



# Healthy Harvests: Common Pests and Nutrient Deficiencies in Kenya's Horticultural Crops

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## Common Nutrient Deficiencies in Horticultural Produce

Nutrient	Deficiency Signs	Illustration	Corrective Action
<b>Nitrogen (N)</b>	Yellowing of older leaves, stunted growth, pale colour in leafy crops (spinach, cabbage)		Apply urea, CAN, or composted manure. Use split applications to avoid leaching.
<b>Phosphorus (P)</b>	Purplish or reddish leaf tinge, slow growth, poor root development (common in broccoli, carrots)		Apply DAP or TSP at planting. Incorporate into soil. Use rock phosphate in acidic soils.
<b>Potassium (K)</b>	Leaf edges scorched/burnt (cabbage, cauliflower), weak stems, poor resistance to stress		Apply MOP (muriate of potash) or wood ash. Foliar sprays can correct quickly.
<b>Calcium (Ca)</b>	"Tip burn" in cabbage/cauliflower curds, distorted young leaves, poor head formation		Apply agricultural lime or gypsum. Ensure steady irrigation to support uptake.
<b>Magnesium (Mg)</b>	Interveinal yellowing of older leaves (spinach, broccoli), leaf curling		Apply kieserite (MgSO <sub>4</sub> ) or dolomitic lime. Foliar Epsom salt spray for quick relief.
<b>Boron (B)</b>	Hollow stems in broccoli/cauliflower, cracked roots in carrots, poor curd/head quality		Apply Borax or Solubor at very low rates. Avoid overuse (toxic in excess).
<b>Iron (Fe)</b>	Interveinal chlorosis (yellowing) of young leaves (spinach most affected)		Apply foliar iron chelates (Fe-EDDHA) or ferrous sulphate. Improve drainage.

## Common Pests of Cabbage, Spinach, Broccoli, Cauliflower, Carrots

Crop	Pest	Signs & Symptoms	IPM-based Control	Illustration
Cabbage	Diamondback Moth	Small holes in leaves, "window-paning" effect, caterpillars hide on undersides	<ul style="list-style-type: none"> <li>- Rotate with non-crucifers</li> <li>- Use fine netting</li> <li>- Release parasitoid wasps (<i>Diadegma</i> spp.)</li> <li>- Neem-based product eg nimbecidine</li> <li>- As last resort use Coragen 20 SC or Atom 2.5 EC</li> </ul>	
	Cabbage Aphid	Clusters of gray-green aphids, curling leaves, sticky honeydew, sooty mold	<ul style="list-style-type: none"> <li>- Encourage ladybird beetles &amp; lacewings</li> <li>- Use yellow sticky traps</li> <li>- Spray neem based product eg nimbecidine</li> <li>- Use Karate Zeon (Karate 5CS / lambda-cyhalothrin) or Vanguisher 26 WDG</li> </ul>	
Spinach	Leaf Miner	White serpentine tunnels inside leaves, reduced photosynthesis	<ul style="list-style-type: none"> <li>- Remove infested leaves</li> <li>- Encourage natural enemies (parasitic wasps)</li> <li>- Use row covers</li> <li>- Neem products like nimbecidine</li> </ul>	
	Cutworms	Seedlings cut at ground level, wilting, poor establishment	<ul style="list-style-type: none"> <li>- Deep ploughing before planting</li> <li>- Apply wood ash around stems</li> <li>- Release <i>Trichogramma</i> spp.</li> <li>- Use light traps</li> <li>- Use neem product eg nimbecidine</li> </ul>	
Broccoli	Cabbage Worm (Cabbage white butterfly larvae)	Ragged leaf holes, green frass, caterpillars visible	<ul style="list-style-type: none"> <li>- Handpick larvae</li> <li>- Encourage birds</li> <li>- Spray <i>Bacillus thuringiensis</i> (Bt) formulations</li> <li>- Neem extracts like nimbecidine</li> <li>- Use Coragen last resort</li> </ul>	
	Flea Beetles	Small "shot holes" on leaves, stunted seedlings	<ul style="list-style-type: none"> <li>- Use sticky traps</li> <li>- Intercrop with onions/garlic</li> <li>- Neem extracts like nimbecidine</li> <li>- Mulching to deter</li> <li>- Karate Zeon (lambda-cyhalothrin) if need be</li> </ul>	
Cauliflower	Aphids (same as cabbage)	Leaf curling, honeydew, black sooty mold	<ul style="list-style-type: none"> <li>- Biological control (ladybirds)</li> <li>- Neem extracts eg nimbecidine</li> <li>- Reflective mulches</li> <li>- Karate Zeon (lambda-cyhalothrin)</li> </ul>	
	Root Maggot	Wilting, yellowing, weak plants, maggots on roots	<ul style="list-style-type: none"> <li>- Crop rotation</li> <li>- Use netting to block egg-laying flies</li> <li>- Beneficial nematodes</li> <li>- Chlorantraniliprole (Coragen)</li> </ul>	
Carrots	Carrot Rust Fly	Maggots tunnel into roots, rusty-brown scars	<ul style="list-style-type: none"> <li>- Crop rotation</li> <li>- Use row covers</li> <li>- Delay planting</li> <li>- Apply neem-based soil drenches</li> </ul>	
	Aphids	Curling leaves, stunted growth	<ul style="list-style-type: none"> <li>- Encourage predators</li> <li>- Intercrop with strong-smelling herbs (coriander, garlic)</li> <li>- Neem extracts like nimbecidine</li> <li>- Karate Zeon (lambda-cyhalothrin)</li> </ul>	

## Common Diseases of Cabbage, Spinach, Broccoli, Cauliflower, Carrots

Crop	Disease	Signs & Symptoms	IPM-based Control	Illustration
Cabbage	Black Rot	Yellow V-shaped lesions, black veins, leaf drop	<ul style="list-style-type: none"> <li>- Use resistant varieties</li> <li>- Crop rotation</li> <li>- Remove infected debris</li> <li>- Copper-based chemical products as last resort e.g copper oxychloride, copper hydroxide like Bordeaux mix sprays</li> </ul>	
	Downy Mildew	Yellow patches above leaves, white fluffy mold underside	<ul style="list-style-type: none"> <li>- Plant in well-drained soils</li> <li>- Avoid overhead irrigation</li> <li>- Use resistant varieties</li> <li>- Fungicide sprays only if severe</li> <li>- Chemical products such as Ridomil or products with mfenoxam</li> </ul>	
Spinach	Damping Off	Seedlings rot at base, collapse before maturity	<ul style="list-style-type: none"> <li>- Use sterilized trays/media</li> <li>- Avoid overwatering</li> <li>- Apply <i>Trichoderma</i> formulations in nursery</li> </ul>	
	Downy Mildew	Yellow spots, purple-gray mold underside of leaves	<ul style="list-style-type: none"> <li>- Good spacing for airflow</li> <li>- Avoid overcrowding</li> <li>- Resistant varieties</li> <li>- Biological fungicides</li> <li>- Use Ridomil or mfenoxam products</li> </ul>	
Broccoli	Alternaria Leaf Spot	Brown concentric spots on leaves, defoliation	<ul style="list-style-type: none"> <li>- Rotate crops</li> <li>- Remove debris</li> <li>- Spray bio-fungicides (<i>Trichoderma</i>, <i>Bacillus subtilis</i>)</li> <li>- De-methylation inhibitors (e.g., difenoconazole, tebuconazole)</li> </ul>	
	Clubroot	Swollen distorted roots, stunted plants, wilting	<ul style="list-style-type: none"> <li>- Raise soil pH with lime</li> <li>- Rotate with cereals</li> <li>- Solarize nursery soil</li> </ul>	
Cauliflower	Black Rot (same as cabbage)	V-shaped lesions, black veins	<ul style="list-style-type: none"> <li>- Resistant varieties</li> <li>- Crop hygiene</li> <li>- Copper sprays if severe eg Bordeaux spray</li> </ul>	
	Alternaria Leaf Spot	Dark spots on curds and leaves	<ul style="list-style-type: none"> <li>- Crop rotation</li> <li>- Destroy residues</li> <li>- Use biocontrol sprays</li> <li>- Triazole chemical controls if need be (difenoconazole/tebuconazole)</li> </ul>	
Carrots	Alternaria Leaf Blight	Yellow-brown lesions on leaf margins, defoliation	<ul style="list-style-type: none"> <li>- Rotate crops</li> <li>- Plant resistant varieties</li> <li>- Use neem-based fungicides</li> <li>- If severe use other difenoconazole, tebuconazole, azoxystrobin products</li> </ul>	
	Powdery Mildew	White powdery growth on leaves, reduced yield	<ul style="list-style-type: none"> <li>- Use sulfur dusting</li> <li>- Neem sprays</li> <li>- Avoid dense planting</li> <li>- If severe use sulfur compounds and triazoles</li> </ul>	