

CAPSICUMS

Hot pepper (chilli), sweet pepper and paprika.

CLIMATE

These crops require warmer conditions than tomatoes, and are more sensitive to cold and frost. The optimum mean temperatures for growth, over the 4 to 5 month growing season, are 20°C to 27°C. At temperatures below 15°C growth becomes progressively poorer. At temperatures above about 32°C, excessive flower drop may become a problem, particularly when coupled with dry winds; chilli and paprika can withstand higher temperatures than sweet peppers. Exposed fruits of the sweet pepper are also very sensitive to sunburn; hot peppers and paprika are much less so. Prolonged cloudy weather retards and reduces fruit bearing.

Seedlings emerge within 7 to 14 days at soil temperatures of 20°C to 35°C. At temperatures of 15°C, emergence may be delayed by two weeks or longer. Germination is poor at temperatures below 15°C or above 35°C.

SOIL

Capsicums can be grown on a wide range of soil types, provided they are well-drained to a depth of at least 400 mm. Sandy-loam to loam soils are preferred, because they tend to warm up more rapidly than heavier soils, and yet have a good water holding capacity. Soils with a high humus content are ideal.

CULTIVARS

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| Chilli | - | Long Red Cayenne, Long Slim Cayenne, P2391, Serano, Skyline 3, Star 6601, Thai chilli, Thai Dragon. |
| Sweet pepper | - | California Wonder, Capistrano, Indra, King Arthur, Lancelot, Orobelle and Pasoreal. Most cultivars are green, turning red at maturity. However, yellow peppers are also available, and even whitish or mauve/purple fruits are now making their appearance, although none of these appear to be as popular as the green/red types. |
| Paprika | - | Papri Ace, Papri Queen, Papri King. |

POPULATIONS AND SPACINGS

Chilli and paprika

Plants are spaced 300 mm to 500 mm apart in rows drawn 600 mm to 750 mm apart. Twin row plantings, as for sweet peppers, are used. Populations vary from 35 000 to 50 000 plants per hectare.

Sweet pepper

Because of the sensitivity of these fruits to sunburn, the seedlings are usually planted out in double rows, sometimes even three or four rows (although this makes harvesting more difficult), spaced 350 mm to 500 mm apart. Picking pathways of 800 mm to 1 000 mm are left between the beds, to allow easier access (without causing serious damage to the brittle

branches). The plants are spaced 350 mm to 500 mm apart in the rows. Populations generally vary from 25 000 to 40 000 plants per hectare.

TIME OF PLANTING

Seed requirements per hectare are about 150 g to 200 g for seedtrays, and 250 g to 300 g for seedbeds. These crops are usually transplanted, often from seedlings raised under warm, protected conditions, or from seedlings produced in warmer areas. Early planting, as soon as temperatures become favourable for growth, is generally preferable to planting later, because of a longer favourable production season, and because later plantings are often more severely affected by virus diseases.

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| Cool areas | (heavy frosts) | Sept to Oct |
| Warm areas | (light frosts) | Aug to Nov/Dec |
| Hot areas | (frost free) | July to March |

A spread of planting times is seldom used for paprika, which is produced almost entirely for processing, and planting is generally confined to the August to September period.

FERTILIZERS

These crops generally receive about 600 kg 2:3:2(22) per hectare at planting; for sweet peppers a 2:3:4(30) mixture might be preferable. However, the phosphorus (P) (a minimum dressing of 40 kg P) and potassium (K) requirements should ideally be determined by soil analysis.

The total nitrogen (N) requirement is about 80 kg to 100 kg N per hectare for chillies, 100 kg to 120 kg N for paprika, and 150 kg to 180 kg N per hectare for sweet peppers. Chillies should receive one side dressing, usually of LAN, 4 or 5 weeks after transplanting, paprika probably two dressings, at 3 and 6 weeks, and sweet peppers up to three dressings, within the first 6 or 8 weeks of growth. The amount of LAN applied per dressing is usually 150 kg to 200 kg per hectare. Sweet pepper plants, especially, should be induced to make good early growth, as larger plants bear larger crops, and fruits are less exposed to sunburn. The first fruit, forming in the apex of the plant, should be nipped out at an early stage, to extend the cropping season and to reduce the risk of plant damage at a later stage. Further LAN dressings may be applied should the planting warrant it.

IRRIGATION

Because of the softer growth, the requirement for large fruit, and the susceptibility to sunburn (fruits are more exposed when plants are temporarily wilted), sweet peppers are considered to have a higher water requirement than chillies or paprika. The requirement is similar to that for tomatoes, even though the full-grown plants are considerably smaller. However, all these crops are normally irrigated in a similar manner.

The soil should be thoroughly wet to a depth of at least 400 mm at planting. For the first two weeks after transplanting, they are irrigated twice a week, 10 mm to 15 mm at a time, in order for the transplants to become well established. They are then irrigated, with 15 mm to 20 mm, once or twice a week for a further two or three weeks, depending on climatic conditions.

During the next eight weeks, 35 mm should be applied weekly, followed by approximately 30 mm per week for the rest of the season. Dry conditions from flowering onwards can cause a significant reduction in yield.

WEED CONTROL

Trifluralin (Digermin, Trifluralin or Triflurex), a pre-plant incorporated herbicide, is registered on chilli for the control of mainly annual grasses, but also some broadleaved weeds. It has a long residual action and may harm susceptible follow-up crops. Two pre-emergent herbicides are registered for use on paprika fields. They are alachlor (Lasso Micro Tech, Alachlor, Lasso or Sanachlor), which is applied in combination with Ronstar, and oxadiazon (Ronstar) on its own for control of a similar range of weeds, applied on the soil surface of fields prepared for seedling transplants.

No chemical which adequately controls most broad-leafed weeds is registered for use on capsicums. For this reason, most weed control is done mechanically and by hand.

PESTS

Apart from nematodes and red spider mite, capsicums are seldom severely affected by pests. There are registered chemicals for use on peppers against aphids, red spider mite and thrips. On paprika, several insecticides can be used to control American bollworm and false wireworm, as well as aphids and thrips.

DISEASES

Apart from virus diseases, which are more likely to occur on late plantings, or in the later stages of growth, and bacterial wilt, diseases are seldom a problem. Bacterial spot and powdery mildew may occur, for which several fungicides are registered as preventive control. With sweet peppers, rotting of fruits touching the ground can become fairly serious, especially on heavy soils, where the soil surface stays moist for a long time. The problem is more severe with those cultivars bearing large, and particularly long, fruits, which are more likely to be in contact with the soil.

Because of the incidence of virus infection, capsicum crops must be treated as annuals. Summer plantings on lands with a history of bacterial wilt must be avoided; no commercial cultivars which are resistant to this disease are available.

Sunburn can be a very serious problem with sweet peppers, particularly where fruit is allowed to ripen on plants without a good leaf cover, or where plants temporarily wilt due to lack of moisture.

LENGTH OF CROP

Fruits of most cultivars will attain their full size within 70 to 80 days from transplanting, when they may be harvested green. A further fortnight may be necessary for chilli and paprika fruits to turn red; sweet peppers could take a further two or three weeks before they colour up properly. Picking the fruits in the green stage induces further flowering and higher yields. The bulk of the crop is usually harvested over about 2 months, after which the crop is generally too small to warrant the cost of further picking. With sweet peppers, the later-developing fruits also become too small and tend to have a poorer shape, both of which adversely affect prices. The extra N dressings mentioned may counter-act this. A continuing light crop can be borne for several months until cold weather stops growth. These perennial plants can regrow in spring, if not killed by winter frosts, and give an earlier than normal crop. However, the yields and

quality are generally so poor that this is seldom a practical proposition for the commercial grower. Such plants probably are infected with mosaic, and the causal viruses may be transmitted by insect vectors to newly established plantings early in the season.

YIELDS

Sweet peppers, harvested green, should average 25 tons to 30 tons per hectare, with good crops yielding in excess of 40 tons. When harvested red, average yields are only 8 tons to 12 tons per hectare, partly due to losses from sunburn.

Green chillies should average 10 tons to 12 tons per hectare, with good yields of 15 tons and more per hectare. If picked weekly in the fresh red stage, and then dried, average dried yields are 2 tons to 3 tons, with good yields about 6 tons. If, however, the fruits are allowed to dry on the plants before picking, yields of only about 2 tons per hectare are likely.

Paprika is produced mainly in the dry state for processing factories. The fruits are picked red, and usually dried artificially. Average yields are generally 2 tons to 2,5 tons per hectare, with a good yield being about 5 tons.

HARVESTING, GRADING, PACKING AND MARKETING

Sweet peppers are generally harvested, at 7 to 14 day intervals, when they attain their full size, but are still green. There is a small but growing demand for red fruits, and cultivars are also available for yellow and other coloured fruit, for which there is a small demand. Fruits are normally cut or clipped off the plants, retaining a small section of stem on the fruits. Great care must be taken during harvest not to break off or damage the branches of these brittle plants. Apart from the direct losses of fruits on such branches, other fruits may be exposed to sunburn. Fruits of the sweet pepper are fairly tender and also brittle, and should be handled with care to prevent bruising and cracking.

Chilli and paprika plants are stronger, and fruits are usually picked by hand, without cutting. In most of KwaZulu-Natal, chillies are mainly harvested green, also at 7 to 14 day intervals, although a small portion of the crop may be allowed to colour up before picking, and is then dried. Paprika is seldom grown in KwaZulu-Natal because of the lack of local processors. Paprika is picked when fully coloured, and then dried, usually in special drying ovens.

Sweet peppers should be graded according to size, shape and colour before packing. Large, blocky fruits, usually four-lobed, and fully sized, are the most popular, especially for export. Younger fruits are not favoured, because their colour is lighter, their flesh thinner and they wilt more rapidly. Fruits which have wilted should be discarded, because they do not recover from this state. Late-maturing fruits from any planting become progressively smaller, tend to be more pointed, are often only three-lobed or malformed and, under cooler conditions, tend to develop a mauvish colour. Greater attention to grading is then necessary.

Each grade of fruit is packed separately, usually in double-layered cartons measuring 500 mm x 400 mm x 200 mm. Green chillies are seldom graded, apart from the obvious removal of diseased or damaged fruit. They are normally packed into green mesh pockets holding about 7 kg. Where red chillies are picked in a very dry condition, further drying is done in the shade in large, open sacks or crates in an airy shed. In the case of high humidity conditions they are usually dried in the sun, although this normally causes a loss of colour and a down-grading, with lower prices being received. Artificial drying is the only solution when rainy and very humid conditions prevail. Hot, dry conditions are required for successful natural drying of chillies. Weekly picking of ripe chillies is advisable for good yields.

SEASONAL PRICE TRENDS

Prices for fresh fruits of these warm season crops, especially sweet peppers, are likely to be lowest during the summer to autumn period, and highest in the late winter to spring season.

A sales outlet should be arranged before paprika production is commenced. The demand for sweet peppers tends to be relatively restricted, and it is advisable to investigate possible market outlets and tonnages required before establishing large plantings.