SAKATA®
PASSION in Seed

Helios

F1 Hybrid Spinach

OUTSTANDING QUALITIES

- **DARK GREEN SMOOTH LEAVES**
- **UPRIGHT GROWTH HABIT**
- **OVAL SHAPED LEAVES**
- **WIDE ADAPTABILITY**

Helios is an F1 hybrid variety that is best suited to baby leaf production on a commercial scale. **Helios** can be used for mechanical harvesting or hand harvesting in all different production systems. **Helios** has smooth, dark green, thick leaves and an upright growth habit. The variety has a very good disease package with resistance to Downy mildew (Pfs) races 1-9,11,13,15-16 and intermediate resistance to race 12,14. Days to maturity for baby leaves are 25 - 30 days. Even though **Helios** has been selected for summer production, it fares well year-round in mild climatic regions.

SPECIAL VARIETAL REQUIREMENTS

- Contact area representative for more information

CHARACTERISTIC*	HELIOS
KIND	F1 hybrid spinach (Spinacea oleracea)
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:** *Peronospora farinose* f. sp. *Spinaciae race 1-9, 11, 13, 15-16* (Pfs: 1-9, 11, 13, 15-16) **Intermediate resistance:** *Peronospora farinose* f. sp. *Spinaciae race 14* (Pfs: 12,14)
YIELD POTENTIAL	Good
USE	Fresh market and processing
SPECIAL FEATURES	Excellent eating quality and minimal bruising due to thickness of leaves

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

Sakata Seed Southern Africa (Pty) Ltd.
Tel: +27 11 548 2800
e-mail: info.saf@sakata.eu
Fax: +27 11 548 2820
website: www.sakata.co.za

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 0.5-1cm 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.

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