













Pests	Pest Damage	Solutions	Diseases
 Diamondback moth		<p><b>Repellents:</b> African marigold, black jack, tephrosia, garlic, crotalaria, chilli and peppers, eucalyptus, tomato.</p> <p><b>Insecticides:</b> African marigold, black jack, tephrosia, lantana, garlic, tea, papaya, pyrethrum, crotalaria.</p> <p><b>Antibacterial:</b> African marigold, garlic, tea, tomato.</p> <p><b>Antifungal:</b> African marigold, garlic, papaya, crotalaria, tithonia, sweet potato, tomato, oleander, rhubarb.</p> <p><b>Nematicide:</b> Cassava, oleander, garlic, papaya.</p>	 Maize smut
 Stemborer			 Maize Streak virus
 Cutworm			 Mosaic virus
 Aphids			 Late blight

## Herbal cures safer than chemicals

All African farmers know about the damaging effects of insect pests. These are responsible for 20–30 percent of the crop being destroyed. And all African farmers know that modern chemical pesticides are not only poisonous and harmful to human health but they destroy the environment. In most cases, chemical insecticides do not solve the problem.

There are many safe, natural and simple methods of protecting plants. On the following pages we give you some useful advice for environmentally safe alternatives to replace agro-chemicals.

But this is not enough. Farmers should observe nature closely, then they will find the answers. First, they should reinstate the fertility of the soil; healthy plants are more resistant against pests. Second, they should provide habi-

tats for predators; while the insect pests live directly on the plants, the predators which prey on these pests live in hedges and trees and do their work during day time. That means farmers should never spray during day-time, but early in the morning or late in the afternoon, when the predators have gone back to their habitats. Thirdly, farmers should re-introduce plant diversity into cropping. This is the best way to maintain the pest/predator balance.

Every farmer should be an observer and examine carefully what is going on in their shambas. Every farmer also has to be a researcher: They have to know which method can be used to restore the natural balance that restores the natural balance. Plant extracts are slow in acting, they do not work like chemicals; this means that farmers have to use them several times a week to produce good results.

### Hedges are natural barriers

Plants can act as a physical barrier to the movement of pests. Hedges hinder the movement of aphids into the garden. A hedge of Tithonia, for instance, is a natural barrier against many insects. A row of pigeon peas (*mbaazi*, also called Congo peas) has been used to protect tomato, potato and cabbage crops against red spider mites. Beans have been planted as decoys in rows around cabbages to protect this vegetable from spider mites. Beans are an ideal decoy for it serves four functions: insect control (decoy), improvement of the soil (legume), food for livestock, material for mulching or compost. Hedges are also habitats for many predators. Here agro-forestry can play an important role.







Tithonia

Pigeon peas

Beans





<p><b>African marigold / Mbangimwitu (<i>Tagetes erecta</i>)</b>  <b>Inazuia:</b> Bacteria, fungi, nematodes,  <b>Wadudu:</b> Ants, beetles and many other insects.  <b>Kutayarisha:</b>  1. Ponda gramu 100-200 ya matawi, mizizi na maua; mwaga kwa lita moja ya maji yaliyochemka; lowa kwa masaa ishirini na nne; ongeza lita moja ya maji baridi, nyunyiza kwa mimea au mchanga.  2. Panda mimea tofauti kila wakati ili kuzuia hawa wadudu.</p>	
<p><b>Blackjack / Kishonanguo (<i>Bidens pilosa</i>)</b>  <b>Inazuia:</b> Insects  <b>Wadudu:</b> Repels aphids, ants, beetles, cabbage root fly, caterpillars, crickets, mites, termites and whitefly.  <b>Kutayarisha:</b>  1. Funika kikombe kilichojaa mbegu ambazo zimekomaa na maji; chemsha kwa dakika kumi au lowa majini kwa masaa ishirini na manne, kisha upoeshe. Ongeza lita moja ya maji na kijiko kimoja kidogo cha sabuni; halafu unyunyizie mimea.  2. Mbegu zinaweza kutawanyishwa karibu na vichaka kuvutia mchwa. Mmea waweza kupondwa au kusuguliwa kisha maji yake yatumiwe kunyunyizia mimea.  <b>Maelezo zaidi:</b> Kiasi kingi cha dawa hii chaweza kuyadhuru baadhi ya maua ya mimea.</p>	
<p><b>Cassava / Muhogo (<i>Manihot esculenta</i>)</b>  <b>Inazuia:</b> Nematodes and aphids.  <b>Kutayarisha:</b>  1. Toa maji ya matunda kwa kuponda mizizi; pima kiwango kimoja cha maji ya matunda sawa na maji ya kawaida (1:1). Nyunyiza haraka ukitumia lita nne kwa mita moja mraba, inasemekana kuwa na athari kubwa. Ngoja siku ishirini kabla kupanda.  2. Tumia maganda ya mihogo kuzuia nematodes.  <b>Maelezo zaidi:</b> Mizizi ya muhogo iliyo chungu ina sumu, kwa hivyo lazima iondolewe kabla kuliwa.</p>	
<p><b>Castor oil plant / Mbariki, Mbono (<i>Ricinus communis</i>)</b>  <b>Inazuia:</b> Panya, fuko na mchwa pamoja na magonjwa ya Ukungu (fungi)  <b>Kutayarisha:</b>  1. Kama kinyunyizo cha kawaida lowa mbegu ya kijani kibichi na matawi kwa maji masaa ishirini na nne; chuchunga na unyunyize.  2. Kausha mbegu za kijani kibichi na matawi na usage kuwa hali ya unga.  3. Kwa sota (cutworms), weka vikombe vinne vya maganda ya mbegu iliyoondwa kwa lita mbili ya maji; chemsha kwa dakika kumi. Ongeza sabuni kiasi, changanya maji kufikia lita kumi kisha unyunyizie haraka kwenye mchanga.  4. Weka mbegu za kijani kibichi kwa shimo ya fuko au njia za panya kuwa kama vizuizi.  5. Lima mbegu, matawi au oil cake, kwa mchanga ili izuie magonjwa ya ukungu (fungal diseases)  6. Majani yanayotiwa shinani mwa mimea ili kuhifadhi unyevunyevu hufukuza mchwa:  <b>Maelezo zaidi:</b> Matawi yenye shina nyekundu yana matokeo mazuri kuliko yale yenye shina ya kijani kibichi.</p>	
<p><b>Chilli and Sweet pepper / Pilipili kichaa, pilipili hoho (<i>Capsicum frutescens</i>)</b>  <b>Inazuia:</b> Mchwa na wadudu wengine  <b>Kutayarisha:</b>  1. Nyunyizia kawaida; saga mikono miwili ya pilipili; lowa kwa maji lita moja siku nzima. Tingiza vizuri kwa dakika chache, chuchunga; ongeza lita tano ya maji na sabuni kidogo.  2. Pilipili ya unga inaweza kupakwa kwa nguzo za mimea kuzuia ants, cutworms, slugs and snails na aina tofauti za wadudu mchangani.  3. Maji ya matunda kutokana na pilipili tamu, itazuia virusi vya mosaic na kukataza ueneaji wa virusi vinginevyo.  4. Pilipili hutumika sana kama kizuizi.  <b>Maelezo zaidi:</b> Inazuia virusi aina ya mosaic na kukinga virusi vinginevyo.</p>	
<p><b>Crotalaria / Marejea (<i>Crotalaria Juncea</i>)</b>  <b>Inazuia:</b> Huzuia magonjwa ya Ukungu (fungal diseases)  <b>Wadudu:</b> Huzuia wadudu aina nyingi.  <b>Kutayarisha:</b>  1. Panda mmea mahali na wakati tofauti ili kuwafukuza nematodes na wadudu wengine kutoka kwa mimea yako.  2. Weka sehemu ya mmea uliopoondwa ndani ya maji kuunda kinyunyizo  <b>Onyo:</b> Ni sumu kwa ngombe kwa kiasi cha chini. Usiweke mbegu kwenye chumba ambacho watu wanamoishi.</p>	

**Garlic / Kitunguu Saumu (*Allium sativum*)****Inazuia:** Bacteria pamoja na magonjwa ya ukungu.**Wadudu:** Ants, aphids, armyworms, caterpillars, moths, grubs, mice, mites and mosquitoes.**Kutayarisha:**

1. Kinyunyizo cha kawaida, ponda kitunguu saumu; ongeza kwa lita moja ya maji kisha changanya ndani ya sabuni kidogo, halafu uitumie haraka.
2. Kitunguu chenyewe chaweza kukaushwa, kupondwa na kutumiwa kama poda. Poda inaweza kugeuzwa kuwa kinyunyizo kinachopendekezwa kwa scab, mildew, bean rush na tomato blight.
3. Kitunguu saumu ambacho kimepandwa kuzunguka miti ya matunda na mimea mingine huzuia aphids, fruit tree borers, panya, fuko na mchwa.
4. Mchanganyiko ambao umeundwa kwa kufunika vipande vitatu vya saumu vilivyo-pondwa na kuwekwa ndani ya mtungi na nusu kikombe cha mafuta ya mboga; lowa na uongeze lita kumi ya maji ya sabuni yaliyo joto kadiri; inasemekana kuwa inatengeneza kinyunyizio kinachoweza kuwauwa wadudu wa aina nyingi.

**Maelezo zaidi:** Usitumie kwenye mimea ya jamii ya kunde, inadumu kwa muda wa mwezi mmoja, inaua wadudu wote.**Lantana / Mwingajini (*Lantana camara*)****Inazuia:** Aina nyingi ya wadudu**Kutayarisha:**

1. Ponda mkono mmoja wa majani kwa lita moja ya maji; ongeza sabuni kidogo, halafu nyunyiza.
2. Panguza ukitumia jivu, kausha na usage iwe poda. Choma utanzu na umwagilie jivu kwenye wadudu kama beetle na leaf miner.

**Onyo:** Mmea ni sumu kwa mifugo**Oleander (*Nerium indicum*)****Inazuia:** Fungi, nematodes, rice brown leaf spot**Wadudu:** Repels ants, flies, beetles, diamond back moth, rodents, and weevils**Kutayarisha:**

1. Kata na ulowe matawi, ngozi na maua kwa maji kwa dakika thelathini halafu nyunyiza
2. Kausha na usage sehemu ya mmea kuwa poda.

**Onyo:** Majani huwa na sumu kali**Papaya / Mpapai (*Carica papaya*)****Inazuia:** Fungi, nematodes, coffee rust, powdery mildew and rice brown leaf spot na wadudu aina kadha.**Kutayarisha:**

1. Nyunyizia kawaida, ongeza kilo moja ya majani yaliyokatakatwa kwa vipande vidogo vidogo kwa lita moja ya maji, tingiza kwa nguvu, ongeza lita nne za maji na uongeze sabuni kidogo (20g or ml) halafu nyunyiza kwa mchanga kuzuia cutworms.
2. Toa maji ya matunda kutoka kwa mbevu ambazo hazijakomaa kuzuia mchwa.

**Pyrethrum / Pareto (*Chrysanthemum cinerarifolium*)****Inazuia:** Aina yote ya wadudu.**Kutayarisha:**

1. Chuna maua siku ya joto, anika kwa kivuli; saga iwe unga, halafu umwagie wadudu.
2. Mwaga lita moja ya maji juu ya gramu hamsini ya unga wa pareto (au 20g poda); lowa masaa kadhaa; ongeza sabuni kidogo, chuchunga na kinyunyiza.

**Maelezo zaidi:** Nyunyizia jioni kabisa na uwe mwangalifu ili kuwalinda nyuki.**Rhubarb (*Rheum* spp.)****Inazuia:** Magonjwa aina ya Ukungu.**Wadudu:** Aina ya wadudu walio na miili nyororo kama aphids, whitefly, caterpillars.




1. Lowa gramu mia moja ya matawi mabichi kwa lita moja ya maji kwa masaa ishirini na nne; ongeza sabuni kidogo, halafu nyunyiza.
2. Kutoa nyunyizo lililo na nguvu zaidi, tumia hadi matawi tano.
3. Mmea wa rhubarb uliopandwa karibu na kabeji huzuia ugonjwa wa club root.

**Maelezo zaidi:** Majani ya mmea huu huliwa kama tunda.**Stinging nettle / Thabai****Inazuia:** Fungi**Kutayarisha:**

Chemsha kilo mbili za stinging nettle katika lita tano ya maji. Chuchunga na unyunyizie mimea. Mchanganyiko huu waweza kuzuia magonjwa ya ukungu kama mildew.










<p><b>Sweet Potato / Kiazi kitamu (<i>Ipomea batatas</i>)</b>  <b>Inazuia:</b> Rice brown leaf spot, rice blast and other fungi.  <b>Wadudu:</b> Aphids  <b>Kutayarisha:</b>            1. Ponda na ulowe majani kwa maji, nyunyiza            2. Maji yanayo wanga mzito baada ya kupika yanaweza kunyunyizwa kwa wadudu wadogo kama aphids.</p>	
<p><b>Tea / Chai (<i>Cammelia sinensis</i>)</b>  <b>Inazuia:</b> Magonjwa ya ukungu.  <b>Wadudu:</b> Woolly aphid, squash bug, konokono na mchwa.  <b>Kutayarisha:</b>            1. Matawi ambayo yametumika yaweza kutawanywa karibu na mimea kufukuza dudu makamasi (konokono).            2. Maji baridi yaweza kunyunyiziwa kwa mimea.            3. Matunda ambayo yamelowa kwa maji hutumiwa kufukuza mchwa.</p>	
<p><b>Tomato / Nyanya (<i>Lycopersicon esculentum</i>)</b>  <b>Inazuia:</b> Bacteria, fungi  <b>Wadudu:</b> Aphids, ants, asparagus beetle, cabbage, worms, diamondback moth, cockroaches, mites, nematodes, whitefly na magonjwa ya ukungu.  <b>Kutayarisha:</b>            1. Chemsha kwa moto kiasi kilo moja ya matawi yaliyokatakatwa kwa maji, nyunyiza.            2. Katakata mikono miwili ya matawi au matunda kwa lita mbili ya maji ndio maji ya matunda ya kijani kibichi ikongolewe. Wacha kwa masaa matano, chuchunga na uongeze sabuni kidogo; nyunyiza kila baada ya siku mbili wakati vipepeo na wadudu wa kabaji wanapo pepea. Ni vizuri kutumia majani mabichi iwapo yatatumiwa wakati huo huo.            3. Sehemu zilizokauka zaweza kupondwa kuwa poda na kuchanganywa na maji ili kupata kinyunyizo au kupakwa kama poda, lakini adhari yake haina nguvu kuliko sehemu ya mmea ambao haujakauka.            4. Nyanya ambazo zimepandwa kuzunguka mimea mingine hukinga mimea kutokana na asparagus beetles.            5. Mmea mzima unaoninginia kwa shamba la matunda au ndani ya nyumba hukinga miti ya matunda kutokana na wadudu wengi wa nyumba kama mende.  <b>Onyo: Matawi ni sumu kwa binadamu.</b></p>	

## Many insects are friends of the farmer

Su Kahumbu, well known to the readers of *The Organic Farmer*, calls beneficial insects "good guys" (see photos below). There are indeed a lot of insects that are of benefit to farmers; they feed on insects which damage crops.

Farmers should take care of these predators. A farmer who is interested in natural order and balance should create good living conditions for predators so that they can carry out their task of keeping all crop-eating insects in check.

<p><b>Ladybirds</b></p> <p>Ladybirds are really good biological control agents. Adult ladybirds will prey on greenfly and blackfly and especially on aphids.</p>		<p><b>Lacewing</b></p> <p>The green lacewing is widely used to control many different pests. The lacewing is always hungry; it is the most voracious and will eat nearly all pests.</p>		<p><b>Spider</b></p> <p>All spiders are predatory on insects. Their catching system varies, and not all spiders use webs as traps.</p>	
<p><b>Ladybird larvae</b></p> <p>Ladybird larvae feed mainly on aphids, but also on other bugs. While it is in the larval stage, one ladybird beetle can eat nearly 500 aphids.</p>		<p><b>Wasps</b></p> <p>Wasps are good biological control agents. Adult females lay eggs in other insects and the wasp larvae develop as parasites, killing the host.</p>		<p><b>Centipedes</b></p> <p>Centipedes are in general ground-based predators, feeding on slugs, slug eggs and soil-dwelling insects.</p>	