



## Growing rhubarb in Western Australia

By John Burt, Development Officer, South Perth

Rhubarb (*Rheum rhaponticum*) originates from China and is a member of the Polygonaceae or dock family. The main part of the plant is the crown which is semi-woody and perennial. It is valued for its long, thickened, red stalks, up to 75 cm long, which arise from the crown and carry the large leaves. The stalks are used as a dessert, mostly in pies and have an acidic taste. They contain useful levels of acids (pH 3.0–3.6), sugars, fibre, protein, potassium, calcium, magnesium and vitamin C. The leaves are poisonous and may contain high levels of oxalic acid.

In Western Australia, a small area of rhubarb is grown commercially throughout the year for the domestic market, mainly in the Wanneroo area.

Consignments of rhubarb to Market City, Canning Vale were 167 t in 1998/1999. Production is lower in Western Australia in the cooler months, but there are heavier consignments to the market from April to October due to imports from Queensland.

### Climate

Rhubarb grows best in cool to warm conditions and yields and quality decrease as the temperature rises above 27°C. The best colour of the stalks occurs in cool temperatures.

Rhubarb will withstand slight frosts, but heavy frosts may cause dieback. However, the plants will resume growth with the onset of favourable conditions.

Rhubarb is a deciduous plant in Europe. In Western Australia, it retains its leaves throughout the year, but has less vigour in winter.

### Soils

Rhubarb is adapted to a wide range of soils in the pH range of 5.5 to 6.5 (water system of measurement) as long as they are well drained and prepared with large amounts of added organic matter such as conditioned poultry manure or compost.

### Propagation and planting

Growers normally plant a new area of rhubarb each year. Rhubarb can be propagated by division of crowns into planting pieces or from seed.

Crown division is preferred where suitable good quality material of proven varieties such as Sydney Crimson or growers' selections are available. New areas are established preferably from summer to early winter, or from August to September, by using vigorous, disease-free crowns. Growers have also selected plants with desirable characteristics from seedlings, which can be reproduced by division of crowns. These are divided into planting pieces by cutting between the 'eyes' so that a piece of the crown has at least one eye. A total of 6–10 cuttings can be made from a crown older than two years.

Named varieties are difficult to obtain in Western Australia and they are expensive. Existing growers will not usually supply their own varieties to other growers and bulking-up may be slow.

Variable plant types result from seedling plantings, but this method serves a useful purpose in selecting superior types for subsequent multiplication by crown subdivision. This method is the one mostly used by new growers entering the industry as it is cheap and seed supplies are readily available. Careful selection of superior plant types over a period of years by established growers has resulted in the development of local types with marked improvement in yield, quality and uniformity.

Plantings can be established from seed by transplanting seedlings raised either in open seedbeds or in containers. Autumn is the preferred time. Transplants are put out in the field at 6–8 weeks from seeding at 30 cm apart and assessed for yields and quality. Many of the seedlings will be inferior, with stems which are too green. The best selections should be established and can be bulked up after 2–3 years by dividing the crowns.

The main plant characteristics selected for are high yield, regular cropping (5–6 picks per year), straight, erect, thick evenly red-coloured stalks of uniform thickness and length, ease of harvesting and adaptability to seasons. Note that green-stalked plants are as suitable for cooking as the red-stalked varieties, but the market perception is that these are unripe and therefore only the red-stalked varieties are marketed. In some countries, green-stalked varieties are preferred.

The most popular spacings are 90–120 cm between rows and 60–75 cm between plants within rows. Care should be taken not to damage shoots or buds in the

### Important Disclaimer

The Chief Executive Officer of the Department of Agriculture and Food and the state of Western Australia accept no liability whatsoever by reason of negligence or otherwise arising from the use or release of this information or any part of it.

case of crown divisions and to plant them and seedlings at the correct soil level. The buds of the crowns should just be above soil level. Do not plant too wide apart, as this may result in increased flowering of the plants.

## Fertiliser

Rhubarb is a heavy feeder. Apply up to 50 cubic metres per hectare of compost before planting and up to 50 cubic metres per hectare of compost every year. This will add organic matter to the soil, supply nutrients and help retain moisture in the soil.

Apply double superphosphate at 600 kilograms per hectare. The rate of phosphorus can be reduced on old vegetable ground, or if compost is regularly used. Do not use ordinary superphosphate as this contains higher levels of cadmium which is a toxic heavy metal that may contaminate the plant.

The crop will respond to a balanced fertilising of nitrogen and potassium every one to three weeks. Apply these nutrients as 80 kg of urea or 110 kg ammonium nitrate, plus 75 kg of muriate of potash per hectare. Do not apply too much nitrogen as this will result in excessive flowering and elongated poor quality stalks. Apply magnesium sulphate at 50 kg/ha every three months.

Rhubarb is often affected by manganese deficiency on alkaline soils. This shows as a mottled chlorosis (yellowing) on the young and medium-aged leaves.

Apply the following rates of trace elements to the soil every 18 months.

20 kg/ha manganese sulphate to supply manganese;

18 kg/ha borax to supply boron;

18 kg/ha ferrous sulphate to supply iron;

18 kg/ha copper sulphate to supply copper;

18 kg/ha zinc sulphate to supply zinc; and

2 kg/ha sodium molybdate to supply molybdenum

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.

Do not apply excess fertilisers, because nitrogen, phosphorus and potassium are easily washed through sandy soils by rainfall and irrigation. This may lead to groundwater pollution in rivers and estuaries.

## Irrigation

Rhubarb requires a higher level of watering than most vegetables.

Plants must be kept well watered, with one watering per day in early morning from April to October, dependent on rainfall and two waterings per day, half between 7 to 9.00 a.m. and half between 2 to 3.00 p.m. from November to March. Table 1 is a guide for watering, but there has been no research work with rhubarb to obtain the precise watering needs of the crop. Do not over-water after the planting of crown divisions, as this may cause rotting.

Evaporation data from Medina Research Station represents average conditions, and adjustments must be made for marked changes in temperatures, humidities, effective rainfall and windspeeds. Use evaporation data from the nearest meteorological station if your property is not situated near Medina.

Typical butterfly sprinklers are spaced at 277/ha with an output of 15 litres/minute or 4.15 kL/ha/minute. Typical knocker sprinklers are spaced at 69/ha with an output of 22 litres/minute or 1.52 kL/ha/minute. The irrigation time has been adjusted to compensate for the efficiency rating of butterfly (85%) and knocker (80%) sprinklers.

**Table 1. Irrigation data for butterfly and knocker sprinklers on rain-free days based on average evaporation at Medina Research Station**

Month	Average evaporation mm/day at Medina Research Centre	Average water kilolitres per hectare per day at 140% evaporation replacement	Average minutes per day for a typical butterfly sprinkler	Average minutes per day for a typical knocker sprinkler
January	8.6	120.4	32.5	89.0
February	8.1	113.4	31.5	86.0
March	6.2	86.8	25.0	66.0
April	3.8	53.2	15.0	40.0
May	2.3	32.2	9.5	25.5
June	1.8	25.2	7.0	19.0
July	1.7	23.8	6.5	18.0
August	2.2	30.8	8.5	23.0
September	3.1	43.4	12.0	33.0
October	4.5	63.0	17.5	47.5
November	6.2	86.8	25.0	66.0
December	7.8	109.2	30.0	82.5

## Weed control

Control of weeds in a mature rhubarb crop is difficult as deep mechanical hoeing may damage the root system. Shallow hand hoeing is still the best means of weed control. There are no chemicals registered for the control of weeds in this crop.

One option is to use directed and shielded sprays of a desiccant herbicide such as paraquat/diquat before each flush of growth.

## Pests and diseases

The main disease of rhubarb is downy mildew (*Peronospora destructor*) which appears as brown patches on the leaves, especially after storms from May to October. A fungicide based on copper or mancozeb will help to control this disease.

Rhubarb can be killed by crown rot caused by *Rhizoctonia* or *Phytophthora* diseases. These diseases may be difficult to control. Ensure that rhubarb is rotated every few years with other crops and that plants are grown on soils with good drainage.

Rhubarb may be affected to a slight extent by *Alternaria* and *Phoma* species, which cause black spots on the leaves. The active ingredient chlorothalonil will help to control these diseases if necessary.

The level of pest damage is low in rhubarb, but keep a look out for aphids, black beetle, grubs, mites, slugs and snails, vegetable weevil and wingless grasshoppers.

Sugar beet nematode (*Heterodera schachtii*) may damage rhubarb and the cysts on the roots are similar in appearance to sugar grains. Root-knot nematode will also damage rhubarb. Fenamiphos is not registered for controlling nematodes on rhubarb and it may be necessary to use metham sodium fumigation before planting. This will also control some diseases and weeds in the soil.

## Flowers

Remove flowers as they will cause difficulties with boom spraying against pests and will also deplete plant foods required for future stalk production. Flowering is most common after cold winters and hot summers.

## Harvesting

Pull the stalks away from the plant with a downward motion, so that all the stalk is removed. Do not cut the stems, as this will result in rotting. Growers usually pick the mature stems and leave the four youngest stems. The plant is ready for picking just before the sides of the oldest leaves begin to turn down.

New plantings are ready for picking after 9–12 months. When established, rhubarb may be picked every 6–10 weeks throughout the year.

## Yields

The best crops are produced between April and July. The stalks show the most colour from May to December.

There may be a shortage of rhubarb in the late winter and early spring when demand is highest and production is affected by lower temperatures. Prices are usually highest from June to September and lowest from November to March. Good yields are 15 tonnes/ha per year.

## Packing

The crop is washed, trimmed, graded and packed loose or in 0.5–1.0 kg bunches (5–10 stems), and held by rubber bands in 18 or 22 L (10 kg) crates. All damaged and split stalks should be discarded. Trim the leaves to within a few centimetres of the main stalk.

## Storage

Rhubarb can be stored at 0°C and over 90 per cent relative humidity for up to two weeks.

## Life of the crop

Rhubarb can be picked for 10 years, but it is preferable for a commercial crop to be kept for 3 to 6 years.