



# Farmnote

Reviewed July 07

## Growing swedes and turnips in Western Australia

By John Burt, Development Officer, South Perth

Swedes (*Brassica napus* var. *napobrassica*) and turnips (*Brassica rapa*) are in the Brassica or Crucifer family which also includes cauliflowers, broccoli, cabbage, radish and brussel sprouts. The edible portion is called a 'root', but is in fact derived from the enlarged base of the stem. They are biennial plants that are grown commercially as annuals. Swedes are called rutabagas in the USA.

Swedes are often confused with turnips, but they differ in having greyish green, deeply lobed, non-hairy leaves and a distinct neck between the swollen 'root' and the leaves. They mature in 90 to 120 days compared with 60 to 80 days for turnips. Swedes also have larger, more elongated, roots, and the base of the root is usually light yellow and not white.

A total of 432 t swedes and 472 t turnips were marketed through Market City, Canning Vale in 1998/1999, but this does not represent total production of these crops in Western Australia. The main production area is between Wanneroo and Baldivis. Production is highest in the cooler months. Produce is mainly marketed fresh on the local market and a small proportion of the crop is marketed in mixed vegetable or soup packs. Swedes and turnips are mainly used as cooked vegetables, in soups, stews and casseroles. Turnips may also be used in salads, especially the Japanese varieties.

Swedes and turnips are high in carbohydrates, energy value, fibre and vitamin C.

### Climate

Swedes and turnips can be grown throughout the year in the Perth area and the south-west. However, they give the highest yields and quality if sown in summer and autumn to mature in winter and spring.

Swedes are not affected by frost and turnips may be only slightly damaged.

Plants may show more bolting (flowering) with late autumn

plantings, due to prolonged temperatures below 10°C. Bolted plants have hard roots and are not marketable.

### **Soils**

Most free-draining soils are suitable for growing swedes. They grow best on soils which are slightly acid to neutral (pH 6.0 to 7.0 by water system of measurement or pH 5.2 to 6.2 by the calcium chloride system of measurement). Apply lime sand or ground limestone, at least three months before planting, if the soil pH is too acidic (less than 5.5 by water system of measurement or 4.7 by the calcium chloride system).

### **Rotation**

An interval of four years is recommended between Brassica crops to prevent a build-up of diseases such as clubroot, *Pythium*, *Rhizoctonia* and black rot.

### **Seed and plant spacing**

Swede seed is relatively small at 300 to 400/gram. The seed is direct sown at 10 to 15 mm deep at rates of 2 to 4 kg/ha. Air seeders can accurately control the seed spacing within the rows.

Plants are spaced at about 30 cm between rows and are later hand thinned to 10 to 15 cm between plants within the rows.

### **Variety**

Laurentian is the main swede variety. This variety has yellow flesh, and is deep purple at the crown and the lower half is light yellow. Purple Top is the main turnip variety. This variety has white flesh, is deep purple at the crown and the lower half is white. Check with the suppliers for new varieties of swedes and turnips.

There are also miniature varieties of swedes and turnips, and varieties that are completely white. Japanese turnip varieties (kabu) such as Tokyo Top and White F1 are grown on a small scale. They are white-skinned and have a higher moisture content than the main varieties.

### **Soil fumigation**

Metham-sodium can be applied to moist soil as a general soil fumigant at 500 L/ha more than 10 days before planting. This will give some control of soil diseases, including clubroot, nematodes and weeds.

### **Fertilisers**

Regular supplies of nutrients are essential to obtain high yields and quality. However, it is important to not over-fertilise as this will

increase costs and may result in induced deficiencies of some elements and pollute groundwater. Over-use of nitrogen will result in excessive top-growth and mis-shaped roots.

After planting, top-dressings of fertilisers can be applied by machine, by hand, or through the irrigation water (fertigation) if the sprinklers apply water uniformly. Agran®, urea and magnesium sulphate are soluble. Sulphate of potash and borax are fairly soluble, and can be applied by fertigation.

Table 1 shows the rates of magnesium and trace elements to be applied to swedes and turnips before planting.

<b>Table 1. Magnesium and trace elements before planting swedes or turnips</b>	
Magnesium sulphate	50 kg/ha to supply magnesium
Manganese sulphate	20 kg/ha to supply manganese
Ferrous sulphate	18 kg/ha to supply iron
Copper sulphate	18 kg/ha to supply copper
Zinc sulphate	18 kg/ha to supply zinc
Borax	18 kg/ha to supply borax
Sodium molybdate	2 kg/ha to supply molybdenum

Compost at up to 50 cubic metres per hectare is beneficial, if applied before planting or to the previous crop in the rotation. This will add organic matter to the soil, retain moisture in the soil, and supply nutrients.

A soil analysis, using the Colwell test before planting will show the amount of phosphorus to apply for a Karrakatta soil on the Swan Coastal Plain. Double superphosphate is the preferred method of applying phosphorus. Compared with single superphosphate, it contains lower levels of cadmium which is a toxic heavy metal. Depending on the results of the soil test, apply 150 to 600 kg/ha of double superphosphate before planting. On Bassendean sands, split the phosphorus application, apply half before planting and the rest four weeks after planting.

Starting one week after planting, apply fertilisers weekly to swedes at rates shown in Table 2. Crops take longer to mature in winter, and the program may have to be continued for a few more weeks. For turnips, there would be a shorter, but similar program. For a well grown crop, cease fertiliser applications 7 to 14 days before anticipated harvest.

**Table 2. Fertiliser program for swedes after planting**

Time after planting	Urea (kg/ha)	Muriate of potash (kg/ha)	Magnesium sulphate (kg/ha)	Borax (kg/ha)
1 week	50	75	50	10
2 weeks	50	75		
3 weeks	50	75		
4 weeks	50	75		
5 weeks	50	75	50	10
6 weeks	50	75		
7 weeks	40	60		
8 weeks	40	60		
9 weeks*	40	60		
10 weeks*	40	60		
11 weeks*	40	60		

On acid soils, sodium molybdate at 1 gram/litre may be necessary as a foliar spray at one week after transplanting to prevent 'whiptail'. On alkaline soils, manganese sulphate at 8 g/L may be necessary as a foliar spray.

It is recommended that nutrient analyses are made of the soil and irrigation water before planting, plus one to two analyses of the youngest mature leaves after planting. This will enable some adjustments to the fertiliser program and provide information on nutrients that are deficient or toxic. Some of the suggested nutrients in the programs in this publication may be deleted or reduced, if it is obvious that they are sufficiently high in the irrigation water and soil, including sources from compost and fertilisers from previous cropping.

Symptoms of the most common nutrient deficiencies are shown in Table 3.

**Table 3. Symptoms of common nutrient deficiencies in swedes and turnips**

Nutrient	Symptoms

Nitrogen	Plants are stunted. Young and middle leaves become pale. Older leaves develop reddish tints beginning at margins. Yellow leaves common at the base of the plant.
Phosphorus	Plants are stunted. Dull purple tints develop in the older leaves. In severe cases there is brown papery scorching of old leaves.
Potassium	Marginal and interveinal yellowing develops on older leaves followed by scorching of affected areas. In severe cases, the whole leaf may be affected.
Magnesium	Distinct yellow mottling occurs on oldest leaf beginning at the margin and moving inwards. If deficiency is not corrected, younger leaves also become affected. Some scorching of affected areas may occur in severe cases.
Iron	Yellowing of youngest leaves.
Manganese	Pale mottling on leaves in middle to top part of the plant.
Molybdenum	Leaves become narrow and twisted ("whiptail") with sometimes just the mid-rib remaining. Leaves at the growing point become stunted and may die.
Boron	Brown discolouration on "roots" and inside "roots". Horizontal cracking in the outside of the mid-rib and corkiness in the inside of the mid-rib can occur.
Zinc	Twisting of young leaves.

### Irrigation

Swedes must be grown evenly with no moisture stress. Apply water to replace 140 per cent of evaporation by either butterfly or knocker sprinklers (see Table 4). These data represent average conditions and adjustments must be made for marked changes in temperatures, humidity, effective rainfall, wind speeds and evaporation (based on your nearest weather station).

**Table 4. Irrigation per day by butterfly and knocker sprinklers for average conditions based on 140% evaporation replacement**

Month	Average evaporation mm/day at Medina Research Station	kL water per hectare per day at 140% replacement	Minutes per day for a typical butterfly sprinkler	Minutes per day for a typical knocker sprinkler
January	8.8	114	36	82
February	8.9	116	37	82
March	6.8	88	28	64
April	4.0	52	16	38
May	2.6	33	10	24
June	2.0	26	8	19
July	1.9	25	8	19
August	2.3	30	9	22
September	3.3	43	14	31
October	4.8	62	19	45
November	6.6	85	27	63
December	8.4	110	34	80

The irrigation data has been adjusted to compensate for the 85 per cent efficiency rating of typical butterfly sprinklers spaced at 250 per hectare with an output of 15 litres per minute or 3.75 kL/ha/minute. Typical knocker sprinklers have an efficiency rating of 80 per cent and are spaced at 69 per hectare with an output of 25 litres per minute or 1.725 kL/ha/minute.

On hot days, with temperatures exceeding 30°C, applying two irrigations results in less crop stress and more efficient use of water. In the warmer months, apply half of the water between 7 to 9 a.m., and half between 2 to 3 p.m. Do not water later than 3.00 p.m., to ensure that the leaves are dry at night and less susceptible to diseases. The crop must be kept well watered in hot, windy weather to avoid internal browning. In the cooler months, from May to September, apply all of the water daily between 7 and 9 a.m.

It is not necessary to irrigate if actual rainfall exceeds actual evaporation by 1.0 mm. Adjust the irrigation time if rainfall is lower than the actual evaporation.

### Water salinity

Water salinity should be less than 1000 mg/L total salts (electrical conductivity of 180 millisiemens per metre), but highest yields and quality are obtained if the water contains less than 500 mg/L (90 millisiemens per metre).

Plants seriously injured by salt are stunted and can develop thick dark green leaves with marginal yellowing or burning.

### Pests

There are many pests and early detection, recognition and treatment is essential to maximise returns. Pests vary in importance from season to season, depending on the weather and the management practices adopted by the grower. Table 5 shows some of the pesticides registered for swedes and turnips (see [Footnote](#)).

<b>Table 5. Control of pests with registered pesticides</b>		
Pest	Pesticide chemical name	Trade name®
Aphids (leaves) Redlegged earth mite(leaves)	Dimethoate	Rogor
Aphids	Pirimicarb	Pirimor
Grubs (leaves)	<i>Bacillus thuringiensis</i>	Dipel Thuricide Xentari
	Chlorpyrifos	Chlorfos
		Lorsban
	Cyfluthion	Bulldock
	Deltamethrin	Decis
	Esfenvalerate	Hallmark Sumi-Alpha
	Methomyl	Lannate
Nematodes (roots)	Fenamiphos	Nemacur

Rotate pesticides regularly to prevent the development of pest resistance to individual pesticides. This is particularly so for cabbage moth.

Brassicas are less affected by root knot nematodes than other vegetables. The large swellings on roots usually indicate the presence of clubroot disease and not root knot nematode. However, Brassicas may be affected in the warmer months by sugar beet nematode when plants readily wilt in the field. The roots become intensely branched and small cysts which resemble grains of sugar may be seen when the roots are washed.

Swedes and turnips may be affected by grubs, especially diamond back moth or cabbage moth in spring and autumn. The larvae are light green/brown and about 12 mm long. A biological insecticide containing *Bacillus thuringiensis* (aizawai strain) applied weekly for one to four weeks followed by a different insecticide such as a synthetic pyrethroid or *Bacillus thuringiensis* (kurstaki strain), each sprayed weekly for one to four weeks should give the best means of control. It may be necessary to spray every four days if grubs are at a high level.

Snails and slugs may be a problem in the cooler months.

### **Diseases**

For information on diseases, see Farmnote 39/90 on "[Diseases of crucifers](#)". Swedes and turnips are most prone to the diseases blackrot, clubroot, white rust and *Sclerotinia* which are mentioned in this Farmnote. More detailed information on clubroot may be found in Farmnote 69/90 '[Clubroot disease of crucifers](#)'.

### **Weed control**

Weeds must be controlled mainly by mechanical means or by hand.

Sethoxydim (Sertin®) can be applied over the crop to kill post-emergent grasses, more than 42 days from harvesting. Chlorthal (Dacthal®) is registered on turnips as a residual herbicide that is applied after planting, but before weeds emerge. However, it was difficult to obtain in 2000.

There is an off-label permit for propachlor (Ramrod®), which is a residual herbicide that is applied after planting, but before weeds emerge. The current permit will expire in 2002.

### **Harvesting**

Swedes and turnips are usually harvested by hand and leaves are removed in the field. Modified potato diggers are used by large-scale growers in other States.

Harvest during early morning and keep produce cool, especially Japanese turnips and miniature varieties.

The best size for swedes is a diameter of 80 to 100 mm, with a



minimum of 50 mm. Turnips are marketed at 50 to 80 mm diameter. However, specialist miniature swede and turnip varieties are marketed at a diameter of only 30 to 40 mm.

The roots of swedes are severely trimmed such that the swollen root has two wedge shaped cuts at the lower end. This trimming improves presentation and removes signs of clubroot which only affects the true roots at the base of the swollen 'root'. Turnips are not trimmed in this way, but a 1 to 2 cm length of stalk may be left on the crown of the 'root'.

After washing, swedes and turnips are often packed in 5 kg bags which are placed inside 36 L crates, or 22 L plastic crates, or in pallets. Produce can also be individually packed in crates.

### **Storage**

Store at 0 to 1°C at 90 to 95 per cent relative humidity for four to six months, if required. Swedes have a longer storage life than turnips, especially Japanese turnips.

### **Yields**

A good crop should produce 25 to 40 t/ha. Statistics show an average yield of 15 to 20 t/ha in Western Australia.

---

[PrimeNotes Index](#)

[Search](#)

**Disclaimer:** This material has been written for Western Australian conditions. Its availability does not imply suitability to other areas, and any interpretation or use is the responsibility of the user. Mention of product or trade names does not imply recommendation, and any omissions are unintentional. Recommendations were current at the time of preparation of the original publication.

**This file:** F02399.HTM      **Date converted:** 24 July 2000

© Copyright Chief Executive Officer, Agriculture Western Australia, 2000