



The Climatic requirements of crops differ. They can be divided mainly in cool weather crops (prefer cool climate e.g. cabbage, onion) and warm weather crops (prefer warm climate e.g. sweet potato, pumpkin). The planting date will be influenced by this preference. Therefore the climate in your area will determine which crops can be planted when. Areas with warm winters e.g. lowveld areas of Mpumalanga, Northern Limpopo, Northern Kwa-Zulu-Natal and coastal areas, crops can be cultivated even in winter. In highveld areas (with cold winters) cultivation will be more limited than indicated below.

Crop	Soil pH	Planting date	Seed (g/m ²)	Spacing (cm)		Planting depth (cm)	Growing period (days)	Expected harvesting period
				Inter Plant	Inter row			
Onion: North of Welkom	6,0 – 7,0	Feb-Apr	0.7	7-10	20-25	1-2	90-210	Jun-Nov
Onion: South of Welkom		Apr-May						Dec-Mar
Peppers	5,5-7,0	Aug-Oct	0.1-0.2	40-60	50-100	1-3	70-80	Nov-Jun
		Jan-Feb						Apr-May
Watermelon	5,0-6,8	Aug-Sept	0.2-0.3	90	180-240	5	80-95	Oct-Jan
Muskmelon	6,0-6,8	Aug-Sept	0.1-0.2	20-30	120-150	2-4	90-125	Nov-Feb
Cucumber	6,0-6,8	Jan-Mar	0.2	50-60	120-150	2-4	40-60	Mar-Jun
		Aug-Sept						Sept-Dec
Pumpkins	5,5-7,5	Aug-Oct	0.3-0.4	90	200-270	2-5	120-150	Jan-Feb
Butternut	5,5-7,5	Aug-Oct	0.2-0.3	50-70	120-180	2-5	90-120	Nov-Feb
Sweet potato	5,6-6,5	Oct-Jan	4 cuttings/m ²	20-40	80-100	10-15	120-150	Mar-Jun
Tomato	6,0-6,5	Jan-Mar	0,05	40-50	100-150	2-3	100-145	May-Aug
		Aug-Sept						Nov-Jan
Beans (bush)	6,0-6,5	Feb-Mar	8-12	5	50	4	60-70	May-Jun
		Aug-Sept						Oct-Dec
Beetroot	5,8-8,0	Feb-Apr	0.6-0.8	7	20-40	2	77-105	May-Aug
		Aug-Sept						Oct-Dec
Cabbage	5,5-6,5	Feb-Apr	0.2-0.3	35-50	50-70	2	60-110	Apr-Aug
		Aug-Sept						Sept-Dec
Carrot	6,0-6,5	Feb-Apr	0.3-0.4	5	30-40	1	80-100	May-Aug
		Aug-Sept						Oct-Dec
Lettuce	6,5-7,0	Feb-May	0.2-0.3	30	40-60	1	84-105	May-Sept
Peas	6,0-7,0	Mar-Apr	12-20	5-7	30-45	3-7	80-120	Jun-Aug
Radish	6,0-6,5	Feb-Apr	0.4	5	30	2	28-35	Mar-Jun
		Aug-Sept						Aug-Nov
Potato	5,0-6,5	Apr-Jan	4 tubers/m ²	25	75	5	120-140	Sept-Nov

Crop	Soil pH	Planting date	Seed (g/m ²)	Spacing (cm)		Planting depth (cm)	Growing period (days)	Expected harvesting period
				Inter Plant	Inter row			
Spinach	6,0-6,8	Feb-Apr	0.8	20	40-50	2	± 40	Apr-Jun
		Aug-Sept						Sept-Oct
Cauliflower	6,0-6,5	Feb-Mar	0.2-0.3	45-70	60-90	1	98-161	Jun-Sept
Amaranth	5,5-7,5	Oct-Dec	0.5	20	50	1	100-150	Nov-Mar
Cowpea	5,5-6,5	Oct-Jan	1.2-2.4	10	45-100	4	90-120	Feb-June
Bambara	5,0-6,5	Oct-Feb	12	20-35	45	5-7,5	90-120	Jan-April
Pigeon Pea	5,0-7,0	Oct-Jan	1.5	30-45	35-60	4-6	100-300	Feb-June
Kale	6,0-6,5	Feb-Apr	0.2-0.3	20	50-60	1-2	±40	Apr-Jun
		Aug-Sept						Sept-Oct
Maize		Sep-Dec	1	50	100	4	120-150	Mar-Jun
Turnips	5.5-6.8	Mar-Jun	0.4	5-10	40	2	90-120	May-Sep
Brinjals	5,5-6,8	Aug-Nov	0.05	30-50	40	1-2	120-150	Jan-May
Ginger	6,0-6,5	Sep-Oct	15-20 stem pieces of 50 g	18	70 3 furrows per row	1.5	360-390	Aug-Sep

Fruit crops

Crop	Soil pH	Minimum temp (°C)	Planting time	Area needed per tree (m ²)	Spacing (m)		Pruning time	Growing period till fruiting	Harvesting time	Crop specific comments
					Inter plant	Inter row				
Papaya	6-6.5	12	Feb-Mar	1.5	1-2.5	2-3	Remove suckers which can damage fruit	±9 months	Aug - Dec	Male and female plants are needed
Mango	6 – 7.2	5	Aug-Sep	24	3	6	Not applicable	2 years	Jan - Mar	Many diseases and pests attack mango. Can tolerate hot climate
Banana	5.8 – 6.5	16	Oct - Dec	6	1.6	3	Remove unwanted suckers	12 months	Throughout the year	Cover bunches with bags
Litchi	5.7 – 6.8	6	Aug	36	6	9		6 years	Dec - Feb	Need enough water when flowering Feb/Mar
Citrus (naartjie, orange, lemons)	6-6.5	3	Aug	24	3	6	Not applicable	2 years	Apr -Aug	Water well during flowering (spring). 360 mm per year
Granadilla	5.7 – 6.8	5	Aug - Sep	1	2	2	Vines that become unproductive	6-9 months	Nov-Jan; Mar - Apr Jun-Jul	15l/plant in summer; 8l/plant in winter (depending on rain), Needs to be trellised
Guava	5 - 7	3	Sep	20	5	6	Pruned annually in Sep-Oct	2 years	Apr - May	Control fruit flies
Avocado cv. Fuerte	5.5 – 6.5	-2	Sep	25	3-5	5-10	Not applicable	3 years	Warm areas: Mar-Aug Cool areas May-Nov	Sensitive to waterlogging. Flowering sensitive to frost
Peach	4.5-5.5	-2	July	15	3	5	Winter& Summer	2-3 years	From end September to March	Water every 1-2 weeks

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					Inter plant	Inter row				
Apricot	4.5-5.5	-2	July	15	3	5	Winter & Summer	2-3 years	From mid November to mid December	Water every 1-2 weeks
Plum	4.5-5.5	-2	July	15	3	5	Winter & Summer	2-3 years	From November to end of March	Water every 1-2 weeks
Grape	5.5-6.5	-2	July	6	2	3	August	2-3 years	Mid November to end of March	Water every 1-2 weeks

Fruit trees needs addition of nutrients to the soil e.g. compost applied on top every 3 months



Applying enough water throughout the entire growing season of a crop helps to obtain good yields. Some crops need more water than others and following are general guidelines which should be adapted according to the season and age of crops.

Seedlings: The critical time is between sowing and emergence of the seedling. At all times the soil in contact with the seed must be moist.

Transplants: Watering before and after transplanting is essential, particularly in hot weather when young plants are unable to replace water lost from the leaves.

Leafy crops: Leaf crops (eg. cabbage, spinach) generally need about 25 litres per square meter a week and should be actively growing from the time they are sown or transplanted. In summer it may be better to split the water supply into two applications. More water should be given as crops approach maturity. However in cooler months (eg. winter) a single weekly watering is adequate.

Root crops: (eg. potatoes, carrots, sweet potato) The average weekly water requirement is between 10 and 15 litres per square meter. More may be needed as plants approach maturity. Regular watering must be maintained in the absence of rain and it is most important to ensure that water penetrates deeply into the soil. Shallow watering discourages good root development. Potatoes and sweet potatoes need additional water when tubers start forming.

Other crops: (eg green beans, green peas, pumpkin, tomato and cowpea) The average water requirement is 25 litre per square meter but varies according to the stage of development. A weekly watering, or an even longer period should be adequate until plants start flowering. Too much water up to this stage encourages excessive leaf growth.

Water efficient vegetables: (eg. cowpeas, amaranth, pigeon peas and bambara) These crops are known to be very tolerant to drought and can be grown under rain fed conditions if the rain is well distributed. Sweetpotato is moderately tolerant to drought.



The five steps of integrated pest management

1. Monitor for the presence of pests and pest damage, as well as disease symptoms (this is referred to as scouting).
2. Establish the density of the pest population and the severity of damage and symptoms
3. Decide whether the situation can be tolerated or should be corrected.
4. If correction is needed, apply treatment to reduce populations below threshold levels (level of damage which is of economical importance).
5. Evaluate the effect and efficacy of the treatment. Monitor for the presence of pests and pest damage, as well as disease symptoms (this is referred to as scouting).

Scouting involves walking through the garden to identify problems, evaluate the effectiveness of preventive measures, and establish the need for treatment. Scouting of crops is the foundation of a good disease and pest management program and should be done regularly, at least once per week.

If the crop is infected, examine a representative (evenly distributed throughout the plot/garden) sample of each crop to determine the average infestation level. The number of plants to examine can vary according to the type of crop and size of the planting. If there are only five or six plants per crop, all plants can be examined. If there are as many as 50 or more plants per crop, a sample of 10 plants can be examined. The best rule is to examine enough plants to feel comfortable about pests which are present and the severity of the damage. Diseases generally occur in patches. By mapping the location of these patches, all efforts can be concentrated to problem areas.

Choose a management strategy (see table) that will control and prevent the spread of the most important pests and diseases.

Table Integrated pest management to control pests and diseases

1. Use pest- and disease-resistant cultivars that are tolerant of existing soil or site conditions.
 2. Choose crops according to the season and location; crops grown in the wrong season or wrong location are more vulnerable to pests and diseases.
 3. Practice crop rotation to prevent build up of pests and diseases
 4. Brassica crops (cabbage, cauliflower, kale, cleome, mustard etc.) can be used for *biofumigation*, which is the use of biological active rotation and cover crops for suppressing soil-borne pests and diseases such as fusarium wilt, verticillium wilt, nematodes and bacterial wilt. Plant brassica crops in rotation with vitamin A-rich vegetable crops. Most brassica crops are cool weather crops and can be planted during winter. Plant a brassica crop and let it grow until maturity, Harvest the mature crop, leaving behind the outer leaves, stems and roots (this is called the plant rests). Dry the plant rests in the sun for two weeks (or longer depending on the weather). Incorporate the dried plant rests into the soil (30 cm) as green manure. It is important to allow at least 10 days before any crop is planted as it might harm the follow-up crop.
1. Improve the soil quality through
 - crop rotation (see section 4.2.4)
 - recycling crop residues and animal manure
 - reducing the use of chemical fertilizers and pesticides
 - increasing the use of cover crops and green manure.

The improved soil quality will help to maintain a high level of organic matter in the soil, and will

 - enhance soil fertility and productivity
 - increase drainage and water-holding capacity
 - protect the soil from erosion and nutrient run-off.
 2. Use the correct spacing between plants within a row as well as between rows. For example, if the spacing is too narrow, the canopy remains wet for longer, keeping in moist and thus making conditions more favourable for diseases that prefer low temperatures and high humidity.
 3. Use disease-free seed and planting material
 4. Remove infected plants (e.g. infected with virus diseases).
 5. Sanitation is a good preventative strategy.
 6. Remove all plant debris directly after harvesting
 7. Remove all objects (e.g. containers) that will provide shelter to insects
 8. Clean implements and equipment well (e.g. with Jik)
 9. Other insects, spiders, toads or birds may eat harmful insects. Natural enemies of pests (parasitic wasps, predacious bugs, beetles and spiders) exist everywhere in nature and should be preserved whenever possible.
 10. Insect-repellent plants such as mint, tomato, onion, chilli, garlic and marigolds can be cultivated in the home-garden to repel harmful insects