Emerald Seedlings

*A Brief Guide to Growing*

**Cabbages** (and other Brassicas)

**Introduction**
Cabbages (*Brassica oleracea var. capitata*) are grown throughout the year in Zimbabwe but highest yields are obtained under our cooler winter conditions. *This guide also applies to the other members of the Brassica family i.e. cauliflower and broccoli.*

**Climate**
The cabbage thrives under relatively cool, moist conditions. Should winter frosts occur, the cabbage is hardy, tolerating sub-zero temperatures especially when more mature. Specially bred summer cultivars will give good results if correctly managed in the Zimbabwean summer.

**Soil Requirements and Land Preparation**
Cabbages will grow in most soil types, but heavier soils are preferred. A pH of 6.0 to 6.5 (water) is considered optimum. Lime accordingly to your soil analysis results.

Drainage must be good, especially in the wet season, so it is recommended that cabbages be grown on beds or ridges. If it is a virgin land, cross rip and make up the beds. Ensure that fertilizer and manure are well incorporated into the bed to avoid banding and burning of the roots.

A permanent bed system should be seriously considered if a long-term horticulture project is envisaged.

**Rotation**
Preferably allow at least three years between cropping any brassicas off the same land. Never plant cabbages after another cruciferous crop e.g. broccoli, cauliflower, or brussel sprouts. If black rot has occurred do not use that land again for cruciferous crops though modern hybrid cultivars do offer good black rot tolerance.

**Cultivars**
Ensure that the cultivar you choose has the best marketing requirements with respect to colour and shape. Modern hybrid cultivars have been bred for specific seasons so ensure that you have the correct one. Star 3301 and 3311 are good summer cultivars with good black rot resistance and resistance to splitting whilst Star 3301 Star 3306 are excellent winter cultivars.

Cauliflower may require shading of the curds in summer to prevent sun scorch (purpling). This can be done by tying leaves over the head or breaking them over. This is largely cultivar dependent.

**Fertilizer**
As cabbages are gross feeders, they require heavy fertilizing of organic matter such as compost or manure to achieve the best results. It is important to apply only well broken down compost or manure as fresh can create problems in the way of nutrient deficiencies. **DO NOT APPLY ANY COMPOST OR MANURE THAT STILL SMELLS!**

A soil analysis is essential to understand the soil you are using and to get the best use out of the fertilizers applied. Submit a sample to a reputable laboratory at least 6 weeks before transplanting. Emerald Seedlings offers a free interpretation of the results to customers. All fertilizers should be applied according to the analysis. The table below is only a rough guide assuming a typical soil.

1. **Basal dressing**
   - 750 kg/ha compound 14:5:20 (ZFC "Coffeefer" - Maize Fertilizer will suffice if none other available)
   - 180 kg/ha single superphosphate if soil samples indicate a requirement.
   - 800 – 1200 kg/ha calcitic lime if required.
2. Top dressing

<table>
<thead>
<tr>
<th>Days from transplant (winter)</th>
<th>kg/ha AN</th>
<th>Days from transplant (summer)</th>
<th>kg/ha AN</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>75</td>
<td>14</td>
<td>75</td>
</tr>
<tr>
<td>14</td>
<td>75</td>
<td>28</td>
<td>75</td>
</tr>
<tr>
<td>21</td>
<td>75</td>
<td>45</td>
<td>75</td>
</tr>
</tbody>
</table>

Do NOT fertilize later than the above timings!

Populations
In Zimbabwe most growers plant between 35000 and 40000 plants per ha. Lower populations will give larger heads and higher populations will give higher yields per ha of smaller heads – check to see what your market prefers. Cauliflower and broccoli may be grown at a higher density if small heads are required.

Establishing seedlings
Your seed is best grown into seedlings by a reputable nursery. Do NOT direct sow and do not use a conventional seedbed as these methods will result in unacceptable losses in the land.

Ensure when transporting seedlings that they are protected from the sun and wind. If you need to store them do so in a cool shady place and ensure the seedlings are kept moist. Water the seedlings well before nightfall so that the foliage does not remain wet overnight as this is conducive to disease. Seedlings may be safely stored for 48 hours in this way.

Ensure the land is marked out in advance and plant into soil that is at field capacity. Ensure good soil to seedling plug contact and give a settling in irrigation of around 5mm immediately after planting. Irrigation demands thereafter are weather and plant size dependent. The seedlings will take a week to establish so check on them regularly during this period.

Irrigation
Do not stress the crop! Cabbages are gross users of water so must never be stressed. Aim to replace all that has evaporated from 6 weeks after transplanting through to maturity. This is best done with a Class A evaporation pan. Avoid fluctuating soil moisture near harvest as this can lead to splitting.

Bring the land up to field capacity before transplanting.

Harvesting
Note that cabbages may be held at maturity for up to 3 weeks in the land under cool conditions without suffering any quality losses. This does not apply to cauliflower and broccoli which have a considerably reduced (around 3 days for broccoli in summer) hold-over period.

Spray Programme
- Always read the label before applying an agrochemical.
- Take due precautions according to the color of the label.
- Make sure that application equipment is clean before and after use.
- Add suitable surfactant (wetter/sticker) to the mix to maximize efficacy.

<table>
<thead>
<tr>
<th>Note</th>
<th>Timing</th>
<th>Trade name</th>
<th>Active ingredient</th>
<th>Target</th>
<th>Rate per 100 litres mix</th>
<th>Pre-Harvest Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>transplanting</td>
<td>pyrethroid</td>
<td>pyrethroid</td>
<td>cutworm</td>
<td>see label</td>
<td>see label</td>
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<tr>
<td>2.</td>
<td>transplanting</td>
<td>Curaterr®/Furadan® 10 G</td>
<td>carbofuran</td>
<td>diamond-back moth larvae</td>
<td>1g per plant station</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>weekly</td>
<td>Copper oxychloride</td>
<td>copper oxychloride</td>
<td>general disease</td>
<td>300g</td>
<td>1</td>
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<tr>
<td>4a)</td>
<td>scouting</td>
<td>Dimethoate® @ 40 EC</td>
<td>dimethoate</td>
<td>aphids</td>
<td>100ml</td>
<td>21</td>
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<tr>
<td>b)</td>
<td></td>
<td>Metasystox® 25 EC</td>
<td>demeton-S-methyl imidacloprid</td>
<td></td>
<td>100g</td>
<td>10</td>
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<tr>
<td>c)</td>
<td></td>
<td>Confidor® 20 SL</td>
<td></td>
<td></td>
<td>40ml</td>
<td>14</td>
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<tr>
<td>5.a)</td>
<td>scouting</td>
<td>Biobit®/Dipel®</td>
<td>Bacillus thuringiensis</td>
<td>diamond-back moth</td>
<td>300ml</td>
<td>21</td>
</tr>
</tbody>
</table>
Notes:

1. Apply a coarse spray of pyrethroid over the top of the crop within 3 days from transplanting. See the label for rates.
2. Only necessary if transplanting from September through to March/April. Take due precautions as this is a purple label chemical. Stir granules into the hole with a stick to avoid root burn. This should give an effective protection of up to 6 weeks from application (do not apply post-planting).
3. Copper oxychloride is a general protectant. Apply with a suitable sticker/wetter as a full cover spray.
4. a). Apply the dimethoate as a full cover spray to control aphids. If the problem persists alternate with Metasystox® b), also as a full cover spray, after 14 days and/or Confidor® c). Observe the pre-harvest interval before cropping.
5. b,c). If diamond-back moth larvae persist after treatment with Curaterr®, use Fipronil® as a full cover spray. Alternate with Lufenuron® but do not apply the latter more than 6 times to a crop. If the problem persists. Biobit/Dipel is also effective as a full cover spray. Keep product cool as it is bioactive. Do not attempt to control the diamond back moths – it is their larvae that cause the damage.
6. Downy mildew can be a problem if wet weather persists. Use Dithane® as a full cover spray and repeat after 7 days if necessary. If control is still a problem use Ridomil® MZ (72% metalaxyl/mancozeb). Do not use more than 3 times.
7. Carbaryl® as a full cover spray will control most caterpillars but is not recommended for diamond-back moth larvae.

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**INDEMNITY.** All technical advice and/or production guidelines given by the author is given gratis based on his best judgment. However, it must be expressly understood that the author does not assume responsibility for any advice given or for the results obtained.

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### Responsible Pesticide Usage

1. All agricultural chemicals must be kept under lock and key and inaccessible to unauthorized personnel - this is a legal requirement.
2. Always read the label before use.
3. Get to know the common names/active ingredients of the chemicals being used e.g. diclorvos is the active ingredient of Dedevap®/DDVP®/Nogos®/Vapona® but the formulations may vary!
4. Where possible use systemic pesticides which will target specific pests and are much easier on the natural predators.
5. Synthetic pyrethroids (Karate/Fenvalerate etc.) are good for cutworm control and occasional use for other pests where nothing else is available. Otherwise they should be avoided.
6. Where repeated spraying is required to control a pest make sure to alternate with unrelated pesticides to avoid promoting resistance. More is NOT better! If a chemical does not work at the correct rate then use another. Likewise, do not be tempted to save money by using lower than the recommended rate – it will likely promote resistance.
7. Always comply with the PHI (pre-harvest interval) when applying pesticides.
8. Make sure the applicators are adequately protected when mixing and spraying. See the Zimbabwe Crop Chemical Handbook for requirements - it is available from ZFC.
9. Ensure that protective equipment is in good order and replaced regularly.
10. DO NOT allow applicators to eat, drink or smoke during chemical application or mixing.
11. Applicators should be checked for organophosphate levels (pseudo cholinesterase test) on a regular basis if they are being exposed to these chemicals.
12. Make sure application equipment is in good working order and replace wearing parts before they break. Spray nozzles should be replaced at least annually – they DO wear out!
13. There is no substitute for good scouting but a lot of pests can be anticipated under specific weather conditions.
14. Do not apply **stickers** with systemic pesticides – they inhibit the uptake of the pesticide by the plant. Use **spreaders/wetters** instead.