



OUTSTANDING QUALITIES

- ◆ DARK GREEN SMOOTH LEAVES
- ◆ UPRIGHT GROWTH HABIT
- ◆ SPADE SHAPED LEAVES
- ◆ WIDE ADAPTABILITY

Riverside is a new addition to the Sakata spinach range, ideally suited to baby leaf production. **Riverside** can be used for mechanical harvesting or hand harvesting. The dark green leaves are smooth and very thick, with an upright growth habit. In addition to excellent quality leaves, the variety also has a very good disease package with resistance to Downy mildew (Pfs) races 1-11, 15-16 and intermediate resistance to race 12,14. Days to maturity for baby leaves are 25 - 30 days in main season production. Even though **Riverside** does exceptionally well in winter, it is suitable for year-round production in mild climatic zones.

SPECIAL VARIETAL REQUIREMENTS

- Contact area representative for more information

CHARACTERISTIC*	RIVERSIDE
KIND	F1 hybrid spinach (<i>Spinacea oleracea</i>)
MATURITY	Between 25 - 30 days
LEAF COLOUR	Dark green
LEAF SURFACE	Smooth
PLANT HEIGHT	10 - 15 cm
STEM TYPE	Thin, upright
DISEASE REACTION (SCIENTIFIC)	High resistance: <i>Peronospora farinose</i> f. sp. <i>Spinaciae</i> race 1-11, 15-16 (Pfs: 1-11, 15-16) Intermediate resistance: <i>Peronospora farinose</i> f. sp. <i>Spinaciae</i> race 12,14 (Pfs: 12,14)
YIELD POTENTIAL	Good
USE	Fresh market and processing
SPECIAL FEATURES	Unique shaped leaf with excellent eating quality. High yield potential due to the thickness of the leaf blade

* Characteristics given are affected by production methods such as soil type, nutrition, planting population, planting date and climatic conditions. Please read disclaimer.

Disclaimer: This information is based on our observations and/or information from other sources. As crop performance depends on the interaction between the genetic potential of the seed, its physiological characteristics, and the environment, including management, we give no warranty express or implied, for the performance of crops relative to the information given nor do we accept any liability for any loss, direct or consequential, that may arise from whatsoever cause. Please read the Sakata Seed Southern Africa (Pty) Ltd Conditions of Sale before ordering seed. **Resistance:** is the ability of a plant variety to restrict the growth and development of a specified pest or pathogen and/or the damage they cause when compared to susceptible plant varieties under similar environmental conditions and pest or pathogen pressure. Resistant varieties may exhibit some disease symptoms or damage under heavy pest or pathogen pressure (HR = High resistance, IR = Intermediate resistance).

* **Experimental:** This variety does not appear on the current South African Variety list, but has been submitted for registration.

Recent version: Kindly contact Sakata or Area Representative for the most recent version of this Technical Bulletin.



GENERAL TIPS FOR SPINACH PRODUCTION

Spinach (*Spinacia oleracea*) description

Spinach, a member of the Chenopodiaceae (Goosefoot family), is a low-growing annual plant with broad, crinkly, and tender leaves forming a heavy rosette. It was first cultivated in Iran around 400 AD and spread to Europe by 1400 AD after being introduced to Spain by the Arabs in 1100 AD. The first savoyed leaf variety reached North America in 1828. Other notable members of this plant family (*Amaranthaceae*) include Swiss chard and beets.

Types and Varieties

There are two main types of spinach: smooth leaf and savoy (crinkled leaf). Both types grow equally well and are marketed similarly, though the savoy type is harder to clean due to its crinkled leaves. Asian leaf types are relatively smooth with pointed leaves. Fast-growing varieties are often best for winter production. Historically, savoyed cultivars were used for fresh markets, while smoother varieties were used for processing. Nowadays, smooth-leaved cultivars are favoured for packaged spinach (200g per bag) as they are easier to wash and present a quality product, often used in salads.

Climate for spinach production

Spinach prefers a cool climate, with seed germination occurring at temperatures between 2°C and 30°C, and an optimal range of 7°C to 24°C. The best crop growth happens with day lengths of about 12 hours and temperatures between 15°C and 20°C, though it can tolerate a minimum of 10°C and a maximum of 32°C. Spinach bolts rapidly in long, hot days, with the tendency to bolt varying among cultivars. Plants reach market size in 25 to 30 days, depending on temperature, moisture, and fertility. As a shallow-rooted crop, spinach requires a regular supply of moisture.

Crop Culture

Planting

Spinach is directly sown in a stale seedbed at a depth of 0.5-1 cm and spacing of 25 seeds/m in row with 18-60cm between row spacing row for bunching and full-sized production. For baby leaf production sow and up to 40seeds/m in row with between row spacing of 5cm. Baby leaf production has an average direct seeding rate of 1.2mil seeds/ha, depending on harvesting equipment it could be even denser seeding rates.

Irrigation

As a shallow-rooted crop, spinach requires a regular supply of moisture using drippers or overhead irrigation.

Soil type

Spinach can be grown on a variety of soils, but well-drained sandy loams or loams rich in organic matter are preferred due to their good drainage.

pH

Spinach is also very sensitive to soil acidity and prefers pH in the range of 6.5-6.8.

Fertilizer

All additions of lime and fertilizers should be based on recommendations from a soil test.

Spinach, being a short-season crop grown in relatively cool soils, benefits from having at least half of its nitrogen in the nitrate form. Preplant, apply 70 kg of nitrogen per hectare and incorporate it into the soil.

Three weeks after seeding, side dress with up to 50 kg of actual nitrogen per hectare. Avoid applying nitrogen later to prevent nitrate accumulation in the leaves. Urea can also be used as a foliar spray for nitrogen requirements.

For phosphorus, banded applications are ideal due to their proximity to developing seedling roots, as spinach has a high phosphorus requirement. Spinach is also a heavy feeder of potash, especially at high yield levels. Magnesium, applied as a foliar at 12 to 15 kg of Epsom salts per hectare, can enhance the production of dark green leaves. Magnesium deficiency shows symptoms like nitrogen deficiency, such as yellowing on older leaves, and can be addressed by using dolomitic limestone.

Micronutrient management is also important. Manganese deficiency, often due to over-liming, can be corrected with foliar sprays of manganese sulphate. Spinach is quite susceptible to boron deficiency, which should be addressed by applying boron in the fertilizer and as a foliar spray or soil drench. Molybdenum may be necessary, particularly in acidic soils.

Apply fertilizer either by broadcasting and working it into the soil preplant or by banding it 5 cm below and 5 cm to the side of the seed row. Only a portion of the potash should be banded, with the remainder harrowed into the soil before planting. Side dressings or foliar nutrients can be applied if required.

Harvesting

Harvest spinach leaves at the coolest time of day when plants are dry. For baby leaf spinach, harvest when leaves reach the desired size, typically in 3-5 weeks, depending on the time of year and growth rate. Cut above the basal plate, rinse the leaves, sort out any cut or broken leaves, and package them. For full-size spinach, harvest by cutting the long stems just above the basal plate or by cutting just below the basal plate for whole-plant harvest. After harvesting, rinse the leaves, sort out cut and broken ones, and package them.

Disease reaction definitions:

Resistance: is the ability of a plant variety to restrict the growth and development of a specified pest or pathogen and/or the damage they cause when compared to susceptible plant varieties under similar environmental conditions and pest or pathogen pressure. Resistant varieties may exhibit some disease symptoms or damage under heavy pest or pathogen pressure. Two levels of resistance are defined:

High/standard resistance (HR): plant varieties that highly restrict the growth and development of the specified pest or pathogen under normal pest or pathogen pressure when compared to susceptible varieties. These plant varieties may, however, exhibit some symptoms or damage under heavy pest or pathogen pressure.

Moderate/intermediate resistance (IR): plant varieties that restrict the growth and development of the specified pest or pathogen but may exhibit a greater range of symptoms or damage compared to resistant varieties. Moderately/intermediately resistant plant varieties will still show less severe symptoms or damage than susceptible plant varieties when grown under similar environmental conditions and/or pest or pathogen pressure.

Disclaimer: This information is based on our observations and/or information from other sources. As crop performance depends on the interaction between the genetic potential of the seed, its physiological characteristics, and the environment, including management, we give no warranty express or implied, for the performance of crops relative to the information given nor do we accept any liability for any loss, direct or consequential, that may arise from whatsoever cause. Please read the Sakata Seed Southern Africa (Pty) Ltd Conditions of Sale before ordering seed.

Resistance: is the ability of a plant variety to restrict the growth and development of a specified pest or pathogen and/or the damage they cause when compared to susceptible plant varieties under similar environmental conditions and pest or pathogen pressure. Resistant varieties may exhibit some disease symptoms or damage under heavy pest or pathogen pressure (HR = High resistance, IR = Intermediate resistance).

* **Experimental:** This variety does not appear on the current South African Variety list, but has been submitted for registration.

Recent version: Kindly contact Sakata or Area Representative for the most recent version of this Technical Bulletin.

