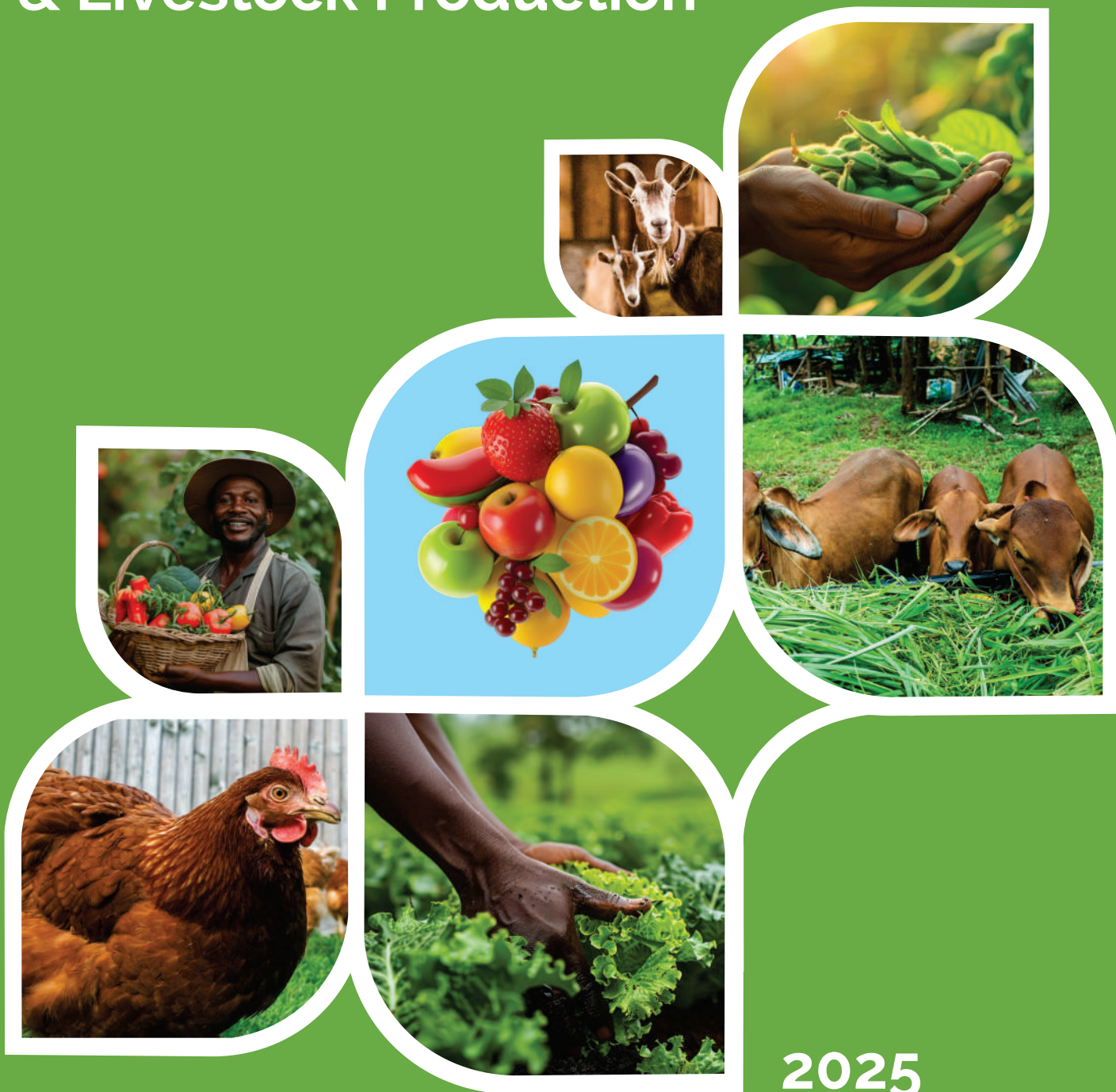


# Organic and Bio-Inputs in Kenya: Commercial Products & Farmer Innovations for agroecological Crop & Livestock Production



2025





**Organic and Bio-Inputs in Kenya:  
Commercial Products & Farmer  
Innovations for agroecological Crop  
& Livestock Production**

**2025**





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# Forward

**A**s Kenya's agriculture sector confronts the growing threats of soil degradation, climate variability, pest and disease outbreaks and rising input costs, the urgency to transition toward sustainable and resilient farming systems has never been greater. Organic and bioinputs — ranging from compost, biofertilizers, biopesticides, herbal remedies and farmer-led innovations — present practical, scalable solutions that not only restore soil health but also strengthen climate resilience across both crop and livestock systems.

The compilation presented in this report comes at a pivotal moment. By documenting both commercially available products and indigenous farmer innovations, it offers an invaluable resource for practitioners, researchers, policymakers and

development partners committed to promoting climate-resilient agriculture. Organic inputs enhance soil carbon sequestration, improve water retention and reduce reliance on fossil fuel-based synthetic inputs, thus mitigating greenhouse gas emissions while improving productivity and farmer incomes. Equally, the promotion of plant-based veterinary remedies addresses rising concerns of antimicrobial resistance in livestock production.

Scaling the adoption of organic inputs is not only an environmental necessity but a development imperative that protects farmer health, safeguards ecosystems and builds long-term food system stability. This collection underscores the wealth of local knowledge and private sector innovation that, if supported by enabling policies and investment, can position Kenya as a leader in climate resilient, regenerative agriculture.



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# The purpose and structure of this compendium

**T**his compendium serves as a timely resource to support Kenya's transition towards climate-resilient agriculture by documenting a rich diversity of organic and bioinputs — both commercially available products and traditional farmer innovations — used across the crop and livestock sectors. As climate change accelerates the degradation of Kenya's soils, disrupts pest and disease cycles and threatens agricultural productivity, scaling the use of organic inputs has become an urgent priority for safeguarding food security, restoring soil health and building long-term resilience.

The manual targets multiple audiences. It is intended to empower farmers and practitioners already using or seeking to adopt these solutions. It also serves scientists, extension officers, policy makers, development partners, and civil society organizations that are keen to understand, research, validate and scale effective organic input innovations within their communities and programs. In particular, the manual offers a valuable knowledge base for advancing both scientific inquiry into the efficacy of organic and biopesticidal practices and for guiding farmer-centered interventions that can accelerate the adoption of these practices on a larger scale.

The report is structured into three sections:

- The first section documents commercially available organic and bioinputs currently registered or marketed in Kenya for soil health management, pest and disease control in crops and animal health management. This includes a wide range of products such as biofertilizers, biopesticides, biostimulants, organic foliar fertilizers, botanical veterinary remedies and insect and plant-based animal feed supplements

**As climate change accelerates the degradation of Kenya's soils, disrupts pest and disease cycles and threatens agricultural productivity, scaling the use of organic inputs has become an urgent priority.**





- The second section captures farmer-led innovations and traditional practices used by Kenyan smallholders to manage soil fertility, crop pests and livestock diseases, utilizing locally available plants and natural substances such as neem, tithonia, wild sage, pyrethrum, garlic, chili and many others
- The third section provides additional resources for further reading, including databases such as Infonet, a channel of the Biovision Farmer Communication Programme (FCP), that provides scientific and practical validated information and knowledge related to plant (crop), animal, human and environmental health, the Agroforestry Database and the Tree Seed

Suppliers Directory, offering information on plant species distribution, seed sourcing, and additional knowledge on sustainable pest management and soil fertility solutions among others.

The information presented was compiled from an extensive review of published literature, consultation with civil society organizations actively promoting these innovations, direct engagement with farmer communities and information provided by commercial bioinput suppliers. While every effort was made to ensure accuracy, this manual is intended as a guide and users are encouraged to validate specific treatments and diagnoses with trained agricultural and veterinary professionals.





# Acknowledgement

**T**his assemblage was developed through the collaborative efforts of PELUM Kenya, BIBA Kenya and the Effective IPM Association, with funding support from Agroecology Fund (AEF) under the project “Strengthening Climate Resilience by Scaling Up Agroecology: Collaborative Research and Advocacy to Advance Food System Transformation.” The dedication and technical contributions of all project partners have been instrumental in the successful completion of this work.

We sincerely acknowledge the diverse individuals, organizations and institutions that contributed valuable knowledge, experience and data to this compilation. Special appreciation goes to the civil society organizations actively promoting farmer-led agroecological innovations, including GBIACK, COSDEP, CSHEP, Vihiga Community Nutrition and Seed Bank Community-Based Organization and to ICRAF (World Agroforestry Centre) for their access to resources on pesticidal plants and traditional ethnoveterinary medicine. We also extend our gratitude to the many bio-input companies and private sector partners who generously shared information on their products, enriching the commercial bioinput database presented in this anthology. In addition, we recognize the valuable scientific resources from the OPTIONS (Optimizing Pesticidal Plants: Technology, Innovation, Outreach and Networks) project, whose research and outreach work on pesticidal plants has significantly informed parts of this compilation.

The knowledge contained in this manual represents a collective effort from a wide network of practitioners, researchers, farmers and stakeholders committed to advancing climate-resilient, agroecological farming systems in Kenya and beyond.

**We sincerely  
acknowledge the  
diverse individuals,  
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# 1

# COMMERCIAL ORGANIC AND BIO-INPUTS AVAILABLE IN KENYA



## 1.1 Soil health and crop nutrition products

### 1.1.1 Commercial organic and bio fertilizers

Product trade name	Company and contact details	Use and rate of application	Visual/label
<b>Black Gold</b>	Organic Kenya Limited Wang'uru +254 725 135 150 info@organickenya.co.ke	<ul style="list-style-type: none"> <li>Planting fertilizer.</li> <li>For vegetables: apply 1-1.5 kg per 10 square meters.</li> <li>Flower Beds: Use 0.5-1 kg per 10 square meters.</li> <li>For farms: Spread 5-7.5 kg per 100 square meters.</li> </ul>	
<b>Evergrow organic fertilizer</b>	Sanergy LTD, Nairobi info@farmstar.co.ke Tel: +254 718 800 330	<ul style="list-style-type: none"> <li>Evergrow can be used on any crop. It is particularly recommended on horticultural crops, e.g. Tomatoes, capsicum, onions, French beans, flowers, etc. and other high value seasonal crops like coffee, tea, rice, wheat, etc.</li> <li>Use as an in-row basal dressing at a rate of 500kg per acre.</li> </ul>	
<b>Evergrow Korn-Kali</b>	Sanergy LTD, Nairobi info@farmstar.co.ke Tel: +254 718 800 330	<ul style="list-style-type: none"> <li>Suitable for all crops, particularly those that require higher potassium nutrition, e.g. tomatoes, potatoes, onions, watermelon, and many more.</li> <li>Transplanting: 100kgs Yara Power + 100kgs Evergrow Korn-Kali</li> <li>1st Topdress: 75kgs Yara winner + 25kgs NPK 23:23 + 50kgs Evergrow Korn-Kali</li> </ul>	
<b>Mazao FLOURISH</b>	The Reall IPM Co. (Kenya) Ltd P.O. Box 4001-01002 Makadara, Thika, Kenya TEL +254 (0)725 806086, General enquiries: info. realipm@biobestgroup. com SALES ORDERS: sales. realipm@biobestgroup. com	<ul style="list-style-type: none"> <li>Liquid biofertiliser for promoting growth and yield of horticultural crops.</li> <li>For seeds, start by bio priming if possible.</li> <li>Follow up with at least 2 – 3 drenches after emergence or after transplanting shock is over at a rate of 100ml/20L knapsack for heavy feeders and or 50ml/20L knapsack for light feeders.</li> </ul>	
<b>Mazao+ organic fertilizer</b>	Nutrimzuri Farmcare Ruai, Nairobi, Kenya Email: info@nutrimzuri. co.ke Contact: +254 726 811 123	<ul style="list-style-type: none"> <li>Ideal for Coffee, Maize, Beans, sukuma wiki, Tomatoes, Spinach, Cabbage, capsicum, Onions, Watermelon, Avocado, Macadamia, Potatoes, Garden plants, Muguka, etc.</li> </ul>	





Product trade name	Company and contact details	Use and rate of application	Visual/label
<b>Griincom organic fertilizer</b>	Griincom Greensteds, Nakuru. +254 722 861 885 info@griincom.co.ke	<ul style="list-style-type: none"> <li>Griincom Organic Fertilizer is used during planting.</li> <li>Apply one handful (about 200g) per plant. This is equal to three bags of 50kg of Griincom Organic Fertilizer per acre of land. It is advisable for the first time to use a higher ratio of 4 bags then reduce to 3 and eventually 2 – 1 with continued usage.</li> </ul>	
<b>Safi Organics fertilizer premium planting</b>	Safi Organics Wang'uru +254 (0) 725-778-829 info@safiorganics.co.ke	<ul style="list-style-type: none"> <li>Used as a basal fertilizer for planting due to its rich phosphorus content.</li> <li>Used for various crops like maize, rice, wheat, beans, vegetables, fruits, flowers, and grasses.</li> </ul>	
<b>Safi Organics fertilizer premium topper</b>	Safi Organics Wang'uru +254 (0) 725-778-829 info@safiorganics.co.ke	<ul style="list-style-type: none"> <li>Suitable as a top-dressing fertilizer due to its high nitrogen content.</li> </ul>	
<b>Eco Planting mix organic fertilizer</b>	Ecofix Kenya Limited Nanyuki +254 712 684160 info@efk.co.ke	<ul style="list-style-type: none"> <li>Specialized compost for planting</li> <li>Application Rate: -200g/meter.sq</li> </ul>	
<b>Eco top-dress organic fertilizer</b>	Ecofix Kenya Limited Nanyuki +254 712 684160 info@efk.co.ke	<ul style="list-style-type: none"> <li>Specialized compost for topdressing</li> <li>Application Rate: 200g/meter.sq</li> </ul>	
<b>Kijani vermicompost</b>	Dudu Masters Limited Kutus +254 702 444 562 info@dudumasters.com	<ul style="list-style-type: none"> <li>Granulated organic fertilizer.</li> <li>Application rate 50kgs per acre.</li> </ul>	
<b>Hygrow organic fertilizer</b>	Organic Fields RUIRU - Bypass – Kenya info@organicfields.co.ke +254791355137	<ul style="list-style-type: none"> <li>Organic Fertilizer for indoor and outdoor plants</li> </ul>	








Product trade name	Company and contact details	Use and rate of application	Visual/label
<b>Biodama</b>	Organic Fields RUIRU - Bypass – Kenya info@organicfields.co.ke +254791355137	<ul style="list-style-type: none"> <li>Organic bio fertilizer for indoor and outdoor plants</li> </ul>	
<b>Organic Copper Power</b>	Organic Fields RUIRU - Bypass – Kenya info@organicfields.co.ke +254791355137	<ul style="list-style-type: none"> <li>Indoor and outdoor plants copper deficiency corrector formulated with organic acids.</li> </ul>	





### 1.1.2 Commercial foliar fertilizers

Product trade name	Company and contact details	Use and application rate	Visual/label
<b>Wonder organic foliar</b>	Organic Kenya Call: +254 725 135 150 info@organickenya.co.ke	<ul style="list-style-type: none"> <li>Liquid foliar fertilizer</li> <li>For general use: Mix 30-60 ml per 10 liters of water and spray on foliage.</li> <li>For vegetables: Apply every 7-14 days during the growing season.</li> <li>Ornamentals: Use once a month for continuous blooms.</li> </ul>	
<b>Griincom organic foliar</b>	Griincom Greensteds, Nakuru. +254 722 861 885 info@griincom.co.ke	<ul style="list-style-type: none"> <li>Griincom Organic foliar is used as a foliar fertilizer.</li> <li>Mix 100ml in 20 litres water.</li> </ul>	
<b>Griincom Organic foliar Plant Boost Microorganism</b>	Griincom Greensteds, Nakuru. +254 722 861 885 info@griincom.co.ke	<ul style="list-style-type: none"> <li>Griincom Organic foliar Plant Boost Microorganism is used as a foliar fertilizer.</li> <li>Mix 5 litres in 200litres of water.</li> </ul>	
<b>Safi foliar fertilizer</b>	Safi Organics +254 (0) 725-778-829 info@safiorganics.co.ke	<p>Foliar fertilizer for:</p> <ul style="list-style-type: none"> <li><b>Boosting Root Development:</b> Safi Foliar Liquid Fertilizer encourages robust root growth, setting a strong foundation for your crops.</li> <li><b>Promoting Healthier Crops:</b> Our organic formula ensures your plants receive the nutrients they need for optimal health and vitality.</li> <li><b>Rapid Nutrient Correction:</b> Quickly addresses any nutrient deficiencies with fast-acting, targeted nutrition.</li> <li><b>Balanced Nutrition Delivery:</b> Provides a precise balance of nutrients directly to your crops, enhancing overall growth.</li> </ul>	


Product trade name	Company and contact details	Use and application rate	Visual/label
<b>Crovil biostimulant and synergist</b>	Ecofix Kenya Limited +254 712 684160 info@efk.co.ke	<ul style="list-style-type: none"> <li>Foliar spray &amp; drenching for promoting vigorous root and shoot development and increasing efficacy of the organic and synthetic pesticides as a synergist/ penetrant in foliar and soil applications.</li> <li><b>Dilution Rate:</b> 4ml/litre of water for foliar spray</li> <li>8ml/litre of water for drenching</li> </ul>	
<b>Champion Organic Foliar Fertilizer</b>	Organic Fields RUIRU - Bypass – Kenya info@organicfields.co.ke +254791355137	<ul style="list-style-type: none"> <li>Liquid organic foliar fertilizer for indoor and outdoor plants</li> </ul>	
<b>Stopgel foliar</b>	Rue Organics Dynamic Mall, Ground Floor, Shop SL28, Tom Mboya Street, Nairobi  0725 600 710 Info@rueorganics.co.ke	<ul style="list-style-type: none"> <li>Foliar fertilizer cum biopesticide.</li> <li>Controls most common farm and domestic pests including but not limited to:- Farm pests- Fall army worm in maize and other crops, tuta absoluta in tomatoes, caterpillars affecting different crops, mealy bugs affecting pawpaws, coffee, legumes and fruit trees. Thrips' and mites' eggs hence breaking their life cycle.</li> <li><b>Mixing rate:</b> 100mls in 20 litres of water</li> </ul>	 <p><b>NEW</b></p> <p><b>RUE Organics</b></p> <p><b>STOPGEL FOLIAR FERTILIZER CUM BIOPESTICIDE</b></p> <p>100% Biodegradable, non-toxic, non-harmful to humans and domestic animals. It is a natural product that is safe for use on all crops and animals. It is a natural product that is safe for use on all crops and animals. It is a natural product that is safe for use on all crops and animals.</p> <p><b>MODE OF ACTION:</b> Stopgel is a natural product that is safe for use on all crops and animals. It is a natural product that is safe for use on all crops and animals. It is a natural product that is safe for use on all crops and animals.</p> <p><b>PRODUCT CHARACTERISTICS:</b> Stopgel is a natural product that is safe for use on all crops and animals. It is a natural product that is safe for use on all crops and animals. It is a natural product that is safe for use on all crops and animals.</p> <p><b>FALL ARMYWORM</b> <b>TUTA ABSOLUTA</b></p>
<b>Rue-Fungalsol organic foliar</b>	Rue Organics Dynamic Mall, Ground Floor, Shop SL28, Tom Mboya Street, Nairobi  0725 600 710 Info@rueorganics.co.ke	<ul style="list-style-type: none"> <li>Organic foliar feed containing biological sulphur which is nutritive in nature.</li> <li>Assists the plant to develop its own defense mechanism through out the four levels of growth.</li> <li><b>Level1:</b> Fungalsol helps the seedling in it's photosynthesis process where it's life begins.</li> <li><b>Level 2:</b> Fungalsol helps the plant to synthesize proteins during the plant's vegetative growth stage allowing it to develop its immune system against diseases.</li> <li><b>Level 3:</b> Fungalsol actively helps the plant in lipid formation, a natural crop protection mechanism against high pest infestation by growing hairs around stem and branches.</li> <li><b>Level 4:</b> Fungalsol assists in plant hormonal formation at maturity stage enabling to facilitate optimum productivity.</li> </ul>	 <p><b>NEW</b></p> <p><b>RUE-FUNGALSOL</b></p> <p>Organic Foliar</p> <p>100% Biodegradable, non-toxic, non-harmful to humans and domestic animals. It is a natural product that is safe for use on all crops and animals. It is a natural product that is safe for use on all crops and animals. It is a natural product that is safe for use on all crops and animals.</p>








Product trade name	Company and contact details	Use and application rate	Visual/label
<b>Ruemax NPK</b>	Rue Organics Dynamic Mall, Ground Floor, Shop SL28, Tom Mboya Street, Nairobi  0725 600 710 Info@rueorganics.co.ke	<ul style="list-style-type: none"> <li>A high Nitrogen, Phosphorus, and Potassium Foliar Fertilizer.</li> <li>RUEMAX composition:</li> <li>NPK 24-24-20+0.2%MgO, Humic acid + trace elements: B, Fe, Cu, Zn, Mn, Mo.</li> <li>Best for avocado, coffee, rice, vegetables/horticulture, cereals, fruit trees &amp; lawns.</li> </ul>	
<b>M-Forte</b>	Rue Organics Dynamic Mall, Ground Floor, Shop SL28, Tom Mboya Street, Nairobi  0725 600 710 Info@rueorganics.co.ke	<ul style="list-style-type: none"> <li>A liquid soil bio-stimulant cum foliar fertilizer containing fortified bioactive microbes that replenishes soil health by replacing lost soil microorganisms caused by use of synthetic fertilizers over time.</li> <li><b>Mixing rate:</b> 200mls in 20 litres of water</li> </ul>	
<b>Rue-Sil fruit and flower.</b>	Rue Organics Dynamic Mall, Ground Floor, Shop SL28, Tom Mboya Street, Nairobi 0725 600 710 Info@rueorganics.co.ke	<ul style="list-style-type: none"> <li>An Organic foliar fertilizer containing silica and balanced plant nutrients to enhance flower and fruit quality.</li> <li>Spray during flowering and fruit development stage of plant growth.</li> <li><b>Mixing rate:</b> 100mls in 20 litres of water</li> </ul>	
<b>Rue-Calciummax foliar</b>		<ul style="list-style-type: none"> <li>Foliar fertilizer for correcting calcium deficiency in tomatoes, capsicum and other crops.</li> </ul>	
<b>InBio DOLOMITE</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>A liquid fertiliser high in Calcium and Magnesium for plant health and enhanced early-stage plant development in a variety of crops.</li> <li>Rate of application varies depending on crop.</li> <li>Check product sheet for more information.</li> </ul>	
<b>AGROFEED® PLUS</b>	Osho Chemicals (+254)0711 045 000 (+254)0732 167 000 customercare@oshochem.com	<ul style="list-style-type: none"> <li>Liquid compound foliar fertilizer and plant booster</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>Coffee, potatoes, tomatoes, ornamentals, pineapples, fruit trees, rice, maize.</li> <li>50ml/20ltrs water (2.5 L/Ha)</li> <li>Wheat &amp; barley</li> <li><b>Rates:</b> 100ml/20ltrs water (2.5 L/Ha)</li> </ul>	







Product trade name	Company and contact details	Use and application rate	Visual/label
<b>Defender B - 1 Litre</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Foliar fertilizer containing boron</li> </ul>	
<b>Defender Ca - 1 Litre</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Foliar fertilizer containing calcium</li> </ul>	
<b>Defender K - 1 Litre</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Foliar fertilizer containing potassium</li> </ul>	
<b>Defender Mg - 1 Litre</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Foliar fertilizer containing magnesium</li> </ul>	
<b>InBio CALBUD</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>A liquid fertiliser high in Calcium with synergistically balanced macro and micro nutrients for enhanced early-stage plant development.</li> <li>Check product sheet for application rate and instructions.</li> </ul>	-
<b>InBio GYPSUM</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>A liquid fertiliser high in Calcium and Sulphur for improving soil structure by reducing sodium build up and increasing calcium levels.</li> <li>Due to the very small particle size InBio GYPSUM has a fast reactivity rate and works as a fast-acting soil amendment, conditioner, and fertilizer.</li> <li>Read product information sheet for details for application rate and instructions.</li> </ul>	-
<b>InBio LIME</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>A highly concentrated fully water dispersible liquid fertiliser containing a high percentage of Calcium to ensure strong early plant development.</li> <li>Application rate varies with crop. Used as a foliar or fertigation.</li> <li>Read product information sheet for details on application rate and instructions.</li> </ul>	-



Product trade name	Company and contact details	Use and application rate	Visual/label
<b>Biorise SL</b>	Bio Organic Ltd. info@bioorganic.co.ke +254 792 458 379	<ul style="list-style-type: none"> <li>Liquid bio-fertilizer promoting plant growth and resilience.</li> <li>Application Rate (100L/H)</li> </ul>	
<b>Microfert Ti</b>	Agrifarm Biologicals Limited. Tel: 020-2418600, Mobile: +254-771-206901/2, +254-722-206902, +254-774-206900, +254-733-336902 Email: Info@Thikawaxworks.com	<ul style="list-style-type: none"> <li>A micronutrient fertilizer for supplementing micronutrients requirement by plants for optimal biological activities.</li> </ul> <p><b>Rate</b></p> <ul style="list-style-type: none"> <li>20ml in 20Lts;</li> <li>1L in 1000Lts/Ha</li> </ul>	-





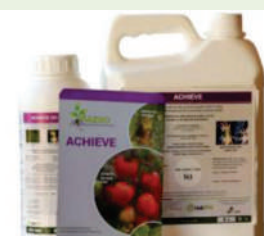
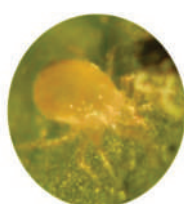
### 1.1.3 Commercial soil conditioners and bio stimulants

Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Wonder organic multipurpose soil conditioner</b>	Organic Kenya Wang'uru Call: +254 725 135 150 info@organickenya.co.ke	<ul style="list-style-type: none"> <li>Liquid soil conditioner</li> <li><b>General Use:</b> Mix 60-90 ml per 10 liters of water and apply to soil.</li> <li><b>Farms:</b> Use 120-180 ml per 100 square meters.</li> <li><b>Gardens:</b> Apply 1-2 times per month during the growing season.</li> </ul>	
<b>Safi Biochar acidic soil amender</b>	Safi Organics Wang'uru +254 (0) 725-778-829 info@safiorganics.co.ke	<ul style="list-style-type: none"> <li>Acts as a liming fertilizer, enhancing soil fertility by neutralizing acidity.</li> </ul>	
<b>Biochar4Life</b>	JJelens Ltd Park Court 01, Ojjo Road P.O. BOX 54388 - 00200, Nairobi. Kenya +254 11 431 435 info@jjelens.com	<ul style="list-style-type: none"> <li>A slow -release high carbon soil conditioner that heals your soils over a period of time.</li> </ul>	
<b>CKC Rhizoflo</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Bio-fertilizer containing Rhizobium bacteria that promote Nitrogen and Phosphorus solubilisation for improved plant performance.</li> <li><b>Bio control agent:</b> Pseudomonas fluorescens and Azospirillum brasilense</li> <li><b>Category:</b> Beneficial Bacteria, Nutrition</li> <li><b>Target challenge:</b> Enhanced crop development, Enhanced root development</li> </ul>	
<b>CKC Vetch</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>CKC Vetch, Peas and Lentils is a seed dressing composed of strains of Rhizobium bacteria selected for their infectivity and capacity of Biological Nitrogen Fixation (BNF).</li> </ul>	





Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Veni Prisma Biofertilizer</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Veni Prisma shortens the crop cycle which results in earlier harvest. It stimulates root development which results in the development of healthier and more robust plants.</li> <li><b>Foliar spray:</b> 1-2L/ha depending on spray water volume</li> <li><b>Irrigation:</b> 1L/ha regardless of irrigation water volume</li> </ul>	
<b>Vidi Fortum Ascophyllum nodosum</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Vidi Fortum stimulates soil life around the roots and improves abiotic stress resistance.</li> <li>Application rates typically range from 3-5 liters/ha</li> </ul>	
<b>Vidi Funda Mixture of milled legumes, maize, seaweed extract and minerals</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Vidi Funda restores and maintains the natural balance and the disease suppressiveness of the soil.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>250-500 kg/ha, or 2-3 kg/m3 of substrate</li> </ul>	
<b>Vidi Parva Tryptophan and other free amino acids in herbal extract</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Biostimulant</li> <li>Application rates typically range from 3-5 litres/ha</li> </ul>	
<b>BLACKEARTH® 85 WSG</b>	Osho Chemicals (+254)0711 045 000 (+254)0732 167 000 customer@oshochem.com	<ul style="list-style-type: none"> <li>Water soluble soil amendment and blend.</li> <li>Helps to make Phosphorous available to plants, prevents leaching and improves soil structures.</li> <li><b>Rate of use:</b> Mix 1-1.5Kg / 50kg of fertiliser.</li> </ul>	
<b>InBio TRACE</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>A high analysis suspension of Manganese, Zinc, Iron, Magnesium and Copper blended with kelp extracts. Designed to provide an early energy boost for early vigour and improved plant health.</li> <li><b>Application:</b> seed dressing, foliar, fertigation &amp; aerial application</li> <li>Read product sheet for application rate.</li> </ul>	-
<b>Citogrower - 250ML</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Stimulates cell division and elongation, promoting healthier plants and increased crop production.</li> </ul>	
<b>Asilee</b>	Organix Limited eco@organix agro.com +254 720 937 535 / +254 735 712 090	<ul style="list-style-type: none"> <li>Soil conditioner made from organic ingredients; improves soil texture and fertility.</li> </ul>	-

Product trade name	Company and contact details	Use/purpose	Visual/label
Earthlee	Organix Limited eco@organix agro.com +254 720 937 535 / +254 735 712 090	<ul style="list-style-type: none"> <li>Humate-based organic soil humus powder for restoring degraded soils and improving fertility.</li> <li>Apply 200kg - 400kg per Hectare as required</li> </ul>	-








## 1.2 Commercial organic and biopesticides

Product trade name	Company and contact details	Use/purpose	Visual/label
Real Amblyseius Californicus	THE REAL IPM CO.(KENYA) LTD TEL +254 (0)725 806086, info.realipm@biobestgroup.com sales. realipm@biobestgroup.com	<ul style="list-style-type: none"> <li>Contains a predatory mite \ Amblyseius Californicus for the management of spidermites.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>5 – 10 predatory mites per square meter.</li> </ul>	
TriCoat	THE REAL IPM CO.(KENYA) LTD TEL +254 (0)725 806086, info.realipm@biobestgroup.com sales. realipm@biobestgroup.com	<ul style="list-style-type: none"> <li>Protects the plant roots from attack by soil borne</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>Sprinkling water onto the seeds to slightly wet them, add TriCoat powder and mix thoroughly for even coat, air dry under shade for 30 minutes then plant.</li> </ul>	
Mazao REGAIN®	THE REAL IPM CO.(KENYA) LTD TEL +254 (0)725 806086, info.realipm@biobestgroup.com sales. realipm@biobestgroup.com	<ul style="list-style-type: none"> <li>Bio-fungicide for the control of powdery mildew.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>Apply 2 liter/ha</li> </ul>	
Mazao Sustain®	THE REAL IPM CO.(KENYA) LTD TEL +254 (0)725 806086, info.realipm@biobestgroup.com sales. realipm@biobestgroup.com	<ul style="list-style-type: none"> <li>Bio-pesticide formulated from Trichoderma asperellum for the control of soil borne Pest</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>200 ml / ha</li> </ul>	
Mazao ACHIEVE®	THE REAL IPM CO.(KENYA) LTD TEL +254 (0)725 806086, info.realipm@biobestgroup.com sales. realipm@biobestgroup.com	<ul style="list-style-type: none"> <li>Contact bio-insecticide composed of one isolate of the entomopathogenic fungus, Metarhizium anisopliae ICIPE 78.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>1 L – 2 L / Ha</li> </ul>	
Real Amblyseius andersoni	THE REAL IPM CO.(KENYA) LTD TEL +254 (0)725 806086, info.realipm@biobestgroup.com sales. realipm@biobestgroup.com	<ul style="list-style-type: none"> <li>The predatory mite eats adult spider mites, eggs and nymphs.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>50-100 individuals/ M<sup>2</sup></li> </ul>	














Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Real Amblyseius cucumeris</b>	THE REAL IPM CO.(KENYA) LTD TEL +254 (0)725 806086, info.realipm@biobestgroup.com sales. realipm@biobestgroup.com	<ul style="list-style-type: none"> <li>Contains a predatory mite <i>Amblyseius cucumeris</i> a predator of Thrips.</li> </ul> <b>Application:</b> <ul style="list-style-type: none"> <li>25–30 individuals per 1 m<sup>2</sup></li> </ul>	
<b>Real Phytoseiulus persimilis</b>	THE REAL IPM CO.(KENYA) LTD TEL +254 (0)725 806086, info.realipm@biobestgroup.com sales. realipm@biobestgroup.com	<ul style="list-style-type: none"> <li>Contains a predatory mite <i>Phytoseiulus persimilis</i> for the management of the two-spotted mite (<i>Tetranychus urticae</i>).</li> </ul>	-
<b>Beauvitech® WP</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Aphids, Coffee Berry Borer, Leafminers, Mealybugs, Scale Insects, Thrips, Whiteflies</li> </ul>	
<b>Lecatech® WP</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Aphids, Leafminers, Mealybugs, Scale Insects, Thrips, Whiteflies</li> </ul>	
<b>Mytech® WP</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Plant Parasitic Nematodes; enhanced root development</li> </ul>	
<b>Trichotech® WP</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Soilborne fungal diseases (Armillaria, Botrytis, Crown Gall, Fusarium, Pythium, Rhizoctonia, Root Rots, Sclerotinia, Stem Cankers)</li> </ul>	
<b>Amblytech C®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls broad Mite, Cyclamen Mite, Red Spider Mite, Thrips Larvae</li> </ul>	
<b>Amblytech®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Red Spider Mite</li> </ul>	
<b>Diglytech®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Leafminers</li> </ul>	



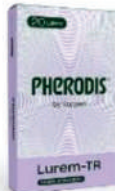




Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Hypotech®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Bulb Mites, Leafminers, Sciarid Flies, Thrips</li> </ul>	
<b>Phytotech®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Red Spider Mite, Two Spotted Mite</li> </ul>	
<b>Nematech S® SP</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Leafminers, Sciarid Flies, Thrips</li> </ul>	
<b>Nematech H®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Leafminers, Sciarid Flies, Thrips</li> </ul>	-
<b>Slugtech® SP</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Slugs, Snails</li> </ul>	-
<b>Helitech</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Helicoverpa armigera</li> </ul>	
<b>NEMguard®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Plant Parasitic Nematodes</li> </ul>	
<b>Delta Trap®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Monitoring and trapping flying insect pests</li> </ul>	
<b>Roller Trap®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Monitoring and trapping flying insect pests</li> </ul>	
<b>Blue STICKTECH®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Thrips</li> </ul>	

Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Yellow STICKTECH®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Controls Aphids, False Coddling Moth, Leafminers, Mealybugs, Sciarid Flies, Whiteflies</li> </ul>	
<b>Duponchelia®</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Duponchelia monitoring</li> </ul>	
<b>Tuta Absoluta® (Pheromone)</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Tuta absoluta monitoring</li> </ul>	-
<b>Planococcus® (Pheromone)</b>	Dudutech info@dudutech.com; +254 704 491120	<ul style="list-style-type: none"> <li>Planococcus (mealybugs) monitoring</li> </ul>	-
<b>Bio catch</b>	Osho Chemicals (+254)0711 045 000 (+254)0732 167 000 customercare@oshochem.com	<b>TARGET PESTS</b> <ul style="list-style-type: none"> <li>Aphids, Jassids, Whitefly, Leaf hoppers, and Mealy bugs</li> </ul> <b>RATE OF USE</b> <ul style="list-style-type: none"> <li>Liquid: 2-3ltr/ha.</li> <li>Powder: 3-4kg/ha</li> </ul>	
<b>Bio Dewcon</b>	Osho Chemicals (+254)0711 045 000 (+254)0732 167 000 customercare@oshochem.com	<ul style="list-style-type: none"> <li>Controls Powdery Mildew, Downy Mildew</li> </ul>	
<b>Bio Magic</b>	Osho Chemicals Call: (+254)0711 045 000 (+254)0732 167 000 SMS: 20560 WhatsApp: +254 791 720 516 Email: customercare@oshochem.com	<ul style="list-style-type: none"> <li>Controls locust</li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>160ml / 20L of water (4L/ha in 500L of water) at 14days interval.</li> </ul>	
<b>Bio-Nemation</b>	Osho Chemicals (+254)0711 045 000 (+254)0732 167 000 customercare@oshochem.com	<ul style="list-style-type: none"> <li>Bionematicide for control of nematodes</li> </ul>	
<b>Bio Power</b>	Osho Chemicals (+254)0711 045 000 (+254)0732 167 000 customercare@oshochem.com	<ul style="list-style-type: none"> <li>use against Beetles, Weevils, Desert Locust, Termites, Mealy bugs, Scales, Thrips, Aphids, Whiteflies, Caterpillars, Bollworms and Fruit Flies.</li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>80ml / 20L of water</li> <li>(4L/ha)</li> </ul>	
















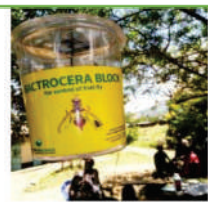



Product trade name	Company and contact details	Use/purpose	Visual/label
<b>BIO-CURE - F</b>	Osho Chemicals (+254)0711 045 000 (+254)0732 167 000 customer@oshchem.com	<ul style="list-style-type: none"> <li>Controls Pythium spp., Rhizoctonia solani Fusarium spp., Botrytis cinerea, Sclerotium rolfsii, and Sclerotinia homoeocarpa causing root rot, root wilt, seedling rot and color-rot diseases in crops such as but not limited to vegetables, cereals, pulses, fruit trees, ornamental crops</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>Liquid: 2-3ltr/ha.</li> <li>Powder: 3-4kg/ha</li> </ul>	
<b>Halt Neo</b>	Osho Chemicals (+254)0711 045 000 (+254)0732 167 000 customer@oshchem.com	<ul style="list-style-type: none"> <li>Control of Fall Armyworm on Maize; Thrips, African Bollworm on French beans; Caterpillars on roses and Diamond back moth on Cabbages.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>Half fill the spray-tank with water, and then mix the required amount of HALT NEO 5% WP with a little water to prepare a uniform suspension. Add this suspension to the spray tank &amp; top-up to the required amount of water.</li> </ul>	
<b>Capsanem Steinernema carpocapsae</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<p>Control of various insect pests.</p> <ul style="list-style-type: none"> <li>Caterpillars (Lepidoptera): Tuta absoluta; European pepper moth; Box tree moth; Cranberry girdler; Noctuidae: armyworms; Cotton bollworm; Corn earworm; Tomato looper; cutworms; Silver-Y moth. Beetle larvae: Colorado potato beetle; Flatheaded root borer. Fly larvae (Diptera): Shore flies; Crane flies/leatherjackets. Bugs: Tomato bug; Sycamore lace bug; Mole crickets: European mole cricket; American mole crickets.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>Nematodes can be applied using a watering can, an airblast sprayer, through a sprinkler system, with a backpack sprayer, or a vehicle-mounted spray unit.</li> <li>Pressure-compensated irrigation systems are recommended. If not available, spray or drench applications are recommended. For injection through Dosatron/Venturi systems, please contact your local representative for specific advice.</li> </ul>	
<b>Chrysopa-E Chrysoperla carnea</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Use for: Aphids Aphids and other pests, like mealybugs, Echinothrips and butterfly and moth eggs.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>10-100 eggs per m2/release.</li> </ul>	

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<b>Citripar Anagyrus vladimiri</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Used for all stages of many mealybug species.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>5-40 per m<sup>2</sup>/release. Releases should be repeated at least 3 times at intervals of 1-2 weeks, or until the pest is controlled</li> </ul>	
<b>Deltatrap Pheromone trap</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Pheromone trap</li> <li>Hang the traps approximately 10 cm above the crop in a location where they can easily be inspected (e.g. along the centre aisle of the greenhouse)</li> </ul>	
<b>Entomite-M Stratiolaelaps scimitus</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Use for: Sciarid flies Thrips</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>100-500 per m<sup>2</sup>/release.</li> </ul>	
<b>Ercal Eretmocerus eremicus</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Control of greenhouse whitefly and tobacco whitefly</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>1-10 per m<sup>2</sup>/release. Repeat at least 3 times weekly until control is achieved.</li> </ul>	
<b>Horiver Disc Sticky trap with dry glue</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For trapping root aphids and fungus gnats</li> <li>Disc for easy placing around plant stem on substrate block or pot</li> <li>With holes for drip irrigation</li> </ul>	
<b>Horiver Drystick Sticky trap with dry glue</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Trapping and monitoring different flying insects. The traps work particularly well for bugs such as Lygus spp. and Nesidiocoris tenuis.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>For monitoring use one Horiver Drystick per 200 m<sup>2</sup></li> <li>For trapping in hotspots use one Horiver Drystick per 2 to 20 m<sup>2</sup></li> </ul>	
<b>Horiver Rollertrap Sticky trap with wet glue</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For trapping whiteflies, thrips, leaf miner and fungus gnats</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>One Rollertrap per 1 to 3 plant rows.</li> </ul>	

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<b>Horiver Wetstick</b> Sticky trap with wet glue	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For trapping and monitoring different flying insects</li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>Attach traps to wires or sticks at max. 30 cm above the crop and adjust height when plants are growing</li> <li>For <i>Tuta absoluta</i> place black traps 15-25 cm above the ground for young plants and 50 cm above the ground for mature plants</li> </ul>	
<b>Limonica</b> <i>Amblydromalus limonicus</i>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Control of thrips and whiteflies</li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>50-250 per m2/release.</li> </ul>	
<b>Lurem-TR Thrips</b> kairomone	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For early detection of thrips</li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>1 dispenser per 100 m<sup>2</sup></li> <li>Replace after 6 weeks</li> </ul>	
<b>Macro-Mite</b> <i>Macrocheles robustulus</i>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Used for control of sciarid fly larvae and thrips pupae</li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>100-500 per m2/release.</li> </ul>	
<b>Miglyphus</b> <i>Diglyphus isaea</i>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For the control of leaf miners</li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>0.25-3 per m2/release. Releases should be repeated at least 3 times at weekly intervals or until control is achieved.</li> </ul>	
<b>Mirical</b> <i>Macrolophus pygmaeus</i>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Generalist predator with a preference for whitefly and also has an effect on <i>Tuta absoluta</i></li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>Introduce in clusters of at least 50 predatory bugs</li> <li>Create 6-10 distribution points per bottle</li> <li>Spread material thinly (maximum 1 cm thick)</li> </ul>	
<b>Nopath Thyme oil,</b> peppermint oil	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Biofungicide</li> <li>Apply 0.1-0.5 litre/100 litre water</li> </ul>	









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<b>Pherodis Luring substance</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Use to attract male moths, beetles, mealybugs and flies to traps.</li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>Two or four dispensers per hectare.</li> </ul>	
<b>Spical Neoseiulus californicus</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Use for: Spider mites</li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>Introduction rates typically range from 25-125 per m2/release.</li> </ul>	
<b>Spical Ulti-Mite Neoseiulus californicus</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Use for: Spider mites</li> </ul> <b>Application</b> <ul style="list-style-type: none"> <li>Use at least 4,000 sachets per ha and hang them evenly spaced in the crop. Release should be repeated after 4-6 weeks if the pest is not controlled</li> </ul>	
<b>Spical-Plus Neoseiulus californicus</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Use for: Spider mites</li> <li>Use at least 4,000 sachets per ha and hang them evenly spaced in the crop. Release should be repeated after 4 weeks if the pest is not controlled.</li> </ul>	
<b>Spidex Phytoseiulus persimilis</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Use for: Spider mites</li> <li>Introduction rates typically range from 2-50 per m2/release. Releases should be repeated once or twice at weekly intervals.</li> </ul>	
<b>Spidex Vital Phytoseiulus persimilis</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For the control of spider mite only</li> <li>Introduction rates typically range from 2-50 per m2/release. Releases should be repeated once or twice at weekly intervals.</li> </ul>	
<b>Swirski Ulti-Mite Amblyseius swirskii</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Use for: Thrips Whiteflies</li> <li>Use at least 4,000 sachets per ha and hang them evenly spaced in the crop. Release should be repeated after 4 weeks if the pest is not controlled.</li> </ul>	
<b>Swirski-Mite Amblyseius swirskii</b>	Koppert Biological Systems (K) Ltd.  +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For the control of thrips and whitefly</li> <li>Introduction rates typically range from 25-300 per m2/release. Releases should be repeated if necessary.</li> </ul>	




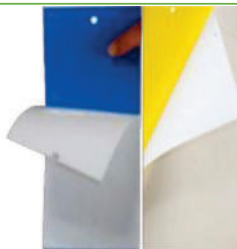
Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Swirski-Mite LD Amblyseius swirskii</b>	Koppert Biological Systems (K) Ltd. +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For the control of thrips and whitefly</li> <li>Use at least 4,000 sachets per ha and hang them evenly spaced in the crop. Release should be repeated after 5-6 weeks if the pest is not controlled.</li> </ul>	
<b>Swirski-Mite Plus Amblyseius swirskii</b>	Koppert Biological Systems (K) Ltd. +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For the control of thrips and whitefly</li> <li>Use at least 4,000 sachets per ha and hang them evenly spaced in the crop. Release should be repeated after 4 weeks if the pest is not controlled.</li> </ul>	
<b>Thripex Neoseiulus cucumeris</b>	Koppert Biological Systems (K) Ltd. +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For the control of thrips</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>4,000 introduction points per hectare, evenly distributed over the total surface</li> </ul>	
<b>Trianum-G Trichoderma harzianum T-22</b>	Koppert Biological Systems (K) Ltd. +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>Prevents and controls soil borne diseases</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>10-50 kg/ha, 1-10 kg/1000 plants or 375-750 gram/m3 of growing substrate</li> </ul>	
<b>Tutasan Tuta absoluta pheromone</b>	Koppert Biological Systems (K) Ltd. +254 731 202191 info@koppert.co.ke	<ul style="list-style-type: none"> <li>For monitoring and trapping male Tuta absoluta</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>Maintain a distance of 15-20 metre between traps</li> </ul>	
<b>Bactrocera Complete Set</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Attract-and-kill bait station for Bactrocera fruit fly species</li> <li>20 pieces per hectare.</li> </ul>	
<b>Blue Sticky Paper</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Used for thrips control</li> </ul>	
<b>Ceratitis-Block</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Attract-and-kill bait station for Ceratitis fruit fly species</li> </ul>	
<b>Crytrack Complete Set</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Pheromone lure and trap for False Codling Moth</li> </ul>	

Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Falltrack</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Monitoring and control of Fall Armyworm using pheromone traps.</li> </ul>	
<b>Femtract</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Pheromone trap for monitoring female moth populations.</li> </ul>	
<b>FitoMaat</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Enhances plant resistance to abiotic stress and improves crop quality.</li> </ul>	
<b>Fruit fly mania</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Attract-and-kill bait station for various fruit fly species.</li> </ul>	
<b>Gemtrack</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Pheromone trap for monitoring Geminivirus vectors.</li> </ul>	
<b>Meltrack Complete Set</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Pheromone trap for monitoring Melon Fly populations.</li> </ul>	
<b>Tutrack Sticky Cards®</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Sticky cards used in conjunction with Tutrack traps for monitoring <i>Tuta absoluta</i>.</li> </ul>	
<b>Yellow sticky paper</b>	Kenya Biologics Ltd. kb@agroduka.com +254 710 724 629	<ul style="list-style-type: none"> <li>Used for monitoring and controlling whiteflies and aphids.</li> </ul>	
<b>Trichoguard WP</b>	Agrifarm Biologicals Limited Tel: 020-2418600, Mobile: +254-771-206901/2, +254-722-206902 Email: Info@Thikawaxworks.Com	<ul style="list-style-type: none"> <li>A biological product for control of soil pathogenic fungi and a Bio fertilizer that enhances crop development.</li> </ul>	-
<b>Biokil WP</b>	Agrifarm Biologicals Limited Tel: 020-2418600, Mobile: +254-771-206901/2, +254-722-206902 Email: Info@Thikawaxworks.Com	<ul style="list-style-type: none"> <li>Controls Caterpillars in French beans, Giant Looper in Coffee, Caterpillars and False codling moth in Roses, Diamond Back Moth in broccoli and Fall Army Worm in Baby Corn.</li> <li><b>Rate:</b> 20g in 20ltr</li> </ul>	-






Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Bio-Mat 13SL</b>	Agrifarm Biologicals Limited Tel: 020-2418600, Mobile: +254-771-206901/2, +254-722-206902 Email: Info@Thikawaxworks.Com	<ul style="list-style-type: none"> <li>Control of spider mites, whiteflies, thrips and mealybugs in roses; aphids &amp; whiteflies</li> <li>on French beans, Aphids, Spidermites &amp; Tuta absoluta on tomatoes.</li> <li><b>Rate:</b> 1ml in 1Ltr</li> </ul>	-
<b>Pyretone 40EC</b>	Agrifarm Biologicals Limited Tel: 020-2418600, Mobile: +254-771-206901/2, +254-722-206902 Email: Info@Thikawaxworks.Com	<ul style="list-style-type: none"> <li>Use for control of thrips, aphids and whiteflies Application</li> <li>20ml in 20 lts</li> <li>1L in 100lts per Ha</li> </ul>	-
<b>Stop gel</b>	Rue organics info@organicandallaied.net	<ul style="list-style-type: none"> <li>Stopgel is a fast acting and long lasting biopesticide for the control (lepidopteran) pests in wide range of vegetables. its mode of action on pest is suffocation and dehydration hence it lea</li> </ul>	
<b>Rue-sil</b>	Rue organics info@organicandallaied.net	<ul style="list-style-type: none"> <li>Rue-sil has a gel formulation that coats an insect's skin and blocks oxygen exchange in the body thereby suffocating it to death. This product is more effective in soft bodied pests like all caterpillar family species and other sucking pests such as whiteflies and the like.</li> </ul>	
<b>Trianum</b>	Amiran Kenya Ltd. pr@amirankenya.com +254 20 697 8000	<ul style="list-style-type: none"> <li>Biological fungicide for control of soil-borne diseases like Fusarium, Pythium, and Rhizoctonia in various crops.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>1-5 kg/ha or 15-30 gram/1000 plants</li> </ul>	-
<b>Funguran-OH</b>	Amiran Kenya Ltd. pr@amirankenya.com +254 20 697 8000	<ul style="list-style-type: none"> <li>Copper-based fungicide effective against downy mildew, bacterial blight, and other fungal diseases.</li> </ul>	-
<b>Pacylos 18 WP</b>	Amiran Kenya Ltd. pr@amirankenya.com +254 20 697 8000	<ul style="list-style-type: none"> <li>Bio-insecticide for control of whiteflies, thrips, and aphids</li> </ul>	
<b>KOBE 1.2 SL</b>	Amiran Kenya Ltd. pr@amirankenya.com +254 20 697 8000	<ul style="list-style-type: none"> <li>Bio fungicide activates plant immunity against powdery mildew</li> </ul>	-
<b>Tarsus</b>	Amiran Kenya Ltd. pr@amirankenya.com +254 20 697 8000	<ul style="list-style-type: none"> <li>Immune booster against insects</li> </ul>	-
<b>Flower DS 4EC</b>	Kapi limited +254 726 114 140 / +254 737 127 853 info@kapiltd.co.ke / sales@kapiltd.co.ke	<ul style="list-style-type: none"> <li>Control of aphids, whiteflies, thrips, and diamond back moth</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>2ml per liter</li> <li>2litre per hectare</li> </ul>	

Product trade name	Company and contact details	Use/purpose	Visual/label
Flower dust	Kapi limited +254 726 114 140 / +254 737 127 853 info@kapiltd.co.ke / sales@kapiltd.co.ke	<ul style="list-style-type: none"> <li>Control of fall army worm in maize</li> </ul>	
Agripest organic 75EC	Kapi limited +254 726 114 140 / +254 737 127 853 info@kapiltd.co.ke / sales@kapiltd.co.ke	<ul style="list-style-type: none"> <li>Is a contact Biopesticide for the control of <i>Tuta Absoluta</i> on Tomatoes, Aphids and Diamondback moth on Broccoli.</li> </ul>	
BIO-T-PLUS	Sineria Kenya Limited +254 722 354 760 info@sineria.co.ke	<ul style="list-style-type: none"> <li><i>Bacillus thuringiensis var. kurstaki</i> – controls thrips and African bollworm on beans and roses</li> </ul>	-
BIO CATCH 1.5 LF	Sineria Kenya Limited +254 722 354 760 info@sineria.co.ke	<ul style="list-style-type: none"> <li><i>Lecanicillium lecanii</i> – biological insecticide for aphids, whiteflies, thrips on beans &amp; roses</li> </ul>	-
BIOCURE B 1.75 WP	Sineria Kenya Limited +254 722 354 760 info@sineria.co.ke	<ul style="list-style-type: none"> <li><i>Pseudomonas fluorescens</i> – controls Botrytis, Septoria, Sclerotinia in tomatoes</li> </ul>	-
BIOPOWER 1.5 Liquid	Sineria Kenya Limited +254 722 354 760 info@sineria.co.ke	<ul style="list-style-type: none"> <li><i>Beauveria bassiana</i> – controls aphids, bollworms, caterpillars, thrips in multiple crops</li> </ul>	-
PERIL 2.4 SL Soluble Concentrate	Sineria Kenya Limited +254 722 354 760 info@sineria.co.ke	<ul style="list-style-type: none"> <li>Insecticide/miticide for the control of aphids and spidermites on Roses and Tomatoes, aphids and whiteflies on French beans, thrips in chives</li> </ul>	-
BIOFIGHT 50ME Micro Emulsion	Greenlife Crop Protection Africa Ltd +254 722 563 698, +254 735 544 544 +254 723 443 677	<ul style="list-style-type: none"> <li>Fungicide for control of soft rot in broccoli, Powdery mildew &amp; Anthracnose in water melon, Early light, Late blight and anthracnose, in tomatoes, angular leaf spot, anthracnose and rust in French beans, Angular leaf spot, and Downy mildew on cucumber, Downy mildew, purple blotch and rust in onions.</li> </ul>	-
BIOGRADE 300 SL Soluble	Greenlife Crop Protection Africa Ltd +254 722 563 698, +254 735 544 544 +254 723 443 677	<ul style="list-style-type: none"> <li>Insecticide for control of Diamondback moth in cabbage and snails in paddy fields</li> </ul>	-
BIOSUPER 10 EW Emulsion oil in Water	Greenlife Crop Protection Africa Ltd +254 722 563 698, +254 735 544 544 +254 723 443 677	<ul style="list-style-type: none"> <li>Control of Diamond Back moths on Cabbages; whiteflies on basil; thrips on chives and onions; whiteflies and thrips on snow peas; aphids and melon fly on cucumber and watermelon; whiteflies, thrips and leaf miners on French beans, aphids and whiteflies on tomatoes, aphids and diamondback moth on broccoli, thrips and aphids on chillies.</li> </ul>	-



Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Biomysis Mean 1.15% WP</b>	Bio Organic Ltd. info@bioorganic.co.ke +254 792 458 379	<ul style="list-style-type: none"> <li>Biological insecticide targeting a range of pests in various crops.</li> <li>Application Rate (1000L/Ha)</li> </ul>	
<b>Biobat 0.5% WP</b>	Bio Organic Ltd. info@bioorganic.co.ke +254 792 458 379	<ul style="list-style-type: none"> <li>Bio-insecticide effective against specific insect pests.</li> <li>Application rate</li> <li>1kg per hectare</li> </ul>	
<b>Biorise GR</b>	Bio Organic Ltd. info@bioorganic.co.ke +254 792 458 379	<ul style="list-style-type: none"> <li>Granular bio-fertilizer enhancing root development and nutrient uptake.</li> <li>Application Rate (100L/H)</li> </ul>	
<b>Biovert 1.15% WP</b>	Bio Organic Ltd. info@bioorganic.co.ke +254 792 458 379	<ul style="list-style-type: none"> <li>Biological fungicide for controlling fungal diseases in crops.</li> <li>Application Rate (1000L/Ha) 2 – 3kgs</li> </ul>	-
<b>Catch Master Cards</b>	Bio Organic Ltd. info@bioorganic.co.ke +254 792 458 379	<ul style="list-style-type: none"> <li>Sticky traps (blue and yellow) for monitoring and controlling flying insect pests.</li> </ul>	
<b>Achook</b>	Organix Limited eco@organix agro.com +254 720 937 535 / +254 735 712 090	<ul style="list-style-type: none"> <li>Neem-based biopesticide for control of nematodes, whiteflies, thrips; bee-safe and organic.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>1 Litre per hectare or 20ml into 20 Litres of water.</li> </ul>	-
<b>Flipper</b>	Bayer East Africa agriculture.ke@bayer.com +254 709 749 000	<ul style="list-style-type: none"> <li>Naturally derived insecticide targeting leaf-mining thrips (e.g., <i>Frankliniella occidentalis</i>) and whiteflies.</li> </ul>	-
<b>Velum Prime (nematicide)</b>	Bayer East Africa agriculture.ke@bayer.com +254 709 749 000	<ul style="list-style-type: none"> <li>Controls plant-parasitic nematodes in root crops. Not organic-certified but biological.</li> </ul>	-
<b>BioAct Plus (biofungicide)</b>	Bayer East Africa agriculture.ke@bayer.com +254 709 749 000	<ul style="list-style-type: none"> <li>Microbial-based control against early blight and foliar diseases in tomatoes and potatoes.</li> </ul>	-




Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Organic pesticide</b>	Griincom +254 722 861 885 info@griincom.co.ke	<ul style="list-style-type: none"> <li>Control Aphids, Thrips, Armyworms, Whiteflies, Asparagus Beetle, Cabbage looper, Cornworm, Cutworms and many more.</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>100ml for 20ltrs of water.</li> </ul>	
<b>Data trap (sticky trap)</b>	Bharat Bio East Africa Limited +254 113423461   0708 800 868 info@bbeal.com	<ul style="list-style-type: none"> <li>Controls whitefly, leaf miner, aphid, trips, fruit fly, moths and other flying insects.</li> </ul>	
<b>Solar insect trap</b>	Bharat Bio East Africa Limited +254 113423461   0708 800 868 info@bbeal.com	<ul style="list-style-type: none"> <li>Traps flying insect</li> </ul>	
<b>PHYTOGARD</b>	Andermatt Kenya Ltd, Kenya +254 020 2100 880 info@ander matt.co.ke	<ul style="list-style-type: none"> <li>Predatory mite for the control and management of Two-spotted mites roses</li> </ul>	-
<b>Eco-Bb WP Beauveria bassiana Strain R444 2.0×10<sup>8</sup> cfu/g</b>	Andermatt Kenya Ltd, Kenya +254 020 2100 880 info@ander matt.co.ke	<ul style="list-style-type: none"> <li>Control of mealybugs, thrips and spider mites in roses; aphids, thrips, whiteflies and red spider mites in French beans, whiteflies, aphids and thrips on basil and False codling moth and Fruit fly on mangoes.</li> </ul>	-


## 1.3 Commercial bio-inputs for livestock

### 1.3.1 Commercial bio-feeds for livestock

Product trade name	Company and contact details	Use/purpose	Visual/label
<b>KuzaPro livestock feed</b>	Sanergy LTD, Nairobi info@farmstar.co.ke +254 718 800 330	<ul style="list-style-type: none"> <li>KuzaPro is a high protein insect-based animal feed for fish, pigs, poultry and pets. It's made from dry black soldier fly larvae (BSFL).</li> <li>KuzaPro can be fed to the animals directly or mixed with regular feed. It is packaged in 30kg bags.</li> </ul>	
<b>Croton seed poultry meal</b>	Ecofix Kenya Limited +254 712 684160 info@efk.co.ke	<ul style="list-style-type: none"> <li>Poultry feed from croton seed, a strong, safe source of raw protein for poultry production.</li> </ul>	

Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Anansi insect protein powder</b>	Nutrimzuri Farmcare Ruai, Nairobi, Kenya Email: info@nutrimzuri.co.ke Contact: +254 726 811 123	<ul style="list-style-type: none"> <li>Protein-rich feed supplement made from insect larvae for aquatic and livestock feed.</li> <li>Feed directly to livestock or in feed formulations</li> </ul>	

### 1.3.2 Commercial organic and bio pesticides for livestock

Product trade name	Company and contact details	Use/purpose	Visual/label
<b>Neelex organic dewormer</b>	Organic Kenya Call: +254 725 135 150 info@organickenya.co.ke	Livestock dewormer <ul style="list-style-type: none"> <li>Cattle: Administer 10-20 ml per animal, mixed with feed.</li> <li>Sheep and Goats: Use 5-10 ml per animal.</li> <li>Poultry: Mix 1-2 ml per liter of drinking water.</li> </ul>	







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# Benefits of Foliar

- Directly feeds plants through leaves
- Faster nutrient uptake than soil feeding
- Targets specific nutrient gaps
- Promotes healthier, stronger plants
- Increases crop quality and quantity



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 Contact Us: 0758 544 813 || Email Us: [info@griincom.co.ke](mailto:info@griincom.co.ke)  
 We are located Along Nakuru-Nairobi Highway 104, Greensteds, Nakuru.



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Promoting Innovation and Technology in Agriculture and Food

**GRIINCOM PRODUCTS**

- COMPOSTER
- FOLIAR
- ORGANIC FERTILIZER
- BIO PESTICIDE






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# 2


## FARMER INNOVATIONS AND PRACTICES




### 2.1 Farmer soil health and plant nutrition innovations and practices

Product	Purpose	Procedure for preparation/key materials	How to apply	Product picture
<b>Bokashi manure</b>	Soil amender	<ul style="list-style-type: none"> <li>Pour the sawdust, soil, manure, wheat bran, charcoal dust and ash into a Container or a shaded area on the ground.</li> <li>Water the layers with a solution of water, molasses and yeast.</li> <li>Repeat this process until all materials are used.</li> <li>Thoroughly mix the materials and continue to water.</li> <li>Turn the mixture twice a day for three days, after which turn it once a day for ten days.</li> <li>The bokashi manure will be ready for use after 15 days and should not be Kept for more than 30 days.</li> </ul>	<ul style="list-style-type: none"> <li>There are various ways of applying bokashi on the farm depending on the plants and the fertility of the soil.</li> <li>When planting maize, for instance, one can dig a hole, add bokashi and then add soil on top of the bokashi before adding the seeds.</li> </ul>	
<b>Compost manure</b>	Use as a planting manure	<ul style="list-style-type: none"> <li>Start with a layer of organic matter. This can be leaves, grass clippings, or other organic waste.</li> <li>Add a layer of dirt or soil over the organic matter. This will help the compost process.</li> <li>Moisten the layers with water.</li> <li>Cover the compost pile with a tarp or black plastic to help it retain heat.</li> <li>Turn the pile every few days to help aerate it.</li> </ul>	<ul style="list-style-type: none"> <li>After about two weeks, the compost should be ready to use. Spread it around your garden and plant your seeds or seedlings</li> </ul>	
<b>Vermicompost manure</b>	Use as planting manure	<ul style="list-style-type: none"> <li>Red wigglers earthworms are used to decompose and convert organic waste like fruits and vegetables, bread, eggshells etc. into nutrient rich manure</li> </ul>	<ul style="list-style-type: none"> <li>Vermicompost (dark in colour, odorless smell) can be used as a planting manure.</li> </ul>	
<b>Black Soldier Fly (BSF) frass fertilizer</b>	Use as planting manure	<ul style="list-style-type: none"> <li>It involves breeding and raising black soldier fly to convert organic waste into high quality protein, and valuable nutrient organic biomass.</li> </ul>	<ul style="list-style-type: none"> <li>The valuable nutrient organic biomass can be used as a planting manure</li> </ul>	






Product	Purpose	Procedure for preparation/key materials	How to apply	Product picture
<b>Farm Yard Manure</b>	Use as planting manure	<ul style="list-style-type: none"> <li>Is made from decomposed animal waste, bedding materials, and leftover feed. From cattle, poultry, goats, sheep and other farm livestock.</li> <li>Lay alternately layers of dung and urine-soaked beddings, straw, crops residues or any dry organic matter.</li> <li>Leave the heap for 2 to 3 months to decompose.</li> <li>The manure becomes dark, crumbly and odorless.</li> </ul>	<ul style="list-style-type: none"> <li>The manure becomes dark, crumbly and odorless is used for planting.</li> </ul>	
<b>Liquid Manure</b>	Used as foliar manure	<ul style="list-style-type: none"> <li>Pour water into the bucket or drum.</li> <li>Add a well cured cow dung manure and ash into a sack and tie the sack tightly with a string.</li> <li>Tie the sack onto the wood and submerge it into the bucket or drum.</li> <li>Leave it for 14 days before it is ready for use.</li> <li>A farmer can use any well cured farmyard manure to make a liquid manure foliar.</li> </ul>	<ul style="list-style-type: none"> <li>Apply half or 1 litre of liquid manure around the stem of each vegetable crop.</li> </ul>	
<b>Rabbit Urine</b>	Foliar fertilizer	<ul style="list-style-type: none"> <li>Rabbit urine diluted with water at the ratio of 1 part of urine to 5 parts of water.</li> <li>Some farmers add molasses.</li> </ul>	<ul style="list-style-type: none"> <li>Spray on the leaves every 2 weeks until crop flowering stage</li> </ul>	
<b>Vermi-urine</b>	Foliar fertilizer	<ul style="list-style-type: none"> <li>Red wigglers earthworms are used to decompose and convert organic waste like fruits and vegetables, bread, eggshells etc. into nutrient rich manure</li> </ul>	<ul style="list-style-type: none"> <li>Apply half or 1 litre of liquid manure around the stem of each vegetable crop.</li> </ul>	





## 2.2 Farmer innovations and practices for crop pest and disease management and control

Product	Purpose	Procedure for preparation/key materials	How to apply	Target pest	Image
<b>Neem/ Mwarubaine</b>	Biopesticide	<ul style="list-style-type: none"> <li>Crush 2kg of neem leaves, place them in a container, add water, and leave the mixture to ferment for 7-14 days.</li> </ul>	<ul style="list-style-type: none"> <li>Sieve the mixture to obtain the liquid concentration.</li> <li>Dilute with water in a ratio of 1 to 5.</li> <li>Spray on the leaves in the early morning or late evening to control armyworms, aphids.</li> </ul>	<ul style="list-style-type: none"> <li>Aphids, leafhoppers, whiteflies, scale insects</li> </ul>	

Product	Purpose	Procedure for preparation/key materials	How to apply	Target pest	Image
<b>Ashbrew</b>	Insecticide	<ul style="list-style-type: none"> <li>Boil water, cut bar soap into pieces, add the bar soap to the boiled water and stir for 35 minutes, when stirring add cold water to reduce bubble, let it cool and spray weekly</li> </ul>	<ul style="list-style-type: none"> <li>Spray on crops weekly</li> </ul>	<ul style="list-style-type: none"> <li>Soft bodied insects like cutworms, snails; bacterial, fungal and viral diseases</li> </ul>	
<b>Tithonia diversifolia</b>	Biopesticide	<ul style="list-style-type: none"> <li>Crush 2kg of tithonia leaves, place them in a container, add water, and leave the mixture to ferment for 7-14days.</li> </ul>	<ul style="list-style-type: none"> <li>Sieve the mixture to obtain the liquid concentration.</li> <li>Dilute with water in a ratio of 1 to 5.</li> <li>Spray on the leaves in the early morning or late evening to control armyworms, aphids.</li> </ul>	<ul style="list-style-type: none"> <li>Aphids, armyworms, caterpillars</li> </ul>	
<b>Garlic and Chillies</b>	Biopesticide	<ul style="list-style-type: none"> <li>Crush a handful of garlic, Mix with one teaspoonful of powdered chili / pepper</li> <li>Place them in a container,</li> <li>Add water, and leave the mixture to ferment for 7-14days.</li> </ul>	<ul style="list-style-type: none"> <li>Sieve the mixture to obtain the liquid concentration. Dilute with water in a ratio of 1 to 5.</li> <li>Spray on the leaves in the early morning or late evening to control armyworms.</li> <li>Spray for caterpillars on fruit trees.</li> <li>If garlic concentrated liquid is drenched in to the soil it kills nematodes.</li> </ul>	<ul style="list-style-type: none"> <li>armyworms, nematodes, caterpillars</li> </ul>	
<b>Chillies and hot pepper solution.</b>	Biopesticide	<ul style="list-style-type: none"> <li>Chop 100g of fruits and put it in a litre of water.</li> <li>Allow it to stand in water for 2-3 days or boil it for 20 minutes.</li> <li>Add an equal amount of water containing soap to dilute.</li> </ul>	<ul style="list-style-type: none"> <li>Spray against all insects</li> </ul>	<ul style="list-style-type: none"> <li>Thrips, aphids, whiteflies, and armyworms among other insect pests.</li> </ul>	



Product	Purpose	Procedure for preparation/key materials	How to apply	Target pest	Image
Chilies, Garlic, Mexican Marigold and Onions	Biopesticide	<ul style="list-style-type: none"> <li>Take three large cloves of garlic, add two handfuls of marigold leaves, two large onions, 2 large peppers.</li> <li>Add water and boil it for 30 min and let it cool.</li> <li>Dilute with 4 times the quantity of water and stir occasionally.</li> <li>Mexican marigolds can be integrated into the farm to manage pests directly.</li> </ul>	<ul style="list-style-type: none"> <li>Spray against all insect pests.</li> </ul>	<ul style="list-style-type: none"> <li>Thrips, aphids, whiteflies among other insect pests.</li> </ul>	
Mexican Marigold	Biopesticide	<ul style="list-style-type: none"> <li>Harvest a lot of Mexican marigold especially when it is flowering.</li> <li>Place it in a drum, half a drum or a debe and cover it with water.</li> <li>Let it stand in the water for 5-10 days and stir occasionally.</li> <li>Cover the stuff with polythene paper.</li> <li>Sieve/ strain the solution.</li> <li>Dilute with soapy water and spray to the affected crops.</li> </ul>		<ul style="list-style-type: none"> <li>It controls aphids, ants, caterpillars, maggots, mosquitoes, termites and nematodes.</li> <li>It also helps in controlling such diseases as blight, mildew, coffee berry disease.</li> </ul>	
Cassava (Muhogo)	Biopesticide	<ul style="list-style-type: none"> <li>-Remove the juicy part by crushing the roots</li> <li>- Dilute in the ratio of 1:1 (cassava juice and water)</li> </ul>	<ul style="list-style-type: none"> <li>Wait for 20days before planting</li> <li>Cassava peels incorporated in the soil prevents nematodes</li> <li>Spray on the soil</li> </ul>	<ul style="list-style-type: none"> <li>Nematodes, Aphids</li> </ul>	
Lantana Camara (Mwingajini)	Biopesticide	<ul style="list-style-type: none"> <li>Ground/crush a handful of leaves</li> <li>Add them in 1 liter water</li> <li>Add little soap</li> </ul>	<ul style="list-style-type: none"> <li>Spray the crops</li> </ul>	<ul style="list-style-type: none"> <li>Most pests</li> </ul>	
Stinging Nettle (Thabai)	Biopesticide	<ul style="list-style-type: none"> <li>Boil 2 kg of stinging nettle in 5 litres water</li> <li>Sieve and spray onto plants</li> </ul>	<ul style="list-style-type: none"> <li>Spray the crops</li> </ul>	<ul style="list-style-type: none"> <li>Fungal diseases (mildew)</li> </ul>	
Pawpaw (Papaya) Carica Papaya	Biopesticide	<ul style="list-style-type: none"> <li>Slice the leaves (1 kg)</li> <li>Put them in 1 liter water</li> <li>Shake vigorously and add 4 litres of water with a little soap.</li> </ul>	<ul style="list-style-type: none"> <li>Spray onto the plant or soil to prevent cutworms</li> <li>Spray on to the soil</li> </ul>	<ul style="list-style-type: none"> <li>Fungi, Nematodes, coffee rust, powdery mildew, rice brown leaf spot</li> <li>Most pests (cutworms)</li> </ul>	

Product	Purpose	Procedure for preparation/key materials	How to apply	Target pest	Image
Sweet Potato (Kiazi Kitamu)	Biopesticide	<ul style="list-style-type: none"> <li>crush the leaves</li> <li>dissolve them in water</li> </ul>	<ul style="list-style-type: none"> <li>spray the plants</li> <li>strong odour from water used in cooking sweet potatoes controls aphids.</li> </ul>	<ul style="list-style-type: none"> <li>Rice brown leaf spot</li> <li>Rice blast other fungi, Aphids</li> </ul>	
Tea (Majani Chai)	Biopesticide	<ul style="list-style-type: none"> <li>dissolve crushed leaves in water and spray.</li> <li>Fruits dissolved in water controls ants.</li> </ul>	<ul style="list-style-type: none"> <li>used tea leaves can be scattered near the crops to control slugs</li> </ul>	<ul style="list-style-type: none"> <li>Fungal diseases, Woolly aphids, squash bugs, slugs, snails, ants</li> </ul>	-
Tomato leaves	Biopesticide	<ul style="list-style-type: none"> <li>Boil 1 kg of chopped leaves in water and spray your crops.</li> <li>Slice 2 handfuls of leaves or tomato fruits into 2 litres water</li> <li>Leave for 5 hrs after which you sieve.</li> <li>Add a little soap.</li> </ul>	<ul style="list-style-type: none"> <li>Spray after every two days</li> <li>NB: Use fresh leaves for immediate spray on cabbage worms.</li> <li>Growing tomato crops prevent cockroaches, asparagus beetle from the houses and fields respectively.</li> </ul>	<ul style="list-style-type: none"> <li>Aphids, ants, diamond black moth, cockroaches, mites, nematodes, whitefly,</li> <li>Bacterial and fungal diseases</li> </ul>	-
Castor Oil (Mbariki)	Biopesticide	<ul style="list-style-type: none"> <li>Dissolve green seeds and leaves in water for 24 hours</li> <li>sieve and spray the crops</li> <li>Dry the green seeds and leaves and grind them into powder</li> <li>put 4 cups of the powder in 2 litres of water</li> <li>Boil for 10 minutes</li> <li>Add little soap and dilute with almost 10 litres water</li> </ul>	<ul style="list-style-type: none"> <li>Spray the soil to prevent cutworms</li> <li>Incorporate seeds and leaves into the soil to prevent fungal diseases causing organisms (fungi)</li> <li>Leaves used for mulching prevents ants</li> </ul>	<ul style="list-style-type: none"> <li>Rats, moles ants, cutworms, Fungal diseases</li> </ul>	
Banana peelings	Biological solution	<ul style="list-style-type: none"> <li>Dry the peelings and burn into ash.</li> </ul>	<ul style="list-style-type: none"> <li>Springle the ash on plant part infested with insects.</li> </ul>	<ul style="list-style-type: none"> <li>Manages insect pests such as aphids.</li> </ul>	
Rosemary	Biological solution	<ul style="list-style-type: none"> <li>Plant among the crops (push-pull)</li> </ul>		<ul style="list-style-type: none"> <li>Repels most insect pests.</li> </ul>	

Product	Purpose	Procedure for preparation/key materials	How to apply	Target pest	Image
<b>Ginger brew</b>	Pest and diseases repellent	<ul style="list-style-type: none"> <li>Crush ginger in water, ferment overnight and use the extract</li> </ul>	<ul style="list-style-type: none"> <li>Spray on plants</li> </ul>	<ul style="list-style-type: none"> <li>Repels most insect pests</li> </ul>	-
<b>Kitchen ash</b>	Biopesticide	<ul style="list-style-type: none"> <li>Used in dust form.</li> </ul>	<ul style="list-style-type: none"> <li>Mix with soil in the planting hole.</li> </ul>	<ul style="list-style-type: none"> <li>Manages Insect pest, fungal diseases, nematodes</li> </ul>	-
<b>Cow dung Ash</b>	Biopesticide	<ul style="list-style-type: none"> <li>Burn dry dung into ash.</li> </ul>	<ul style="list-style-type: none"> <li>Springle the ash on plant part infested with insects or infested with fungal disease.</li> </ul>	<ul style="list-style-type: none"> <li>Manages Insect pest, fungal diseases</li> </ul>	-
<b>Rabbit urine</b>	Biopesticide	<ul style="list-style-type: none"> <li>Dilute in 1part of urine with 4 parts of water.</li> </ul>	<ul style="list-style-type: none"> <li>Spray on affected leaves.</li> </ul>	<ul style="list-style-type: none"> <li>Manages most insect pests and fungal diseases</li> </ul>	-
<b>Lemon grass</b>	Insect pest repellent	<ul style="list-style-type: none"> <li>Plant among crops (push-pull)</li> </ul>		<ul style="list-style-type: none"> <li>Repels most insect pests</li> </ul>	-
<b>Soap solution</b>	Biological control	<ul style="list-style-type: none"> <li>Mix 2 tablespoons of grated soap in 1.5 liters of water.</li> </ul>	<ul style="list-style-type: none"> <li>Spray on infested plant leaves.</li> </ul>	<ul style="list-style-type: none"> <li>Manages most insect pests</li> </ul>	-

#### Sources:

Grow Biointensive Agriculture Center of Kenya (GBIACK), Email: gbiackcentre.org@gmail.com, Phone: 0712469566

COSDEP Kenya, Email: coskenya@yahoo.com, Phone: 0722460769

CSHEP Email: info@cshepkkenya.org, Phone: 0727 977009

Vihiga Nutrition and Community Seed Bank Community Cased Organization, Phone 0720423553.

### 2.2.1 Other pesticidal plants

Scientific name of pesticidal plant	Common names of pesticidal plant	Target Pests	Plant part used	Preparation
<i>Bidens pilosa</i>	(English): Black jack	Aphids	Leaves	Dry, grind and burn. Ash used or mixed in solution to spray on crops
<i>Carica papaya</i>	(English): Pawpaw	Several	Leaves, seeds	Pound leaves, mix with water overnight. Sieve. Spray on crops.
<i>Cordia latifolia</i>	(English): Latifolia	Maize weevil, butterfly	Leaves	Dry plant leaves placed on grains
<i>Desmodium spp</i>	(English): tick-trefoil, tick clover, hitch hikers or beggar lice., (Kikuyu): Desmodia	Stalk borer	Whole plant	Intercropping
<i>Lantana camara</i>	(English): Sleeper weed, lantana, wild sage	Weevil, tuber moth	Leaves	Dry plant leaves placed on grains
<i>Melia volkensii</i>	(English): Melia, (Somali): baba, boba, (Kamba, Embu): Mukau, (Boran): Bamba, (Taita): Mukowe	Termites	Fruit pulp	Mixed with water
<i>Mondia whitei</i>	(English): White's ginger, tonic root, mundondo, mudondo, (Malawi:) Gondolosi, (Luyha): Mkombela	Cut worms	Leaves	Warm water concoction used



Scientific name of pesticidal plant	Common names of pesticidal plant	Target Pests	Plant part used	Preparation
<i>Tanacetum cinerariifolium</i>	(English): Pyrethrum	Many pests	Flowers, seeds	Dry flowers and seeds and grind to a powder. Mix with water
<i>Senna didymobotrya</i>	(English): Popcorn Senna, (Kikuyu): Mwino, (Kamba): Inyumganai, (Kipsigis): Senetwet	Nematodes	Leaves	Crushed and soaked in water
<i>Symplytum spp.</i>	Consoude	Aphids	Leaves, roots	Grind leaves, mix with water and spray. Whole plant intercropped with crops.
<i>Teclea nobilis</i>	(English): small fruited Teclea, (Amharic): atesa, (Luganda): mubio, (Shona): Mumbanziti, Ruwanziri, (Kikuyu): Munderendu, (Meru): Muteratu	Vegetable and fruit insects	Leaves	Leaves mixed with ash and water

**Source:** Anjarwalla P, Belmain S, Sola P, Jamnadass R, Stevenson PC. 2016. Handbook on Pesticidal Plants. World Agroforestry Centre (ICRAF), Nairobi, Kenya.

## 2.3 Traditional practices for control of postharvest (storage) pests

Species	Parts used	Preparation	Uses	Target organisms
<i>Bitter aloe (Aloe ferox)</i>	Live plant Leaves	Dried and ground to powder Leaf ash	<ul style="list-style-type: none"> <li>Repelling action</li> <li>Dusted on stored maize and cowpea at a concentration of 5%w/w</li> </ul>	<ul style="list-style-type: none"> <li>Against broad range of insects</li> <li>Against broad range of insects</li> <li>Against weevils and beetles</li> </ul>
<i>Neem (Azadirachta indica)</i>	Seed	Extract the oil or grind the harvested seed to a powder. Dilute the oil/ powder in soapy water for spraying on crops	Strong anti-feedant, repellent and affects insect growth, causing deformities	Very good for caterpillars, but generally effective against a broad range of insects
<i>Euphorbia (Euphorbia Tirucalli)</i>	Plant's latex	Extraction of latex, dry and grind to powder. Note highly irritant and gloves and masks must be worn when processing	Surface application	Against aphids, some bacteria and molluscs
<i>Wild Sage (Lippia javanica)</i>	Leaves	Dry and grind  Essential oil Often layered whole plants in storage, occasional stirring to release volatile compounds	Can be used both pre- and post- harvest	Against broad range of insects
<i>Mukau (Melia volkensii)</i>	Leaves	Dry and grind	Can be used both pre- and post- harvest	Against broad range of insects
<i>Violet tree (Securidaca longepedunculata)</i>	Root bark	Dry and grind	Can be used both pre- and post- harvest	Against broad range of insects

Species	Parts used	Preparation	Uses	Target organisms
<i>Mexican marigold (Tagetes minuta)</i>	<ul style="list-style-type: none"> <li>Whole plant</li> <li>Live roots</li> </ul>	<ul style="list-style-type: none"> <li>Grind dried plants to produce powder.</li> <li>Plant extract.</li> <li>Essential oil.</li> <li>Boil leaves to produce a decoction.</li> <li>Secretions from live roots.</li> </ul>	<ul style="list-style-type: none"> <li>Added to stored beans and maize</li> <li>As a fumigant</li> <li>Application</li> <li>Ingested by livestock</li> </ul>	<ul style="list-style-type: none"> <li>Maize and bean weevils</li> <li>Against aphid Brevicoryne brassicae and red spider mites in vegetables</li> <li>Against ticks</li> <li>Against intestinal parasites in domestic livestock</li> </ul>
Pyrethrum ( <i>Tanacetum cinerariifolium</i> ) and Fish bean ( <i>Tephrosia vogelii</i> )	Flowers Leaves	<ul style="list-style-type: none"> <li>Dry and grind.</li> <li>Chemicals are not easy to extract in water and is often extracted in kerosene.</li> <li>Crude extract by mixing 20 grams of fresh leaves with 100ml water. Soak for two hours away from direct sun, filter and spray.</li> <li>More effective extract made by adding 5ml liquid soap to the above solution.</li> <li>Dried leaves.</li> </ul>	<ul style="list-style-type: none"> <li>Can be used both pre- and post-harvest.</li> <li>Surface application. Use immediately for optimum effectiveness. 24 hours later, effectiveness is reduced to 60-70%.</li> <li>Mixed with stored grains</li> </ul>	<ul style="list-style-type: none"> <li>Against broad range of insects</li> <li>Against ticks and worms in livestock</li> <li>Against larval stages of mosquitoes, soft bodied insects and mites</li> <li>Against bruchids</li> </ul>
<i>Tithonia diversifolia</i>	Leaves	Shade dry leaves, grind to powder, extract in soapy water	Sprayed on vegetable crops	Against plant pathogenic fungi and broad range of insects
Bitter leaf ( <i>Vernonia Amygdalina</i> )	Leaves	Shade dry leaves, grind to powder, extract in soapy water	Sprayed on vegetable crops	Against plant pathogenic fungi and broad range of insects
Velvet-fruited zanha; Swahili - mkalya	Root bark	Dry and grind	Can be used both pre- and post- harvest	Against broad range of insects



**Source:** Anjarwalla P, Belmain S, Sola P, Jamnadass R, Stevenson PC. 2016. Handbook on Pesticidal Plants. World Agroforestry Centre (ICRAF), Nairobi, Kenya.







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## 2.4 Farmer traditional innovations and practices for management of parasites and diseases in livestock

### 2.4.1 Traditional innovations for treatment of ectoparasites (external parasites)

Parasite name	Image	Signs	Control/treatment
Ticks		<ul style="list-style-type: none"> <li>• Ticks are found on the animal's skin, especially inside the ears, at the base of the tail and neck, and between the legs.</li> <li>• Irritation, scratching and discomfort, weight loss, low milk production.</li> <li>• Tick bites often become infected and turn into abscesses (see 2.2.9.2).</li> <li>• Anaemia, with pale mucous membranes, especially the gums and under the tongue.</li> <li>• Watery eyes when ticks are attached there.</li> <li>• Sagging ears when many ticks attack an animal.</li> <li>• Some ticks lead to paralysis.</li> </ul>	<ul style="list-style-type: none"> <li>• Crush 1 handful of <i>Aloe secundiflora</i> leaves, mix with 1 l of water and rub or brush onto the parts of the animal's body where ticks are present. (Treatment for all animals.)</li> <li>• Boil 1 kg of fresh <i>Ajuga remota</i> leaves in 2 l of water. Wash animals with the warm mixture. (Treatment for all animals.)</li> <li>• Make a paste of green <i>Nicotiana tabacum</i> leaves and apply to the parts of the animal's body where ticks are present. (Treatment for all animals.)</li> <li>• Boil 0.25 kg of <i>Nicotiana tabacum</i> leaves in 4 l of water, add 0.25 kg of soap. Wash or spray the affected animal. (Treatment for all animals.)</li> <li>• Boil 1 kg of fresh or dry <i>Nicotiana tabacum</i> leaves in 10 l of water. Allow the liquid to cool and wash the animal's body. (Treatment for camels, cattle, donkeys, goats, horses and sheep.)</li> <li>• Crush 0.5 kg <i>Adenium obesum</i> (any separate part of the plant or the whole plant), mix with 2 l of water and wash the affected animal (Treatment for all animals). CAUTION: <i>Adenium obesum</i> is very poisonous and should be handled with care. Wear plastic bags over the hands or surgical gloves when handling and applying the liquid mixture. Keep out of the reach of children and prevent animals from licking the treated area.</li> <li>• Dissolve 0.2 kg of salt in 2 l of water and rub onto the animal's body. (Treatment for goats and dogs.)</li> <li>• Pound 5 or 6 <i>Aloe secundiflora</i> leaves and mix with 0.3 l of paraffin oil and 2 handfuls of kitchen ash to make a paste. Apply onto the parts of the animal's body with ticks. (Treatment for camels, cattle, donkeys, goats, sheep, horses and dogs.)</li> <li>• Boil 1 kg of <i>Commiphora africana</i> bark in 2 l of water, cool and wash the affected area. (Treatment for goat and sheep)</li> <li>• Mix 1 l of camel urine with a handful of gum resin of <i>Commiphora erythraea</i>. Apply onto the parts of the animal's body with ticks. (Treatment for camels, cattle, donkeys, horses, goats and sheep.)</li> <li>• Take 1 l of water, mix in a handful of gum resin of <i>Commiphora myrrha</i>, heat and stir until the gum dissolves. Apply warm to tick wounds. (Treatment for camels, goats, sheep, cattle and horses.)</li> <li>• Rub old engine oil on affected areas. (Treatment for goats, cattle and sheep.)</li> </ul>
Mosquito		<ul style="list-style-type: none"> <li>• Painful and itchy bites.</li> <li>• Animals become disturbed during grazing.</li> </ul>	<ul style="list-style-type: none"> <li>• Take the whole dry plant of <i>Ocimum kilimandscharicum</i> and burn it in and around animal pens. (Mosquito repellent.)</li> <li>• Mix 0.5 kg of <i>Tagetes minuta</i> (the whole plant) with 2 kg of cow dung. Dry it in the sun and then burn in and around animal pens. (Mosquito repellent.)</li> <li>• Burn dry <i>Eucalyptus citriodora</i> leaves in animal houses. (Mosquito repellent.)</li> <li>• Burn the gum of <i>Commiphora erythraea</i> close to animals. (Mosquito repellent.)</li> <li>• Take 1 to 2 kg of fresh seed of <i>Azadirachta indica</i>, remove the outer coat of seed and pound until the crushed kernels become brown and sticky. Add 0.25 l of water to make a paste. Squeeze the paste to extract the oil. Rub the oil on the animal's skin. (Mosquito repellent.)</li> </ul>








Parasite name	Image	Signs	Control/treatment
Mites		<ul style="list-style-type: none"> <li>Severe scratching. Affected animals scratch against trees, walls and other objects.</li> <li>Inflamed swelling and thickening of the skin.</li> <li>Skin infections result in discoloured, loose or matted hair and loss of hair/wool/feathers.</li> <li>Loss of appetite causing weakness.</li> <li>Drops in milk and meat production; reduced egg production in chickens.</li> <li>Scaly legs on poultry.</li> <li>The presence of tiny red mites on the feathers of chicken.</li> <li>The death of young poultry.</li> </ul>	<ul style="list-style-type: none"> <li>Crush 20 leaves of <i>Aloe secundiflora</i>, mix with 1 l of water, and brush on to infested parts of the animal's body. (Treatment for sheep, goats, camels and cattle.)</li> <li>Mix 1 l of camel urine with a handful of gum resin of <i>Commiphora erythraea</i>. Heat and stir to make a paste. Apply on affected skin. (Treatment for all animals.)</li> <li>Take 0.5 kg of fresh <i>Juniperus procera</i> fruit, crush and add 1l warm water. Wash the animal with this solution. Repeat daily until the animal recovers.</li> <li>Burn the leaves, bark and branches of <i>Salvadora persica</i> to form charcoal. Powder the charcoal and mix with 1 l of ghee to form a paste. Apply onto affected areas. (Treatment for camels, cattle, donkeys, goats and sheep.)</li> <li>Apply used motor oil to the infested area. Note that the use of too much oil may burn the skin. (Treatment for all animals.)</li> </ul> <p><b>CAUTION:</b> To prevent human infection, wear hand protection (plastic bags over the hands or surgical gloves) when applying treatments. Wash hands thoroughly with soap and water afterwards.</p>
Tsetse flies		<ul style="list-style-type: none"> <li>The bites of tsetse flies are painful and irritate animals.</li> <li>Animals are disturbed during grazing.</li> <li>Bites results in local swelling (chancre).</li> <li>Bites can cause decreased milk production and reduced weight.</li> </ul>	<ul style="list-style-type: none"> <li>Graze animals away from bushes during and after wet periods.</li> <li>In fly-infested areas, move animals during the day.</li> <li>Water animals in the hot midday when flies are less active.</li> <li>Use fly traps.</li> <li>Burn dry cow dung near animals. (Fly repellent.)</li> <li>Take 1 to 2 kg of fresh seed of <i>Azadirachta indica</i>, remove the outer coat of seed and pound until the crushed kernels become brown and sticky. Add 0.25 l of water to make a paste. Squeeze the paste to extract the oil. Rub the oil on the animal's skin. (Fly repellent.)</li> <li>Take about 1 kg of fresh <i>Sesbania sesban</i> leaves, pound, add a little water and rub onto the animal's body. (Fly repellent.)</li> </ul>
Nasal bot (fly larvae)		<ul style="list-style-type: none"> <li>White discharge from the nose.</li> <li>Rubbing of the nose on surfaces.</li> <li>Refusal to eat.</li> <li>Frequent shaking of the head and frequent sneezing.</li> <li>The agitated animal moves in circles.</li> </ul>	<ul style="list-style-type: none"> <li>Crush fresh <i>Solanum incanum</i> roots in a little water and pour a little of this solution into each of the animal's nostrils using a syringe and tube or similar. (Treatment for camels.)</li> <li>Take a yellow, ripe fruit of <i>Solanum incanum</i>, press it to mash the flesh but without puncturing the skin of the fruit. Lift the animal's head, puncture a small hole in the fruit and squeeze the juice into the nostril. The animal will start sneezing and the larvae will be ejected. (Treatment for sheep, goats and cattle.)</li> <li>Crush fresh <i>Acacia brevispica</i> roots and mix with a little water. Pour a little of the liquid into each nostril. (Treatment for camels, sheep and cattle.)</li> </ul>
Biting flies		<ul style="list-style-type: none"> <li>Animals are restless, disturbed during grazing.</li> <li>Itchy bites, small wounds, bleeding, skin inflammation, loss of hair and hide damage.</li> <li>Decreased milk production and reduced weight gain.</li> </ul>	<ul style="list-style-type: none"> <li>Take 1 to 2 kg of fresh seed of <i>Azadirachta indica</i>, remove the outer coat and pound until the crushed kernels become brown and sticky. Add 0.25 l of water to make a paste. Squeeze the paste to extract the oil. Rub the oil on the animal's skin. (Treatment for cows, goats, sheep, donkeys, camels.)</li> <li>Crush 0.5 kg of <i>Adenium obesum</i> tuber or stem bark and mix with 1 l of water. Apply to the animal's body. <b>CAUTION:</b> <i>Adenium obesum</i> is very poisonous and should be handled with care. Wear plastic bags over the hands or surgical gloves when handling and applying the liquid mixture. Keep out of the reach of children and prevent animals from licking the treated area.</li> </ul>

Parasite name	Image	Signs	Control/treatment
Babesiosis (redwater fever)		<ul style="list-style-type: none"> <li>Animals scratch, bite or lick the tick-infested area.</li> <li>Animals have very high fever with red urine.</li> <li>Animals are weak, nervous and tired and do not move about or eat much.</li> <li>The mucous membrane is yellow or pale in colour.</li> <li>Distressed and fast breathing, fast heart rate.</li> <li>Some animals die 2 to 4 days after symptoms appear, if no treatment is given.</li> <li>In infected dead animals the meat is yellow and the blood is thin and watery. The liver and lymph nodes are larger than normal.</li> </ul>	<ul style="list-style-type: none"> <li>Boil 0.5 kg of fresh stem bark of <i>Warburgia ugandensis</i> in 1 l of water. Cool and drench the animal with 0.3 l (cattle dosage, reduce for smaller animals) of the liquid per day for 2 to 3 days. (Treatment for cattle, goats and sheep.)</li> <li>Add 2 full tablespoons of dry, powdered <i>Prunus africana</i> bark to 1 l of water. Leave for 2 hours, stir and drench the infected animal with the infusion once a day for 2 days. (Treatment for cattle.)</li> <li>Take 0.5 kg of fresh bark of <i>Acacia oerfota</i> or <i>Acacia dolichocephala</i>. Soak in 1.5 l of water for 12 hours. Drench the sick animal using 1 l of the liquid for cattle, 0.5 l for goats and sheep. Repeat the next day if the animal has not recovered. (Treatment for cattle, goats and sheep.)</li> </ul>
Fleas		<ul style="list-style-type: none"> <li>Animal will scratch, rub and bite affected areas and roll on the ground.</li> <li>Weakness.</li> <li>Swelling at the site of bites.</li> <li>Fleas can look like black spots on the faces of birds.</li> </ul>	<ul style="list-style-type: none"> <li>Take 1 to 2 kg of <i>Azadirachta indica</i> seed, pound and then cook until brown and sticky. Add 0.25 l of water to make a paste. Squeeze the paste to extract the oil. Rub the oil on animals. (Treatment for all animals.)</li> <li>Crush 0.5 kg of <i>Adenium obesum</i> root. Add 5 l of water and let stand for 10 to 12 hours. Morning and evening, wash the animal with this infusion. Repeat as needed until fleas disappear. (Treatment for all animals.) CAUTION: <i>Adenium obesum</i> is very poisonous and should be handled with care.</li> <li>Wear plastic bags over the hands or surgical gloves when handling and applying the liquid mixture. Keep out of the reach of children and prevent animals from licking the treated area.</li> <li>Crush 0.25 kg of <i>Aloe secundiflora</i> leaves. Add 2 to 3 l of water and let stand for 10 to 12 hours. Morning and evening, wash the animal with this infusion. Repeat as needed until fleas disappear. (Treatment for all animals.)</li> </ul>

**Source:** Dharani N, Yenesew A, Aynekulu E, Tui B, Jamnadass R (2015) Traditional ethnoveterinary medicine in East Africa: a manual on the use of medicinal plants. Dawson IK ed. The World Agroforestry Centre (ICRAF), Nairobi, Kenya.

## 2.4.2 Remedies for skin diseases



Parasite name	Image	Signs	Control/treatment
Dermatophilosis (streptothricosis, lumpy wool)		<ul style="list-style-type: none"> <li>Skin lesions, mainly on the shoulders, back and hindquarters, around the ears and between the legs.</li> <li>Papules that leak serum appear and form crusts, which bleed.</li> <li>A seriously-diseased animal is emaciated and weak, with loss of appetite.</li> <li>Loss of hair. In sheep the disease causes large, hard, thickly-matted lumps of wool.</li> </ul>	<ul style="list-style-type: none"> <li>Take a few fruits of <i>Solanum aculeastrum</i>, roast on charcoal and slice the fruit into halves. Tether the infected animal and remove disease crusts. Rub affected skin areas every day for 3 days with halved fruit. (Treatment for cattle, goats and sheep.) CAUTION: Wear hand protection (plastic bags over the hands or surgical gloves) when applying this treatment, and wash hands thoroughly with soap and water afterwards, because <i>Solanum aculeastrum</i> fruit are poisonous.</li> <li>Take 1 kg of <i>Azadirachta indica</i> bark, 1 kg of <i>Khaya anthotheca</i> bark and 0.5 kg of roasted <i>Ricinus communis</i> seed. Grind these together into a powder. Add a handful of crushed limestone (calcium carbonate) and 2 kg of butter. Mix to make a paste. Tether the infected animal and remove disease crusts. Apply the paste to the affected skin areas daily for 3 to 6 days, until the infection disappears. (Treatment for cattle.)</li> <li>New crusts may appear during treatment, but will fall off. New hair should grow on the treated areas in 2 to 3 weeks.</li> </ul>

Parasite name	Image	Signs	Control/treatment
Contagious skin necrosis		<ul style="list-style-type: none"> <li>One or several swellings on the skin that can burst after 5 to 10 days to form large wounds.</li> <li>Wounds are common on the neck, shoulders, flanks and hind legs.</li> <li>Pus can be discharged from wounds over a period of several months.</li> <li>Loss of appetite and reduced milk production.</li> </ul>	<ul style="list-style-type: none"> <li>Take a few fruits of <i>Solanum aculeastrum</i>, crush and squeeze out the juice. Apply the juice to the wounds for a week or more until the pus dries up and wounds start to heal.</li> <li><b>CAUTION: Wear hand protection (plastic bags over the hands or surgical gloves) when applying this treatment, and wash hands thoroughly with soap and water afterwards, because <i>Solanum aculeastrum</i> fruit are poisonous.</b></li> <li>Cut some fresh branches or bark of <i>Euphorbia robecchii</i>. Collect the white sap that exudes. Using a brush made from small branches, cover affected areas with sap.</li> </ul>
Lumpy skin disease		<ul style="list-style-type: none"> <li>Swollen lymph nodes cover the skin of the animal.</li> <li>Many lumps on the skin turn into sores that become infected and result in deep wounds that damage the hide of the animal.</li> <li>Body temperature is very high, legs are swollen.</li> <li>Drooling, clear discharge from the eyes and nose. Later, discharge from the nose becomes grey/white.</li> <li>The animal stops eating, is tired and weak.</li> <li>In females, abortion and reduced milk production.</li> </ul>	<ul style="list-style-type: none"> <li>Crush 2 kg of fresh seed of <i>Solanum incanum</i> and mix with 2 l of water. Rub the animal's body with this mixture and then rub with <i>Ricinus communis</i> oil (castor oil) or animal fat.</li> <li>Crush a handful of fresh leaves of <i>Harrisonia abyssinica</i> and 1 fresh leaf of <i>Aloe secundiflora</i>. Collect the juice and apply to sores.</li> <li>Take a handful of fresh leaves and a handful of roots of <i>Harrisonia abyssinica</i> and pound into a paste. Apply to sores.</li> <li>Smear used engine oil over the animal's entire body.</li> <li>Wash the animal with warm salty water. Mix ash with a little water to make a paste and rub the animal's body. Repeat every day until the animal recovers.</li> </ul>
Pox		<ul style="list-style-type: none"> <li>Small red patches on the skin, usually around the mouth, on the head, under the tail and between the legs.</li> <li>The patches become swellings under the skin that turn into blisters that break and become open sores which soon develop scabs.</li> <li>Animals often have distressed breathing due to blisters inside the lungs.</li> <li>Most animals have a lack of appetite, become thin and weak, with high fever and shivering.</li> <li>Watery discharge from the nose and eyes, drooling.</li> <li>Pregnant animals often abort.</li> </ul>	<ul style="list-style-type: none"> <li>Mix half a cup of salt with 1 l of warm water. Wash infected areas daily until they clear.</li> <li>Add a handful of fresh pounded roots of <i>Microglossa pyrifolia</i> and a few fresh ground leaves of <i>Agave sisalana</i> and <i>Aloe secundiflora</i> to 2 l of water. Boil for 30 minutes, cool and sieve. Drench with 1 l of liquid twice a day. (Treatment for donkeys, goats and sheep.) Give the same mixture to infected chickens instead of drinking water (not as a drench).</li> <li>Take a few seed of <i>Azadirachta indica</i> and crush to form a paste. Apply the paste to affected areas until they clear. (Treatment for all animals.)</li> <li>Pound fresh bark of <i>Azadirachta indica</i> with a little water and apply the juice to sores. (Treatment for all animals.)</li> <li>Pound 0.5 kg of dried leaves of <i>Acalypha fruticosa</i> to a powder. Mix with 0.5 kg of butterfat or ghee to form a paste and apply once to affected areas. (Treatment for all animals.)</li> </ul>
Orf (contagious pustular dermatitis, contagious ecthyma)		<ul style="list-style-type: none"> <li>Swollen lips and swollen head; swollen lymph nodes on the head (camels).</li> <li>Small pimples, swellings and lesions around the mouth; small raised sores on the skin.</li> <li>Suckling young have sores around the lips and eyes; they stop suckling due to internal mouth sores.</li> <li>Older animals usually have sores on legs and feet.</li> <li>Mothers have sores on their teats and udder.</li> <li>Several small sores often join together and have thick scabs over them; some scabs break off and bleed.</li> <li>Animals feverish.</li> </ul>	<ul style="list-style-type: none"> <li>Mix a quarter of a cup of salt with 2 l of warm water. Wash affected areas once a day until they clear. (Treatment for all animals.)</li> <li>Crush 0.5 kg of <i>Acacia nilotica</i> pods and mix with 2 l of water. Leave for 30 minutes. Strain the mixture and wash the affected areas with the liquid once a day until the animal recovers. (Treatment for camels.)</li> </ul>






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### 2.4.3 Remedies for digestive diseases and abdominal illnesses


Parasite name	Image	Signs	Treatment
Bloat (tympany)		<ul style="list-style-type: none"> <li>The abdomen is large on the left side.</li> <li>Distressed breathing and protrusion of the tongue.</li> <li>The animal stops eating and has a little diarrhoea.</li> <li>The animal tries to urinate and defecate frequently.</li> <li>Sometimes green froth comes out of the nose and mouth.</li> <li>The animal may collapse and die quickly.</li> </ul>	<ul style="list-style-type: none"> <li>Mix 0.5 kg of Magadi soda with 1 l of water and drench adult cattle with the mixture. For calves, goats and sheep, drench with 0.5 l. Use 2 l for adult camels. (Treatment for cattle, camels, goats and sheep.)</li> <li>Drench adult cattle with 4 l of fresh milk. For calves, goats and sheep, drench with 2 l. Animals will recover within 1 to 3 hours. (Treatment for all animals.)</li> <li>Keep the bloated animal running until it passes gas. (Treatment for goats and sheep.)</li> <li>Mix 0.5 l of edible oil with 0.5 kg of fresh crushed leaves of <i>Vernonia amygdalina</i> and 2 teaspoons of salt. Drench adult cattle and camels with the full volume of this mixture. For calves, goats and sheep, drench with 0.25 l. (Treatment for all animals.)</li> <li>If an animal is suffering from 'sudden bloat' (i.e., the left side of the abdomen is very swollen, the animal can hardly breathe, the animal lies on the ground, and the legs are stiff and spread when standing), puncture the swollen part of the stomach (e.g., with the reverse end of a spear, knife or large needle). After the gas has been released, smear animal fat or butter on the wound. (Treatment for cattle and camels.)</li> </ul>
Diarrhoea		<ul style="list-style-type: none"> <li>Frequent, loose stool.</li> <li>Faeces may contain blood or mucus, smell strangely and have an unusual colour.</li> <li>The animal is weak, has no appetite, stops ruminating and loses weight.</li> <li>The animal becomes dehydrated if diarrhoea continues for long; as a result, the coat becomes dry and rough, the eyes are sunken and the animal urinates less than normal.</li> </ul>	<ul style="list-style-type: none"> <li>Crush 0.5 kg of fresh <i>Acacia seyal</i> bark and boil in 0.5 l of water for 10 minutes. Cool, sieve off the liquid and drench cattle and camels with the full volume. Use 0.3 l of the liquid for calves, goats and sheep. (Treatment for camels, cattle, sheep and goats.)</li> <li>Place 0.5 kg of fresh bark from the roots of <i>Acacia oerfota</i> in 1 l of hot water and leave standings for 20 to 30 minutes. Sieve and use the liquid to drench the affected animal once a day for 2 or 3 days. Use 1 l as a drench for cattle, 0.5 l for sheep and goats. (Treatment for cattle, sheep and goats.)</li> <li>Pound a handful of fresh leaves of <i>Aloe secundiflora</i> to extract the juice. Mix the juice with 2 l of water. Give to affected animals as their drinking water. Continue daily until the animals recover. (Treatment for cattle, sheep, goats, dogs, donkeys and chicken.)</li> <li>Chop 2 or 3 red, hot <i>Capsicum frutescens</i> fruit and mix with 0.5 l of water. Present to animals as drinking water. (Treatment for poultry.)</li> <li>Crush a few long pieces of fresh <i>Commiphora africana</i> bark and soak in 2 l of water until the water turns red. Give the liquid to affected animals to drink instead of regular water. (Treatment for cattle, sheep and goats.)</li> <li>Crush a handful of fresh <i>Grewia similis</i> roots and boil in 0.5 l of water for 10 minutes. Cool and sieve. Use the liquid as a drench. Give 0.5 l to cattle and camels, 0.25 l to goats and sheep, three times a day for 2 days. (Treatment for cattle, camels, sheep and goats.)</li> <li>Pound 0.5 kg of tender leaves of <i>Psidium guajava</i> with a piece of fresh <i>Zingiber officinale</i> root (rhizome). Boil the mixture in 1 l of water for 10 minutes. Add half a teaspoon of salt. Drench cattle and camels once with 1 l of the mixture, use 0.5 l for smaller stock. (Treatment for cattle, camels, sheep and goats.)</li> </ul>



Parasite name	Image	Signs	Treatment
			<ul style="list-style-type: none"> <li>Crush 0.5 kg of <i>Zanthoxylum chalybeum</i> seed and mix with 2 l of warm water.</li> <li>Use the liquid immediately as a drench. Give 2 l to cattle and camels, 1 l to goats, sheep and calves once. (Treatment for camels, cattle, sheep and goats.)</li> <li>Stir 5 tablespoons of sugar and 1 tablespoon of salt into 2 l of water. Drench with 2 l for cattle, 1 l for calves, goats and sheep. (Treatment for dehydration caused by diarrhoea for cattle, goats and sheep.)</li> </ul>
Constipation		<ul style="list-style-type: none"> <li>Hard, pelleted, dry faeces.</li> <li>Animal forcing or straining to pass stool.</li> <li>No faeces from the animal over a whole day.</li> </ul>	<ul style="list-style-type: none"> <li>Take half a cup of fresh, crushed <i>Carica papaya</i> seed and force the affected animal to eat. Alternatively, crush the seed, mix with water and use once as a drench. (Treatment for cattle, goats and sheep.)</li> <li>Dose cattle and camels with 0.5 l of <i>Ricinus communis</i> oil (castor oil). Use</li> <li>0.25 l for goats and sheep. (Do not overdose.) (Treatment for cattle, camels, goats and sheep.)</li> <li>Dissolve 0.25 kg of Magadi soda in 2 l of water. Use 2 l to drench cattle and camels, 0.5 l for goats and sheep. (Treatment for cattle, camels, goats and sheep.)</li> </ul>
Coccidiosis		<ul style="list-style-type: none"> <li>Diarrhoea with blood and mucus in the faeces in animals with coccidiosis.</li> <li>Profuse watery diarrhoea in the case of animals with colibacillosis.</li> <li>Loss of appetite, loss of weight, weakness and sluggishness.</li> <li>Calves do not suckle.</li> <li>Dehydration.</li> <li>The animal's hair/sheep's wool breaks easily.</li> <li>Little or no fever.</li> </ul>	<ul style="list-style-type: none"> <li>Crush a leaf of <i>Aloe secundiflora</i> and mix with 1 l of warm water. Give this to affected poultry as drinking water. (Treatment for poultry.)</li> <li>Crush a handful of fresh bark of <i>Acacia mellifera</i> or <i>Acacia xanthophloea</i> and soak in 1 l of cold water for 6 to 7 hours. Sieve and drench with 1 l of the liquid every morning until the animal recovers. (Treatment for calves, goat kids and lambs.)</li> <li>Pound 0.2 kg of fresh roots of <i>Cissus quadrangularis</i> and mix with 0.5 l of water. Leave for 12 hours. Sieve and drench the sick animal with the liquid. Repeat morning and evening on a single day. The animal should not be allowed to suckle for 12 hours before treatment starts. (Treatment for suckling camels and calves.)</li> </ul>
Fowl typhoid		<ul style="list-style-type: none"> <li>Very high fever.</li> <li>Profuse watery diarrhoea that smells bad and contains blood and mucus.</li> <li>Pregnant animals often abort.</li> <li>Severe dehydration, loss of appetite and weakness.</li> <li>In severe cases, cattle may kick their own stomachs to relieve pain.</li> <li>Animals at any age can contract severe salmonellosis and collapse and die rapidly.</li> </ul>	<ul style="list-style-type: none"> <li>Crush 1 big leaf of <i>Aloe secundiflora</i> and mix with 5 l of water. Use as a drench. On the first day, drench calves with 1.5 l, repeat after 2 hours and give a third dose in the evening. For the next 3 days, drench with 1.5 l once a day. (Treatment for calves.)</li> <li>Crush 1 leaf of <i>Aloe secundiflora</i> and mix with 1 l of water. Give the liquid to chicks and chicken as their drinking water. (Treatment for chickens.)</li> <li>Chop and pound 0.5 kg of fresh bark of <i>Azadirachta indica</i>. Take the extracted juice and mix with regular feed. (Treatment for cattle and chickens.)</li> <li>Chop 0.5 kg of fresh young leaves of <i>Croton megalocarpus</i> and soak in 2 l of water. Leave for 3 to 5 minutes until the water turns green. Give the liquid to chicks as their drinking water for up to 3 days. (Treatment for chickens.)</li> <li>Stir 5 tablespoons of sugar and 1 tablespoon of salt into 2 l of water as a rehydrating solution. Drench with 2 l for cattle, 1 l for calves, goats and sheep. (Treatment for dehydration caused by diarrhoea for cattle, goats and sheep.)</li> </ul>

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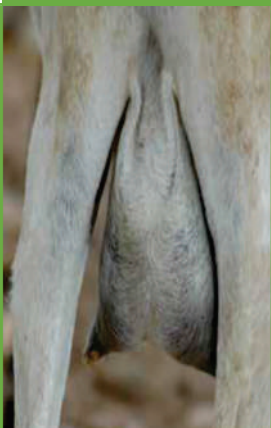

## 2.4.4 Remedies for endoparasites (internal parasites)

Parasite name	Image	Signs	Treatment
Stomach and intestinal worms	 <p>A sheep with bottle jaw.</p>	<p>General signs:</p> <ul style="list-style-type: none"> <li>• The animal often stops eating and becomes skinny, weak and tired.</li> <li>• Some animals feed well but grow slowly.</li> <li>• Rough coat.</li> <li>• Enlarged belly and swelling at the throat (sometimes known as bottle jaw).</li> <li>• With severe disease due to lungworms, animals cough and have distressed breathing.</li> <li>• Diarrhoea and dehydration; faeces sometimes contain blood and mucus.</li> <li>• Pale mucous membranes.</li> <li>• Sometimes animal has severe abdominal pain.</li> <li>• In dead animals it is sometimes possible to see larger worms, but others are too small to see easily.</li> <li>• Animals do not have a fever.</li> <li>• In birds:</li> <li>• Feathers appear rough and some fall out.</li> <li>• Reduction in egg laying.</li> <li>• Some young birds may die.</li> </ul>	<ul style="list-style-type: none"> <li>• Take 0.5 kg of <i>Carissa spinarum</i> roots and 1.5 kg of <i>Cucurbita maxima</i> leaves. Boil in 3 to 4 l of water for 45 minutes. Filter off the liquid, cool and use as a drench, twice in 1 day. Repeat after 1 month. (Treatment for cattle, goats and sheep.)</li> <li>• Crush 2 kg of fresh roots of <i>Rhus vulgaris</i> and leave in 1 l water overnight. Sieve and drench cattle with 0.5 l of the liquid once a day for a week (half this dose for sheep, goats and calves). Give to animals only after they have been fed. (Treatment for cattle, goats and sheep.)</li> <li>• Crush 0.25 kg of <i>Myrsine africana</i> leaves, add to 0.5 l water and stir. Filter off the liquid and drench cattle, camels and donkeys with the full volume, once daily for 2 days (half this dose for sheep, goats and calves). (Treatment for camels, cattle, goats, sheep and donkeys.)</li> <li>• Chop or crush 2 bulbs of <i>Allium sativum</i> and mix with 4 l of water. Drench with</li> <li>• 0.25 l to 0.5 l of the liquid twice a day for 2 days. (Treatment for cattle, goats and sheep.)</li> <li>• Take 2 or 3 fresh fruit of <i>Hagenia abyssinica</i>, crush and add 0.5 l of water. Drench cattle with the full volume of the liquid once daily for 2 days (half this dose for sheep and goats). (Treatment for cattle, goats and sheep.)</li> <li>• Take a small piece of <i>Zingiber officinale</i> root (rhizome) and 2 fruit of <i>Capsicum frutescens</i>, crush and mix with 1 l of water. Give as drinking water to chickens. If birds will not drink the mixture, drench them with it (2 teaspoonfuls for chicks, 2 tablespoonfuls for adult birds). (Treatment for chickens.)</li> </ul>
Lungworms (ascaris worms)	-	<ul style="list-style-type: none"> <li>• Coughing and distressed breathing.</li> <li>• Stunted growth.</li> <li>• On examining dead animals, worms can be found in the windpipe and lungs.</li> </ul>	<ul style="list-style-type: none"> <li>• Grind <i>Lantana trifolia</i> fruit and mix a handful with 1 l of water. Drench the animal with this mixture. Use 1 l for adult cattle and 0.25 l for calves, sheep and goats. (Treatment for cattle, sheep and goats.)</li> <li>• Take 0.25 kg of fresh bark of <i>Trichilia emetica</i> and soak in 2 l of water for 6 hours. Sieve and use the liquid to drench the sick animal. Use 2 l for large animals and 0.5 l for small animals. (Treatment for camels, cattle, dogs, sheep and goats.)</li> <li>• Crush 0.5 kg of <i>Albizia anthelmintica</i> bark and add to 2 l of water. Allow to stand for 6 hours. Sieve and use the liquid to drench the sick animal. (Treatment for camels, cattle, dogs, sheep and goats.)</li> <li>• Pound 0.5 kg of <i>Albizia anthelmintica</i> roots and boil in 1 l of water. Sieve and use the liquid as a drench. Administer 1 l for cattle, 0.25 l for calves, sheep and goats. (Treatment for cattle, sheep and goats.)</li> <li>• Pound 0.5 kg of fresh <i>Albizia coriaria</i> bark and add to the drinking water of</li> <li>• sick animals. (Treatment for cattle, sheep and goats.)</li> </ul>
Liver fluke disease (fasciolosis)	-	<ul style="list-style-type: none"> <li>• The animal is thin and weak, tires easily and stops eating.</li> <li>• Rough coat and pale mucous membrane.</li> <li>• The animal often has diarrhoea; the faeces contain some blood.</li> <li>• Coughing, especially at night.</li> <li>• Enlarged belly and swelling at the throat (bottle jaw).</li> <li>• Loss of milk production.</li> </ul>	<ul style="list-style-type: none"> <li>• Take 2 fruit of <i>Solanum incanum</i> and a little crushed limestone (calcium carbonate) and boil in 1 l of water. Drench the animal with the liquid. (Treatment for cattle.)</li> <li>• The remedies above for stomach, intestinal and lungworms can also be used to treat liver fluke disease.</li> </ul>


Parasite name	Image	Signs	Treatment
		<ul style="list-style-type: none"> <li>Some animals die before they have any signs of the disease; usually, animals are very sick for a few days and then partially recover.</li> <li>Animals do not usually have fever.</li> <li>In dead animals with acute disease, the liver is large and dark, there is much red/brown liquid in the abdomen (especially in sheep and goats) and the flesh is often pale coloured. The bile ducts in the liver may be thicker than normal; when cut, the worms can be seen.</li> </ul>	

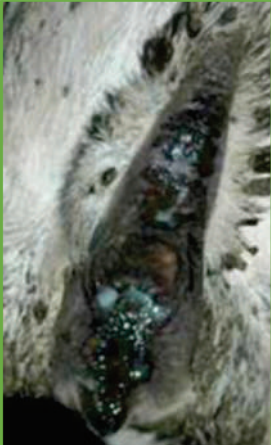
**Source:** Dharani N, Yenesew A, Aynekulu E, Twei B, Jamnadass R (2015) Traditional ethnoveterinary medicine in East Africa: a manual on the use of medicinal plants. Dawson IK ed. The World Agroforestry Centre (ICRAF), Nairobi, Kenya.

## 2.4.5 Remedies for reproductive and other infectious diseases

Parasite name	Image	Signs	Control/treatment
Mastitis		<ul style="list-style-type: none"> <li>Animals produce less milk, which is in abnormal in colour, consistency (lumpy, Watery) and smell; sometimes the milk is stained with blood and is pink.</li> <li>Swollen, red and tender teats; sometimes with wounds, abscesses and cracks; the udder can feel hot when touched.</li> <li>The animal is restless when milked or suckled by young.</li> <li>The udder sometimes contains hard lumps that are painful to the animal when touched.</li> <li>In cases of severe mastitis, the udder can become dark blue/black and feels cold when touched.</li> <li>If contagious agalactia is not treated, the animal stops producing milk, becomes weak, tired and feverish, and stops eating.</li> <li>Other signs of contagious agalactia include swollen joints and lameness, a clear discharge from eyes, blindness, and pneumonia in young animals.</li> </ul>	<ul style="list-style-type: none"> <li>Pound a handful of <i>Ajuga remota</i> leaves and stems and add a little water to make a paste. Apply directly onto the udder once a day for 7 days. (Treatment for all animals.)</li> <li>Sieve wood ash remaining from cooking to produce a powder. Mix with water to produce a paste. Apply the paste to the udder of the cow. Repeat daily until the condition has cleared. (Treatment for cattle.)</li> <li>Crush a handful of leaves of <i>Sesbania sesban</i> and mix with a quarter of a cup of warm butter or cream. Leave for 5 to 10 minutes and then rub the mixture on the affected area. Repeat daily until the condition has cleared. (Treatment for cattle, goats and sheep.)</li> <li>Burn dry dung from cattle or donkeys in a pot placed under the udder of the</li> <li>Sick animal until it sweats. Repeat twice a day until the animal's condition improves. (Treatment for cattle and goats.)</li> </ul>
Retained placenta		<ul style="list-style-type: none"> <li>The placenta has not been discharged 12 hours after giving birth.</li> <li>The placenta hangs from the vulva and looks and smells rotten</li> </ul>	<ul style="list-style-type: none"> <li>Wash hands and an arm with soap and water, insert the arm into the vagina, grip the placenta and gently pull it out. If possible, wear a clean plastic bag or surgical glove over the inserted hand during the procedure. If the placenta does not pull out easily, leave it there and use one of the treatments below (otherwise, the uterus may be damaged by pulling).</li> </ul>


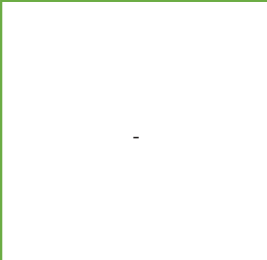



Parasite name	Image	Signs	Control/treatment
			<ul style="list-style-type: none"> <li>• Pound 0.5 kg of <i>Moringa stenopetala</i> bark and mix with 1 l of warm water. Sieve and give the mixture as a drench to animals. Use 1 l for a cow, 0.5 l for a sheep or goat. Repeat until the placenta is discharged. (Treatment for cattle, sheep and goats.)</li> <li>• Crush 0.5 kg of <i>Salvadora persica</i> roots and soak in 1 l of water for 12 hours. Use the liquid as a drench. Give 1 l to large stock, 0.5 l to smaller animals. Repeat daily until the placenta is expelled. (Treatment for all livestock.)</li> <li>• Place a handful of fresh stems of <i>Cissus quadrangularis</i> and half a cup of wood ash in 0.5 l of water. Leave for 10 to 15 minutes. Sieve and give the liquid as a drench to animals, 0.5 l for large animals and 0.25 l for small stock. Administer twice a day until the placenta is discharged. (Treatment for all livestock.)</li> <li>• Crush 0.5 kg of roots or bark of <i>Balanites aegyptiaca</i> and place in 1 l of water. Boil for 10 minutes. Cool, sieve and drench with 1 l for cows, donkey and camels, 0.5 l for sheep and goats. Repeat once. (Treatment for all livestock.)</li> <li>• Crush 0.25 kg of fresh leaves and 0.25 kg of fresh roots of <i>Harrisonia abyssinica</i> and boil for 15 to 20 minutes in 1 l of water. Cool, sieve and drench the affected animal with all of the liquid. The placenta should be discharged between 1 and 2 hours later. (Treatment for cattle.)</li> <li>• Cut into small pieces and crush 0.5 kg of root bark of <i>Acacia drepanolobium</i>. Soak in 2 l of water overnight and then boil until the water turns reddish- black. Allow to cool and present to the affected animal as drinking water. The placenta should be discharged between 1 and 3 hours later. (Treatment for camels and goats.)</li> <li>• Crush 10 large leaves of <i>Carica papaya</i> and place in 2 l of water. Drench large animals with 1 l of the liquid in the morning and 1 l in the evening. Use half this dose for small stock. The next day the placenta should be discharged. (Treatment for all animals.)</li> </ul>
Brucellosis		<ul style="list-style-type: none"> <li>• Foetuses abort, usually after 5 to 6 months for cows. Retention of the placenta afterwards.</li> <li>• Birth of a dead calf at full term. Retention of the placenta afterwards.</li> <li>• Bulls often have swollen joints and very hard, swollen testicles. The swelling lasts for a long period and when it reduces the animal is usually sterile.</li> <li>• In cows, infection of the uterus can cause sterility.</li> </ul>	<ul style="list-style-type: none"> <li>• Crush 0.5 kg of fresh roots of <i>Salvadora persica</i> and boil in 5 l of water for 1 hour. Cool, sieve and use the liquid as a drench for animals that have aborted. Use 2 l for cows, 1 l for goats and sheep. Drench once only. (Treatment for cattle, goats and sheep.)</li> <li>• Take 2 kg of dry <i>Kigelia africana</i> fruit and grind into a fine powder. Mix with 1 kg of powdered horse bone and 18 kg of salt. Present as a supplement to affected animals every day for 1 month. (Treatment for all animals.)</li> </ul>
Venereal diseases		<ul style="list-style-type: none"> <li>• Abortion and delayed breeding; females do not become pregnant after mating.</li> <li>• Cows abort before the 4th month of pregnancy.</li> <li>• White discharge from the vulva of females.</li> <li>• Male animals may not show any signs of disease initially.</li> <li>• Discharge from the penis of male goats and sheep in severe cases</li> </ul>	<ul style="list-style-type: none"> <li>• Dry 0.25 kg of leaves of <i>Acalypha fruticosa</i> in the sun and crush into a powder. Apply directly to the birth opening (vulva) of the female animal. (Treatment for cattle, camels, donkeys, goats and sheep.)</li> <li>• Take the soft inner bark of <i>Acacia oerfota</i> and fold into a small ball. Tie with a string and insert into the birth canal, with the end of the string hanging out of the vulva. Leave overnight and remove the next day. (Treatment for all livestock.)</li> <li>• Squeeze the juice from a leaf of <i>Aloe secundiflora</i> and apply directly to the genitalia. (Treatment for goats, sheep and donkeys.)</li> </ul>

Parasite name	Image	Signs	Control/treatment
			<ul style="list-style-type: none"> <li>• Soak a handful of inner bark of <i>Acacia drepanolobium</i> in 1 l of water for half an hour. Wash the animal's genitalia with the infusion. Repeat once a day until the animal recovers. (Treatment for cattle, goats and sheep.)</li> <li>• Wash the animal's genitalia with warm water mixed with Magadi soda or ordinary salt. Take the paste from crushed <i>Azadiracta indica</i> seed and apply. Repeat once a day until the animal recovers. (Treatment for all animals.)</li> </ul>
Metritis (infected uterus and vaginal discharge)		<ul style="list-style-type: none"> <li>• A cloudy white discharge from the vulva, which does not smell particularly badly.</li> <li>• The animal does not show any signs of sickness or fever.</li> </ul> <p>Severe infection:</p> <ul style="list-style-type: none"> <li>• Yellow or dark brown discharge from the vulva that smells very badly.</li> <li>• The animal is feverish, very sick and stops eating.</li> <li>• The animal lies down and will not stand up.</li> <li>• Sometimes the animal dies after a few days</li> </ul>	<ul style="list-style-type: none"> <li>• Ensure the location where an animal gives birth is clean and dry.</li> <li>• Wash your hands and arms and wear plastic bags or gloves if inserting your hand into the animal's body to help in giving birth.</li> </ul>
Sheath rot (discharge from the penis)		<ul style="list-style-type: none"> <li>• Waxy scabs and wounds on the penis sheath that ooze pus.</li> <li>• A white or yellow discharge from the penis.</li> </ul>	<ul style="list-style-type: none"> <li>• Dry 0.25 kg of leaves of <i>Acalypha fruticosa</i> in the sun and crush into a powder. Apply directly to the birth opening (vulva) of the female animal. (Treatment for cattle, camels, donkeys, goats and sheep.)</li> <li>• Take the soft inner bark of <i>Acacia oerfota</i> and fold into a small ball. Tie with a string and insert into the birth canal, with the end of the string hanging out of the vulva. Leave overnight and remove the next day. (Treatment for all livestock.)</li> <li>• Squeeze the juice from a leaf of <i>Aloe secundiflora</i> and apply directly to the genitalia. (Treatment for goats, sheep and donkeys.)</li> <li>• Soak a handful of inner bark of <i>Acacia drepanolobium</i> in 1 l of water for half an hour. Wash the animal's genitalia with the infusion. Repeat once a day until the animal recovers. (Treatment for cattle, goats and sheep.)</li> <li>• Wash the animal's genitalia with warm water mixed with Magadi soda or ordinary salt. Take the paste from crushed <i>Azadiracta indica</i> seed and apply. Repeat once a day until the animal recovers. (Treatment for all animals.)</li> <li>• CAUTION: Wear hand protection (plastic bags over the hands or surgical gloves) when applying treatments. Wash hands thoroughly with soap and water afterwards to avoid infection.</li> </ul>

**Source:** Dharani N, Yenesew A, Aynekulu E, Tuei B, Jamnadass R (2015) Traditional ethnoveterinary medicine in East Africa: a manual on the use of medicinal plants. Dawson IK ed. The World Agroforestry Centre (ICRAF), Nairobi, Kenya.




## 2.5 Remedies for eye diseases and problems

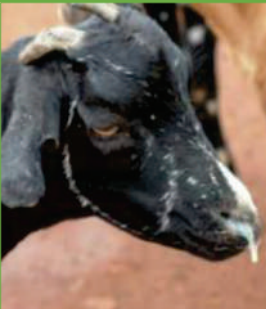
Parasite name	Image	Signs	Control/treatment
Pink-eye (kerato-conjunctivitis)		<ul style="list-style-type: none"> <li>Discharge from one or both eyes; the discharge may be clear, white or yellowish.</li> <li>The mucous membrane under the eyelid becomes red and swells; the eye may bulge out and be injured; partial or complete closure of the eye.</li> <li>The animal avoids strong sunlight and blinks frequently.</li> <li>In severe cases, the eye can be lost.</li> </ul>	<ul style="list-style-type: none"> <li>Burn leaves and stems of <i>Combretum molle</i> and crush the ash to a fine powder. Apply the powder directly to infected eyes. (Treatment for cattle, goats and sheep.)</li> <li>Burn a few pieces of <i>Euphorbia candelabrum</i> stem and crush the ash to a fine powder. Apply the powder directly to infected eyes. (Treatment for cattle, goats, camels and sheep.)</li> <li>Dissolve 2 tablespoons of salt in a cup of fresh milk. Using a clean syringe (without the needle) or a straw, wash infected eyes with this solution twice a day until the animal recovers. (Treatment for all animals.)</li> <li>CAUTION: Wash hands thoroughly with soap and water after applying treatments, to prevent cross-infection (including of self). Be careful not to cross-contaminate the non-infected eye of an animal that has only one infected eye.</li> </ul>
Eyeworms (thelaziosis)		<ul style="list-style-type: none"> <li>A clear discharge may come from one or both eyes. Occasionally the discharge becomes white, grey or yellow.</li> <li>Thin, white worms (about 2 cm long) can be seen on the surface of the eye.</li> <li>Infected animals avoid bright light.</li> </ul>	<ul style="list-style-type: none"> <li>Pound or chew fresh fibrous bark of <i>Piliostigma thonningii</i>. Squeeze out the juice and apply it directly to the infected eye, daily for 3 to 7 days. (Treatment for all animals.)</li> <li>Squeeze out the juice from 3 or 4 fresh <i>Nicotiana tabacum</i> leaves. Apply 3 drops of juice into the infected eye, daily for 3 days. Apply 1 drop a day for chickens. (Treatment for cattle, goats, camels, sheep, chicken.)</li> </ul>
Poison-in-the-eye		<ul style="list-style-type: none"> <li>Tears from the eye, which may be slimy or pus-like.</li> <li>Swollen red eye.</li> <li>Partially or completely closed eye.</li> <li>A thick-whitish film that may develop later and cover the eye.</li> <li>The animal is restless and shakes its head frequently.</li> </ul>	<ul style="list-style-type: none"> <li>Put 3 to 5 drops of fresh milk into the affected eye. Repeat a few hours later and continue treatment at further intervals if symptoms persist. (Treatment for donkeys, cattle, goats, camels and sheep.)</li> <li>Crush 1 leaf of <i>Aloe secundiflora</i> and collect the juice. Put 5 drops daily into an affected eye until the animal recovers. (Treatment for cattle, goats, camels and sheep.)</li> <li>Grind dry seed of <i>Boscia coriacea</i> to a fine powder. Put a pinch of powder directly into the eye twice a day until it heals. (Treatment for donkeys, cattle, goats, camels and sheep.)</li> <li>Grind <i>Acacia mellifera</i> leaves to a fine powder. Clean the eye with warm water. Apply a pinch of powder into the affected eye. (Treatment for donkeys, cattle, goats, camels and sheep.)</li> <li>Grind a handful of dried <i>Balanites aegyptiaca</i> leaves to a powder. Put a teaspoonful of powder in hot water, stir, strain the mixture and apply the solution to the affected eye twice daily until it heals. (Treatment for donkeys, cattle, goats, camels and sheep.)</li> <li>Crush 10 g of chewing tobacco (from <i>Nicotiana tabacum</i>), add 2 tablespoons of water, mix thoroughly and strain the mixture. Put several drops into the affected eye. Apply to only one eye at a time, as the treatment may cause temporary blindness. Repeat if necessary. (Treatment for donkeys, cattle, goats, camels and sheep.)</li> </ul>

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## 2.5.1 Remedies for respiratory diseases

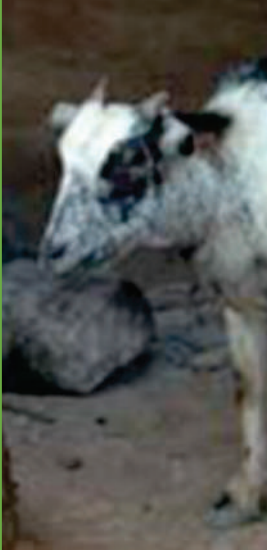

Parasite name	Image	Signs	Control/treatment
Colds, coughs and pneumonia		<ul style="list-style-type: none"> <li>Discharge from the nose, mouth and eyes. If creamy, sticky and yellowish, see contagious pleuropneumonia (2.2.7.5) and other bacterial infections. If watery, see foot-and-mouth disease (2.2.8.7), and avian coryza (2.2.7.3) and fowl cholera (2.2.7.4) (for chickens).</li> <li>Coughing and sneezing.</li> <li>In the case of pneumonia, difficult, distressed and faster breathing.</li> <li>Animals with pneumonia usually have a fever.</li> <li>Weakness and reduced appetite.</li> <li>Snoring and gasping for air in chickens.</li> </ul>	<ul style="list-style-type: none"> <li>Crush a few leaves of <i>Aloe secundiflora</i> and mix with 1 l of water. Leave for 15 minutes. Sieve and present the liquid as drinking water until the animal recovers. (Treatment for all animals.)</li> <li>Grind a handful of <i>Zanthoxylum chalybeum</i> seed into powder. Put the powder into the animal's mouth and pour 0.5 l of water down the throat to cause swallowing. Repeat once a day for 3 days. (Treatment for camels.)</li> <li>Dissolve 0.25 kg of Magadi soda in 2 l of water and give as a drench to the affected animal. Repeat every 4 days until the animal recovers. (Treatment for camels.)</li> <li>Crush a few cloves of <i>Allium sativum</i> and mix with 0.5 l of water. Use as a drench to help recovery from breathing problems. (For all animals; use 0.5 l for large animals, less for smaller ones.)</li> <li>Crush a handful of <i>Capsicum frutescens</i> seed and mix with 1 l of water. Present the liquid as drinking water for 2 to 3 days. (Treatment for chickens.)</li> </ul>
Avian coryza (infectious coryza)		<ul style="list-style-type: none"> <li>Swollen head and face.</li> <li>Swollen watering eyes and discharge from the nostrils; discharge from the nostrils is first clear, later white/yellow with a bad odour.</li> <li>Distressed, noisy breathing and frequent sneezing.</li> <li>Drop in egg production or no eggs.</li> <li>Birds shake their heads and stretch their necks out.</li> </ul>	<ul style="list-style-type: none"> <li>Crush a few leaves of <i>Aloe vera</i> or <i>Aloe secundiflora</i> and place in 1 l of water. Present to birds as drinking water.</li> <li>Crush together 4 or 5 red fruit of <i>Capsicum frutescens</i>, 1 leaf of <i>Aloe secundiflora</i> and a handful of <i>Amaranthus hybridus</i> leaves and flowers. Soak in 2 l of water for 4 to 6 hrs. Present the liquid to birds as drinking water. If birds refuse to drink, drench adult birds with 2 tablespoonfuls twice a day until they recover. For young birds, drench with one tablespoonful twice a day.</li> </ul>
Newcastle disease (fowl pest)		<ul style="list-style-type: none"> <li>Watery, whitish or greenish bloody diarrhoea with a very unpleasant odour.</li> <li>Coughing, sneezing and discharge from the nostrils.</li> <li>Distressed breathing.</li> <li>Birds stop eating, become weak and stop laying eggs.</li> <li>Drooping wings and dragging legs, restlessness and sleepiness.</li> <li>Swelling of the head and neck; head and neck twisted to one side; walking in circles.</li> <li>Convulsion, paralysis and death.</li> </ul>	<ul style="list-style-type: none"> <li>Crush a few leaves of <i>Aloe secundiflora</i> or <i>Aloe vera</i> and soak in 1 l of water. Leave for 30 minutes. Strain off the liquid and present as drinking water to birds for 3 days.</li> <li>Crush 2 handfuls of <i>Capsicum frutescens</i> seed and mix with 1 l of water. Present the liquid as drinking water to birds for 3 days. Make afresh every day.</li> <li>Crush together 4 or 5 fruit of <i>Capsicum frutescens</i>, 1 or 2 leaves of <i>Aloe secundiflora</i> and a handful of <i>Amaranthus hybridus</i> leaves. Soak in 2 l of water for 6 hrs. Drench each bird with 2 tablespoonfuls twice a day until recovery. Also leave the mixture for birds to drink.</li> <li>Crush very hot red or green fruit of <i>Capsicum frutescens</i> and leave for sick birds to eat for 2 or 3 days.</li> <li>CAUTION: Wear hand protection (plastic bags over the hands or surgical gloves) when applying treatments. Wash hands thoroughly with soap and water afterwards to prevent cross-contamination.</li> </ul>
Fowl cholera (pasteurellosis)		<ul style="list-style-type: none"> <li>As for avian coryza, except birds have severe watery green/grey/yellow diarrhoea and the feathers around the tail become dirty with faeces. The comb and wattle are hot and dark red in severe fowl cholera. Some birds die suddenly without showing other indications of the disease.</li> </ul>	<ul style="list-style-type: none"> <li>Crush a few leaves of <i>Aloe secundiflora</i> or <i>Aloe vera</i> and soak in 1 l of water. Leave for 30 minutes. Strain off the the liquid and present as drinking water to birds for 3 days.</li> <li>Crush 2 handfuls of <i>Capsicum frutescens</i> seed and mix with 1 l of water. Present the liquid as drinking water to birds for 3 days. Make afresh every day.</li> </ul>

Parasite name	Image	Signs	Control/treatment
			<ul style="list-style-type: none"> <li>Crush together 4 or 5 fruit of <i>Capsicum frutescens</i>, 1 or 2 leaves of <i>Aloe secundiflora</i> and a handful of <i>Amaranthus hybridus</i> leaves. Soak in 2 l of water for 6 hrs. Drench each bird with 2 tablespoonfuls twice a day until recovery. Also leave the mixture for birds to drink.</li> <li>Crush very hot red or green fruit of <i>Capsicum frutescens</i> and leave for sick birds to eat for 2 or 3 days.</li> <li>CAUTION: Wear hand protection (plastic bags over the hands or surgical gloves) when applying treatments. Wash hands thoroughly with soap and water afterwards to prevent cross-contamination.</li> </ul>
Contagious pleuropneumonia (bovine and caprine)		<ul style="list-style-type: none"> <li>Fast, difficult and painful breathing, with grunting.</li> <li>Animal lowers its head, places its front legs wide apart and stretches its head forward, trying hard to draw more air into the lungs.</li> <li>Body temperature very high.</li> <li>Lack of appetite and loss of weight.</li> <li>Rough hair texture.</li> <li>Dry cough, then yellow discharge from the nose.</li> <li>Swelling under the chest.</li> <li>Death in cattle 2 to 3 weeks after symptoms in severe cases. Many goats die 4 to 5 days after symptoms appear.</li> </ul>	<ul style="list-style-type: none"> <li>May only work with animals with mild infections.)</li> <li>Take 1 fresh fruit of <i>Solanum incanum</i>, 2 or 3 fruit of <i>Capsicum frutescens</i>,</li> <li>0.25 kg of fresh <i>Warburgia ugandensis</i> bark, and half a teaspoon of crushed limestone (calcium carbonate). Crush together and place in 1 l of warm water. Leave for 15 to 20 minutes. Sieve the mixture and use the liquid as a drench for sick animals. Use 1 l for cattle, 0.5 l for goats, once daily for 2 or 3 days, making fresh mixture each day. (Treatment for cattle and goats.)</li> <li>Crush 2 or 3 fruit of <i>Capsicum frutescens</i> with 1 fresh fruit of <i>Solanum incanum</i>. Place in 0.5 l of water and add half a teaspoon of crushed limestone (calcium carbonate). Leave for 15 minutes. Sieve the mixture and use the liquid as a drench for sick animals. Use 0.5 l for cattle, 0.25 l for goats, once daily for 2 days (Treatment for cattle and goats.)</li> <li>Crush a handful of fresh roots of <i>Harrisonia abyssinica</i> and place in 1 l of water. Boil for 10 minutes, cool and sieve. Use the liquid as a drench. Use 1 l for cattle, 0.5 l for goats, once daily for 2 days (Treatment for cattle and goats.)</li> </ul>


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## 2.5.2 Remedies for diseases caused by ticks and biting flies

Parasite name	Image	Signs	Treatment
East Coast fever		<ul style="list-style-type: none"> <li>Loss of appetite, weakness and decreased milk production.</li> <li>Rapid breathing and high fever.</li> <li>Coughing and discharge from the nostrils.</li> <li>Swollen lymph nodes, especially under the ear, in front of the shoulder and at the knee.</li> <li>Some animals have diarrhoea with blood spots or mucus in the faeces.</li> <li>Occasionally small red spots on the gums, eyelids and at the base of the tongue.</li> <li>Cattle walk in circles, their back legs may become paralysed.</li> </ul>	<ul style="list-style-type: none"> <li>Take 1 kg of fresh <i>Adansonia digitata</i> leaves and cut into small pieces. Take a few fruit from the same species, crush and mix with the leaves. Add a little saltlick and allow infected animal to eat the mixture freely.</li> <li>Take 0.5 kg of fresh leaves and roots of <i>Vernonia amygdalina</i> or <i>Vernonia auriculifera</i> and of <i>Sesbania sesban</i>. Crush the leaves and mix with 1 l of water. Add a teaspoon of salt and boil for 20 minutes. Drench the sick animal.</li> <li>Take 0.5 kg of fresh bark of <i>Warburgia ugandensis</i> and a few fruit of <i>Solanum incanum</i>, mix with crushed limestone (calcium carbonate) and a little clean water to make a paste. Apply where ticks have bitten the skin.</li> <li>Add 0.5 kg of fresh stem bark of <i>Warburgia ugandensis</i> to 1 l of water, drench cattle with 0.3 l per day for 2 to 3 days.</li> </ul>


Parasite name	Image	Signs	Treatment
Heartwater (cowdriosis)		<ul style="list-style-type: none"> <li>Animals quite suddenly have high fever and lack of appetite.</li> <li>Animal are nervous and uncoordinated, lifting their legs very high when walking and going round in circles.</li> <li>Constant chewing movements.</li> <li>Occasional diarrhoea with blood in faeces.</li> <li>Swollen lymph nodes.</li> <li>The animal constantly blinks and presses its head against objects.</li> <li>Animals collapse, have convulsions and die in one to seven days.</li> <li>In a dead infected animal, a sac around the heart is full of fluid. Cattle have less fluid here than sheep or goats. Watery fluid in the chest and abdomen can be seen.</li> </ul>	<ul style="list-style-type: none"> <li>Boil a handful of roots and a handful of bark of <i>Warburgia ugandensis</i> in 1 l of water. Drench the adult animal (0.3 l per day for cattle, 75 ml per day for sheep) for 2 to 3 days. (Treatment for cattle and sheep.)</li> <li>Take a few fresh fruit of <i>Capsicum frutescens</i> and a few fruit of <i>Solanum incanum</i>, pound them together and mix with crushed limestone (calcium carbonate) and a little clean water to make a paste. Apply where ticks have bitten the skin. (Treatment for cattle, sheep and goats.)</li> <li>Take 0.5 kg of fresh bark of <i>Strychnos henningsii</i>, crush it and boil for 20 minutes in 1 l of water. Cool, strain the mixture and give 0.2 l of the solution to cattle twice a day for 3 days. Use half the dose for sheep and goats. (Treatment for cattle, sheep and goats.)</li> </ul>
Anaplasmosis		<ul style="list-style-type: none"> <li>The animal refuses to eat, becomes weak, feverish, unsteady, tired and thin.</li> <li>The animal is depressed, docile and looks for shade.</li> <li>Milk production drops.</li> <li>Anaemia, jaundice and mucous membranes look yellow; yellow eyes.</li> <li>Little, yellowish urine; constipation and very hard dung.</li> <li>Hair stands on end.</li> <li>The abdomen is swollen.</li> <li>Pregnant cows abort.</li> <li>The flesh of a dead infected animal is pale yellow, the blood thin and watery. The gall bladder is large and full, the spleen large and dark.</li> </ul>	<ul style="list-style-type: none"> <li>Take a handful of fresh bark of <i>Croton megalocarpus</i>, add to 0.5 l of water and boil for 10 to 15 minutes. Cool, sieve and drench the sick animal with the solution. (Treatment for goats, sheep and cattle.)</li> <li>Take 0.5 kg of fresh leaves of <i>Capsicum frutescens</i> and add half a teaspoon of crushed limestone (calcium carbonate). Crush the leaves and boil in 0.5 l of water. Cool, sieve and drench the sick animal with the solution. (Treatment for cattle, goats and sheep.)</li> <li>Take a handful of roots and fruit of <i>Aspilia mossambicensis</i> and 4 fruit of <i>Solanum nigrum</i>. Crush and boil in 1 l of water. Drench the sick animal. (Treatment for cattle.)</li> <li>Take 4 fresh fruit of <i>Solanum nigrum</i>, 0.25 kg of fresh bark of <i>Warburgia ugandensis</i> and half a teaspoon of limestone (calcium carbonate) and place in warm water. Leave for 15 to 20 minutes. Mix thoroughly and sieve. Drench the sick animal with the solution. (Treatment for all animals.)</li> <li>Collect 1 kg of fresh bark of <i>Acacia oerfota</i> and soak in 10 l of water for 2 days. On the third day, stir the mixture and then drench the animal with the solution. Repeat once a day for 5 days. For cattle use a dosage of 2 l, for goats and sheep use half this.</li> </ul>
Babesiosis (redwater fever)		<ul style="list-style-type: none"> <li>Animals scratch, bite or lick the tick-infested area.</li> <li>Animals have very high fever with red urine.</li> <li>Animals are weak, nervous and tired and do not move about or eat much.</li> <li>The mucous membrane is yellow or pale in colour.</li> <li>Distressed and fast breathing, fast heart rate.</li> <li>Some animals die 2 to 4 days after symptoms appear, if no treatment is given.</li> <li>In infected dead animals the meat is yellow and the blood is thin and watery. The liver and lymph nodes are larger than normal.</li> </ul>	<ul style="list-style-type: none"> <li>Boil 0.5 kg of fresh stem bark of <i>Warburgia ugandensis</i> in 1 l of water. Cool and drench the animal with 0.3 l (cattle dosage, reduce for smaller animals) of the liquid per day for 2 to 3 days. (Treatment for cattle, goats and sheep.)</li> <li>Add 2 full tablespoons of dry, powdered <i>Prunus africana</i> bark to 1 l of water. Leave for 2 hours, stir and drench the infected animal with the infusion once a day for 2 days. (Treatment for cattle.)</li> <li>Take 0.5 kg of fresh bark of <i>Acacia oerfota</i> or <i>Acacia dolichocephala</i>. Soak in 1.5 l of water for 12 hours. Drench the sick animal using 1 l of the liquid for cattle, 0.5 l for goats and sheep. Repeat the next day if the animal has not recovered. (Treatment for cattle, goats and sheep.)</li> </ul>



Parasite name	Image	Signs	Treatment
Trypanosomosis/ trypanosomiasis (sleeping sickness, surra)		<ul style="list-style-type: none"> <li>• Loss of appetite, discomfort and deterioration of body condition; very weak, thin animals.</li> <li>• Rough, dull hair and skin, which may become scaly.</li> <li>• Reduced milk production in females.</li> <li>• Abortion in pregnant animals.</li> <li>• Watery discharge from the eyes, cloudy eyes and frequent blinking.</li> <li>• Swollen lymph nodes.</li> <li>• Intermittent fever over several weeks.</li> <li>• Paleness of gums, under the tongue and inner surface of the eyelid.</li> <li>• In camels, mild cases may recover slowly, but in severe cases the hump becomes smaller and hair falls out, especially from the tail. Animals become very sick and collapse, leading to death within two weeks.</li> <li>• Pigs in severe cases breathe very fast, stop eating, have a high fever, and collapse and die in one or two days.</li> </ul>	<ul style="list-style-type: none"> <li>• Boil 0.5 kg of stem bark of <i>Warburgia ugandensis</i> in 1 l of water. Strain and drench with the warm liquid once a day for 2 to 3 days, using 1 l of drench for camels, cattle and donkeys, 0.5 l for other animals. (Treatment for camels, cattle, goats, pigs, sheep and donkeys.)</li> <li>• Boil 0.5 kg of <i>Salvadora persica</i> bark in 1 l of water. Drench with the warm liquid, using 1 l of drench for camels, cattle and donkeys, 0.5 l for other animals. (Treatment for camels, cattle, goats, pigs, sheep and donkeys.)</li> <li>• Take 1 kg of fresh roots and bark of <i>Acacia reficiens</i>, crush and soak overnight in 5 l of water. Sieve and drench with about 3 l of the mixture. (Treatment for camels.)</li> </ul>


**Source:** Dharani N, Yenesew A, Aynekulu E, Tui B, Jamnadass R (2015) Traditional ethnoveterinary medicine in East Africa: a manual on the use of medicinal plants. Dawson IK ed. The World Agroforestry Centre (ICRAF), Nairobi, Kenya.

### 2.5.3 Remedies for foot and mouth disease

Parasite name	Image	Signs	Treatment
Foot and mouth disease		<ul style="list-style-type: none"> <li>• Blister-like sores and ulcers on the udder, teats, feet, inside the mouth, on the nose muzzle and on the tongue. When blistering around the hoof is very bad the hoof may fall off.</li> <li>• Lameness. Usually, all four feet are painful.</li> <li>• Loss of appetite, high fever and weakness.</li> <li>• Drooling and smacking of the lips.</li> <li>• Rough, dull coat.</li> <li>• Reduction in milk production.</li> <li>• Pregnant animals often abort.</li> </ul>	<ul style="list-style-type: none"> <li>• Mix 0.5 kg of Magadi soda with 5 l of water. Drench animals with this solution. Use 5 l for cattle and camels, 2.5 l for calves, sheep and goats. Repeat twice a day until the animal recovers. (Treatment for camels, cattle, sheep and goats.)</li> <li>• Pound 0.25 kg of fresh roots and 0.25 kg of fresh leaves of <i>Vernonia amygdalina</i> and mix with 4 kg of finger millet flour in 5 l of water. Sieve and drench animals with the liquid. Use 2 l for cattle and camels, 1 l for calves, sheep and goats. Repeat twice a day until the animal recovers. (Treatment for camels, cattle, sheep and goats.)</li> <li>• Grind 0.5 kg of dry <i>Acalypha fruticosa</i> leaves into a powder. Apply a teaspoonful to each foot wound. Repeat every 2 days until the animal recovers. (Treatment for all animals.)</li> <li>• Pound a handful of fresh leaves of <i>Vernonia amygdalina</i> and mix with 0.5 l of ghee. Apply the paste to the animal's blisters/sores/ulcers twice a day until they heal. (Treatment for donkeys, cattle, sheep and goats.)</li> <li>• Extract the juice of crushed leaves and fruit of <i>Solanum incanum</i> and apply directly to foot sores. (Treatment for all animals.)</li> <li>• Crush 0.5 kg of fresh root of <i>Acacia tortilis</i> with 0.3 kg of fresh bark of <i>Acacia oerfota</i>. Boil in 1 l of water for 10 to 15 minutes. Drench the sick animal morning and evening with 0.5 l of the liquid for 3 days (Treatment for sheep and goats.)</li> <li>• CAUTION: The disease is easily transmitted from animal to animal by humans. Wear hand protection (plastic bags over the hands or surgical gloves) when applying treatments. Wash hands thoroughly with soap and water afterwards.</li> </ul>

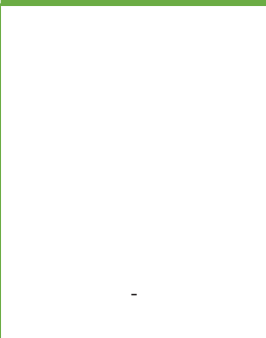
**Source:** Dharani N, Yenesew A, Aynekulu E, Tui B, Jamnadass R (2015) Traditional ethnoveterinary medicine in East Africa: a manual on the use of medicinal plants. Dawson IK ed. The World Agroforestry Centre (ICRAF), Nairobi, Kenya.

## 2.5.4 Remedies for anthrax disease

Parasite name	Image	Signs	Treatment
Anthrax		<ul style="list-style-type: none"> <li>• Very high fever and blood in the urine, faeces or milk.</li> <li>• Difficulty breathing.</li> <li>• Collapse and death after 1 to 3 days.</li> <li>• Cattle have swelling under the jaw, sometimes under the neck and of the abdomen.</li> <li>• In dead animals, dark blood sometimes comes from the nose, mouth, ears, anus and vagina; the dead animal's blood does not clot.</li> <li>• The carcass is bloated and normally becomes rigid 1 to 12 hours after death.</li> </ul>	<ul style="list-style-type: none"> <li>• Animals often die too quickly for treatment to be administered. However, when some animals within a group die of anthrax, watch the others carefully for 1 to 2 weeks and treat immediately any that develop fever.</li> <li>• Pound 0.5 kg of fresh roots and 0.5 kg of fresh leaves of <i>Salvadora persica</i> and boil for 30 minutes in 8 l of water. Present as drinking water until the animal recovers. (Treatment for all animals.)</li> <li>• Crush 0.25 kg of fresh fruit of <i>Grewia villosa</i> and boil in 1 l of water for 15 minutes. Pour the warm solution over the affected animal once every morning for 4 days. (Treatment for all animals.)</li> <li>• Take the warm powdered ash of <i>Balanites aegyptiaca</i> wood and rub on the body of the sick animal. Repeat daily for 3 days. (Treatment for cattle, camels, sheep and goats.)</li> <li>• CAUTION: To prevent human infection and animal cross-infection, wear hand protection (plastic bags over the hands or surgical gloves) when applying treatments. Wash hands thoroughly with soap and water afterwards.</li> </ul>

**Source:** Dharani N, Yenesew A, Aynekulu E, Tuei B, Jamnadass R (2015) Traditional ethnoveterinary medicine in East Africa: a manual on the use of medicinal plants. Dawson IK ed. The World Agroforestry Centre (ICRAF), Nairobi, Kenya.

## 2.5.5 Remedies for foot rot disease

Parasite name	Image	Signs	Treatment
Foot rot		<ul style="list-style-type: none"> <li>• Swollen foot just above the hoof.</li> <li>• Sudden lameness in a foot or feet.</li> <li>• Whitish, rotting tissue and pus between the two parts of the hoof, which has a bad odour.</li> <li>• Loss of appetite due to pain, loss of weight and weakness.</li> <li>• Fever.</li> </ul>	<ul style="list-style-type: none"> <li>• Before applying any treatment, wash the foot with hot water, especially the skin between the claws of the hoof, and gently trim away any decayed part of the hoof to remove/expose infection.</li> <li>• Pound a handful of fresh <i>Vernonia amygdalina</i> leaves and mix with half a cup of ghee or animal fat. Apply this paste between the claws of the affected hoof twice a day until it heals. (Treatment for cattle, sheep and goats.)</li> <li>• Grind 0.5 kg of dry leaves of <i>Acalypha fruticosa</i> into a powder. Put 1 teaspoonful of the powder directly on to the wound. Repeat on alternate days until the animal recovers. (Treatment for all animals.)</li> <li>• Wash the affected foot with warm salty water twice a day until the animal recovers. (Treatment for all animals.)</li> <li>• Apply used engine oil or brake fluid twice a day for 1 week. (Treatment for all animals.)</li> </ul>

**Source:** Dharani N, Yenesew A, Aynekulu E, Tuei B, Jamnadass R (2015) Traditional ethnoveterinary medicine in East Africa: a manual on the use of medicinal plants. Dawson IK ed. The World Agroforestry Centre (ICRAF), Nairobi, Kenya.

## 2.5.6 Remedies for injuries, simple operations and emergencies

Parasite name	Image	Signs	Treatment
Wounds		<ul style="list-style-type: none"> <li>Bleeding and pus.</li> <li>Dirt collects around the affected area.</li> <li>Red and swollen skin.</li> <li>Pale mucous membrane if significant bleeding.</li> </ul>	<ul style="list-style-type: none"> <li>Before applying the below treatments, for fresh wounds first stop bleeding by pressing a clean, wet cloth over the wound. Then wash the wound with clean water containing a pinch of salt, and clip hair or wool away from the edges of the wound. For older wounds that have not properly healed, cut away scab material from around the wound.</li> <li>Take 0.25 kg of crushed <i>Ricinus communis</i> seed and heat to extract the oil. The dry leaves of <i>Ricinus communis</i> can also be used after being crushed into a powder. Apply the oil or leaf powder to the wound, repeat daily until it heals. (Treatment for all animals.)</li> <li>Dry a piece of <i>Adenium obesum</i> bark and crush into a powder. Apply the powder to the wound and cover with a piece of cloth until it has healed. (Treatment for all animals.) CAUTION: <i>Adenium obesum</i> is very poisonous and should be handled with care. Wear plastic bags over the hands or surgical gloves when handling and applying. Keep out of reach of children and prevent animals from licking the treated area.</li> <li>Crush a leaf of <i>Aloe secundiflora</i> and apply the pulp to the wound. Repeat the treatment daily until the wound has healed. (Treatment for cattle, donkeys, sheep, goats and dogs.)</li> <li>Take fresh sap from <i>Euphorbia candelabrum</i> and apply directly to the wound. Repeat daily until the wound heals (Treatment for cattle, donkeys, sheep and goats.)</li> <li>Take a handful of fresh bark of <i>Elaeodendron buchananii</i> and soak in water for 1 to 2 hours. Apply the liquid to the wound once a day until it heals. (Treatment for all animals.) CAUTION: <i>Elaeodendron buchananii</i> is very poisonous and should be handled with care. Wear plastic bags over the hands or surgical gloves when handling and applying. Keep out of reach of children.</li> <li>Crush a handful of bark of <i>Acacia etbaica</i> or <i>Acacia bussei</i> and mix with 1 l of water. Leave for 1 to 2 hours. Drop the liquid onto the wound and repeat daily until it heals. (Treatment for all animals.)</li> <li>Crush <i>Bulbine abyssinica</i> leaves and apply the juice and pulp to the wound. Repeat 2 or 3 times a day until the wound heals. (Treatment for cattle, sheep and goats.)</li> <li>Pound a handful of dry <i>Myrsine africana</i> seed into a powder. Apply the powder directly to the wound. Alternatively, mix 0.25 kg of the powdered seed with half a cup of sheep fat. Boil and then allow to cool. Pour the mixture onto the wound before the fat sets. Repeat either treatment daily until the wound heals. (Treatment for camels, cattle, sheep and goats.)</li> <li>Crush very young branches of <i>Croton megalocarpus</i> or <i>Croton macrostachyus</i> and collect the sap. Apply the sap to the wound. Repeat once a day until the wound heals. (Treatment for cattle and goats.)</li> <li>Take a handful of gum from <i>Commiphora erythraea</i> or <i>Commiphora myrrha</i> and a handful of <i>Acacia senegal</i> gum. Add 0.25 l of water to the gum and make a paste. Apply to the wound. <i>Acacia senegal</i> gum helps dry the wound and <i>Commiphora</i> gum controls bleeding, repels flies and assists healing. (Treatment for camels, cattle, sheep and goats.)</li> </ul>
Abscess (a collection of pus at a localized site anywhere on the skin or within an animal's body)	-	<ul style="list-style-type: none"> <li>Abscesses often start as hard, hot swellings, which later become painful and gather pus.</li> <li>Abscesses burst open and release the pus.</li> <li>Hair is lost around burst abscesses.</li> </ul>	<p>To ripen abscesses:</p> <ul style="list-style-type: none"> <li>Take 4 leaves of <i>Datura stramonium</i>, crush 2 of them and heat the other 2 over a fire. Apply the crushed leaves to the swelling and place the heated leaves on top. Tie on with a bandage. Repeat 2 to 3 times a day until the swelling ripens. Then squeeze the abscess gently to burst it (or pierce the skin over the abscess with a sharp knife) and release the pus. Clean the wound and again apply crushed <i>Datura stramonium</i> leaf. (Treatment for all animals.)</li> </ul>



Parasite name	Image	Signs	Treatment
			<ul style="list-style-type: none"> <li>• Pound a handful of leaves of <i>Harrisonia abyssinica</i> and mix with 0.25 kg of warm ghee or animal fat. Apply directly to the abscess twice a day until it ripens. Then squeeze the abscess gently to burst it and release the pus. Apply a bandage to prevent the animal licking the site during and after treatment. (Treatment for all animals.)</li> <li>• Take fresh cow dung and make into round or oval shaped cakes or patties that fit in the palm of the hand. Heat over a fire and place on the abscess. Repeat once a day until the abscess ripens. Then squeeze the abscess gently to burst it and release the pus. (Treatment for cattle, sheep and goats.)</li> <li>• Heat a hard, iron object and apply when hot to the abscess until the hair is burnt off. Make a small cut and press out the pus. (Treatment for all animals.)</li> </ul> <p>Treating the wounds caused by abscesses:</p> <ul style="list-style-type: none"> <li>• Take a handful of <i>Commiphora erythraea</i> gum, add 50 ml of water and heat until the mixture boils. Cool and apply warm to the abscess wound. Apply once only. (Treatment for all animals.)</li> <li>• Wash the wound with warm salt water. Pound a handful of fresh <i>Azadirachta indica</i> leaves and apply. (Treatment for all animals.)</li> <li>• CAUTION: To prevent cross-infection, wash hands, and any equipment (e.g., knives) used to treat the abscess, thoroughly with soap and water afterwards.</li> </ul>
Poisoning		<ul style="list-style-type: none"> <li>• Abscesses often start as hard, hot swellings, which later become painful and gather pus.</li> <li>• Abscesses burst open and release the pus.</li> <li>• Hair is lost around burst abscesses.</li> <li>• Bloated stomach, abdominal pain and kicking of the abdomen.</li> <li>• Groaning, bleating.</li> <li>• Foaming at the mouth, drooling and vomiting.</li> <li>• Excitement, depression.</li> <li>• Lack of co-ordination, jumping, unusual movements, stiffness and weakness.</li> <li>• Fits, shivers, convulsions.</li> <li>• Difficulty in breathing.</li> <li>• Excessive sweating.</li> <li>• Uncontrolled urination and severe diarrhoea with blood.</li> <li>• Paralysis, loss of consciousness and death.</li> </ul>	<ul style="list-style-type: none"> <li>• Mix 1 kg of ground charcoal with 2 l of fresh milk and 2 l of water. Drench cattle with 4 l of the mixture, calves, sheep and goats with 2 l. Drench once daily until the animal recovers. (Treatment for cattle, sheep and goats.)</li> <li>• Drench cattle with 6 l of milk, use 2 l for calves, sheep and goats. (Treatment for cattle, sheep and goats.)</li> <li>• If a dog has been poisoned, pour 10 ml of concentrated salt solution into the back of its throat to cause vomiting.</li> <li>• If an animal's skin has been exposed to poison, thoroughly wash it with soap and water.</li> </ul>

Parasite name	Image	Signs	Treatment
Snake bite		<ul style="list-style-type: none"> <li>Restlessness, lack of co-ordination and stop feeding.</li> <li>Sweating, swelling at the site of the bite, bleeding from the bite in some cases.</li> <li>Foaming at the mouth, protruded tongue and difficulty breathing.</li> <li>Death if bitten by a highly venomous snake.</li> </ul>	<ul style="list-style-type: none"> <li>Immediately after an animal has been bitten, tie a tight bandage above the bite, cut the bite open so that it bleeds and press out as much blood as possible. Crush together fresh roots of <i>Gardenia ternifolia</i> var. <i>jovis-tonantis</i> and fresh roots of <i>Steganotaenia araliacea</i> in equal proportions and apply the juicy paste once to the bite. (Treatment for camels, cattle, donkeys, dogs, sheep and goats.)</li> <li>For the treatment of snake spit in the eyes of animals, crush 0.2 kg of fresh roots of <i>Gardenia ternifolia</i> var. <i>jovis-tonantis</i> and 0.2 kg of fresh bark and stems of <i>Steganotaenia araliacea</i> and add 0.25 l of water. Sieve and wash the animal's eyes with the liquid. Alternatively, apply the crushed paste to the eyes and cover with a bandage. Repeat daily until the eyes have healed. (Treatment for all animals.)</li> </ul>

Source: Dharani N, Yenesew A, Aynekulu E, Tuel B, Jamnadass R (2015) *Traditional ethnoveterinary medicine in East Africa: a manual on the use of medicinal plants*. Dawson IK ed. The World Agroforestry Centre (ICRAF), Nairobi, Kenya.

## 2.6 Other Traditional practices for external or ectoparasite management and control

Species	Parts used	Preparation	Target organisms
<i>Solanum incanum</i> (English): Sodom apple	Ripe fruits	<ul style="list-style-type: none"> <li>Whole dry, ripe fruits are crushed and extracted in water at 5%</li> <li>w/v for 24 h and sprayed at 5L/ animal</li> </ul>	Against cattle ticks
<i>Ocimum kilimandscharicum</i> (English): Sacred Basil, Holy Basi	Leaves, flower	Smashing, sweeping with twigs, planted near the house, burning	Mosquito, fleas
<i>Psidium punctulata</i> (Maasai): Olaboi	Leaves	Infusion	Lice, fleas, mites
<i>Commiphora holtiziana</i> (English): commiphora (Somali): Haggar	Bark resin	Mixed with milk, boiled and smeared	Ticks, skin diseases

Source: Anjarwalla P, Belmain S, Sola P, Jamnadass R, Stevenson PC. 2016. Handbook on Pesticidal Plants. World Agroforestry Centre (ICRAF), Nairobi, Kenya.

## 2.7 Other Farmer practices/solutions for deworming poultry

Solution/practice	Purpose	Preparation and how to use
Moringa extract	Deworming	Crash moringa leaves, drench with water and extract the liquid. Add to drinking water for poultry.
Aloe vera	Deworming	Crash pieces of aloe vera leaves, soak in 1 litre of water. Leave for 30 minutes. Strain off the liquid. Add to drinking water for poultry for 3 days.
Chili	Deworming	Crush 2 handfuls of chili seeds or crush together 4 or 5 red fruits of capsicum, soak in 2 litres of water for 4 to 6 hours. Present the liquid as drinking water to birds for 3 days. If birds refuse to drink, drench adult birds with 2 tablespoons twice a day until they recover. For young birds, drench with 1 tablespoonful twice a day. Alternatively, crush hot chili and leave for birds to eat for 2-3 days.
Chili + Aloe vera + <i>Amaranth hybridus</i>	Deworming	Crush together 4-5 fruits of chili, 1 or 2 leaves of aloe vera and a handful of <i>Amaranthus</i> leaves. Soak in 2 litres of water for 6 hours. Drench each bird with 2 tablespoonfuls twice a day until recovery. Also leave the mixture for birds to drink.
Neem	Deworming	Chop and pound 0.5kg of fresh bark of neem. Take the extracted juice and mix with regular drinking water.
<i>Croton Megalocarpus</i>	Deworming	Chop 0.5kg of fresh young leaves of croton and soak in 2 litres of water. Leave for 3 to 5 minutes until the liquid turns green. Give the liquid to chicks as their drinking water for up to 3 days

Source: Grow Biointensive Agriculture Center of Kenya (GBIACK), Email: [gbiackcentre.org@gmail.com](mailto:gbiackcentre.org@gmail.com), Phone: 0712469566

# 3

## RESOURCES FOR FURTHER INFORMATION ON ALTERNATIVE INPUTS AND FARMER PRACTICES

1. Effective IPM Association [www.e-ipma.org](http://www.e-ipma.org)
2. Grow Biointensive Agriculture Center of Kenya (GBIACK), <https://g-black.org/>, Email: [gbiack-centre.org@gmail.com](mailto:gbiack-centre.org@gmail.com), Phone: +254 712 469 566.
3. COSDEP Kenya, <https://coskenya.com/>, Email: [info@cosdepkenya.org](mailto:info@cosdepkenya.org), Phone: +254 722 460 769
4. CSHEP <https://cshepkenya.org/>, Email: [info@cshepkenya.org](mailto:info@cshepkenya.org), Phone: +254 727 977 009.
5. Root to Food Alliance <https://routetofood.org/>, The Farmers' Resource Guide: Achieving Food Production without Toxic Pesticide 2024.
6. Vihiga Nutrition and Community Seed Bank Community Cased Organization, Phone +254 720 423 553.
7. Biovision Infonet <https://www.infonet-biovision.org/>
8. Anjarwalla P, Belmain S, Sola P, Jamnadass R, Stevenson PC. 2016. Handbook on Pesticidal Plants. World Agroforestry Centre (ICRAF), Nairobi, Kenya.
9. Dharani N, Yenesew A, Aynekulu E, Tuei B, Jamnadass R (2015) Traditional ethnoveterinary medicine in East Africa: a manual on the use of medicinal plants. Dawson IK ed. The World Agroforestry Centre (ICRAF), Nairobi, Kenya.
10. Agroforestree Database <https://www.worldagroforestry.org/resources/databases/agrofore-stree>.
11. Tree Seed Suppliers Directory <https://www.worldagroforestry.org/our%20products/databases/tssd>.
12. KOAN'S [www.saferinputs.koan.co.ke](http://www.saferinputs.koan.co.ke)





