J., Weil, R., White, C. and Lawley, Y. 2014. Radishes – a new cover crop for organic farming systems. <https://www.grainsa.co.za/conservation-agriculture:-part-15> (Access date 21 April 2020).
2. Evens, E. 2019. Corn (Z Corn (Zea mays L.) yield r ys L.) yield response to tillage radish (Raphanus sativus L.) when planted with annual and winter hardy cover crops Iowa state University. <https://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1269&context=creativecomponents> (Access date 21 April 2020).
3. <https://www.cotswoldseeds.com/species/143/tillage-radish> (Access date 21 April 2020).

