DILULU FOUNDATION

GROWING GREENER COMMUNITIES ACROSS AFRICA

GARDENING GUIDE

Vermicomposting: Composting with Worms

A complete guide to setting up and maintaining a worm composting system. Learn about worm species, bin design, feeding, harvesting worm castings, and troubleshooting common problems.

COMPOSTING | ALL LEVELS | ENGLISH | 16 PAGES | 28 AUGUST 2026

"Knowledge grows when it is shared."

Contents

Vermicomposting is the art of letting worms do the heavy lifting. Red wiggler worms eat kitchen scraps and bedding, and in return they produce vermicast — one of the richest natural fertilizers known to gardeners. For households across Africa with little outdoor space, vermicomposting turns everyday food waste into a free, continuous supply of soil food that improves plant health, water retention and harvest quality.

This guide walks you through everything you need to start and maintain a thriving worm bin: choosing your worms, building a home for them, feeding them well, harvesting their castings, and putting the finished product to work in your garden, on your balcony, or in a school or community project.

What Is Vermicomposting?

Vermicomposting is the controlled breakdown of organic matter by composting worms. Unlike a traditional compost pile, which relies mainly on heat-loving bacteria, a worm bin works at comfortable room temperatures. The worms eat microorganisms and decaying material, and their digestive process transforms it into stable, nutrient-dense castings.

How It Differs from Regular Composting

- **Speed:** worms can process their own body weight in food every day, so finished product is ready in 8–12 weeks.
- **Space:** a worm bin fits under a kitchen counter, on a balcony or in a classroom corner.
- **Temperature:** worm bins must stay between 15 °C and 30 °C, making them ideal for shaded urban homes.
- **Product:** vermicast is finer, more uniform and richer in plant-available nutrients than most compost.

Why Vermicompost Matters

Healthy soil is the foundation of food security. Vermicast improves soil structure, feeds beneficial microbes and slowly releases nutrients that plants can absorb when they need them. One kilogram of vermicast can dramatically improve a square metre of tired, depleted soil.

> *"Feed the soil, and the soil will feed the plant. A worm bin is the smallest farm you will ever own."*

Benefits at a Glance

- **For plants:** stronger roots, better germination, improved flowering and fruiting.
- **For soil:** better drainage in clay, better water-holding in sand, restored microbial life.
- **For households:** 30–50 % of kitchen waste diverted away from bins and landfills.
- **For communities:** free fertilizer, income from selling castings, and a powerful teaching tool.

Choosing Your Worms

Not all worms compost. Earthworms that dig deep in garden soil (like the common nightcrawler) will not survive in a bin. You need surface-dwelling, fast-breeding composting worms.

The Best Species

- **Red wigglers (Eisenia fetida):** the classic composting worm — tolerant, fast and easy to keep.
- **African nightcrawlers (Eudrilus eugeniae):** larger and hungrier, ideal for warmer climates.
- **Indian blues (Perionyx excavatus):** very active in tropical conditions, best kept with red wigglers.

Start with roughly 500 grams (about 500–1000 worms) for a typical household bin. Ask at local agricultural extension offices, gardening clubs or online farming networks for starter cultures — or collect red wigglers from an existing compost pile or manure heap.

Building a Worm Home

Worms need a dark, moist, ventilated container with bedding, food and protection from heat, flooding and pests. Almost any container works if you follow a few rules.

Choosing a Container

- **Plastic storage bin:** 40–60 litres, opaque (worms dislike light), with a tight lid. Drill 8–10 small drainage holes in the bottom and 10–15 air holes near the top edge.
- **Wooden crate:** breathes naturally and insulates well; line the base with plastic to protect the floor.
- **Stacking tray system:** purpose-built bins make harvesting easiest, but a simple single bin works perfectly well.

Place the bin on bricks above a shallow tray so excess liquid can drain and air can circulate underneath. Keep the bin out of direct sun and rain.

Preparing the Bedding

1. **Shred:** tear newspaper, cardboard or dry leaves into strips 3–5 cm wide.
2. **Moisten:** soak the strips and squeeze hard — bedding should feel like a wrung-out sponge.
3. **Fluff:** fill the bin three-quarters full, mixing in a handful of garden soil (provides grit for the worms' gizzards).
4. **Rest:** let the bedding settle for a day before adding worms and food.

Feeding Your Worms

Worms eat about half their body weight each day. A kilogram of worms can manage roughly 500 grams of kitchen scraps daily. Feed small amounts at first and increase as the population grows.

Foods Worms Love

- Fruit and vegetable peels, cores and trimmings
- Tea bags, coffee grounds and crushed eggshells
- Stale bread, plain rice and cooked pasta (in moderation)
- Shredded cardboard, paper towels and dry leaves

Foods to Avoid

- Meat, fish, dairy and oily foods (attract pests, cause smells)
- Citrus and onion in large amounts (too acidic)
- Spicy, salty or heavily processed foods
- Fresh manure from animals recently treated with deworming medicines

Chop scraps into small pieces — surface area speeds decomposition. Bury food under 5 cm of bedding, rotating the feeding spot each time to avoid hot spots and fruit flies.

Moisture, Temperature and Light

Worm bins thrive between 15 °C and 30 °C, with 70–80 % moisture. A bin that is too dry slows the worms; too wet becomes smelly and airless.

Quick Checks

- **Too wet:** add dry shredded cardboard and leave the lid slightly ajar.
- **Too dry:** mist with water (never pour) and bury wetter foods.

- **Too hot:** move to a shaded spot, or place a frozen bottle of water inside during heatwaves.
- **Too cold:** wrap the bin in blankets or hessian sacks at night.

Worms breathe through their skin and must stay damp, but they also need oxygen. If bedding becomes compacted, gently fluff it with your hands every couple of weeks.

Common Problems and Solutions

PROBLEM	LIKELY CAUSE	SOLUTION
Bad, rotten smell	Overfeeding or too wet	Stop feeding for a week, add dry bedding, mix in air
Fruit flies	Food exposed on surface	Always bury food under 5 cm of bedding
Worms escaping	Bin too wet, hot or acidic	Correct moisture and temperature, add crushed eggshells
Worms clumped in a ball	Too hot or too dry	Move to shade, mist bedding, add wet food
Food not disappearing	Overfeeding or pieces too large	Feed less, chop smaller, bury deeper

Harvesting Vermicast

After 8–12 weeks the bin fills with dark, crumbly castings that smell like forest soil. Harvesting separates worms from castings so both can keep working.

Three Simple Methods

1. **Light method:** dump the bin contents into a cone on a bright surface. Worms burrow down to escape light; scrape off the top layer of castings every few minutes until only worms remain.
2. **Side method:** push the finished material to one side of the bin and fill the other side with fresh bedding and food. Within two weeks most worms migrate, leaving the old side ready to harvest.
3. **Screen method:** sift castings through a 5 mm mesh over a tray. Worms and cocoons stay behind and return to the bin.

Return any worms, cocoons (small lemon-shaped eggs) and undigested bedding to a refreshed bin with new bedding.

Using Vermicompost in the Garden

Vermicast is gentle enough to use at every stage of plant life. A little goes a long way.

- **Seed raising mix:** blend one part castings with three parts soil or coco peat.
- **Planting holes:** add a handful per transplant to reduce shock and speed establishment.
- **Top dressing:** sprinkle a 1–2 cm layer around established plants each month.
- **Potting soil:** mix 10–20 % castings into potting mixes for container gardens.
- **Compost tea:** steep a cup of castings in 4 litres of water for 24 hours and use as a liquid feed.

Worm Tea — the Liquid Bonus

Moisture that drains from a worm bin carries soluble nutrients and beneficial microbes. Dilute it one part liquid to ten parts water and use it as a free liquid fertilizer within 24–48 hours of collection. If the liquid smells bad, it has gone anaerobic — discard it outdoors away from plants.

Vermicomposting in Schools and Communities

A classroom worm bin is one of the most powerful teaching tools available: it connects children to waste, soil and food cycles through daily, hands-on science. Community groups can use worm farming to process market waste, produce seedling fertilizer and generate small income from surplus castings.

- **Schools:** assign student "worm wardens" to feed, record and report each week.
- **Markets:** collect sorted fruit and vegetable waste in covered buckets for community bins.
- **Income:** 100 grams of castings packed in small bags sells well to urban gardeners.

Scaling Up

Once one bin is running smoothly, scaling is mostly multiplication: more bins, or bigger ones. Keep new bins separate until established — a failing bin should never endanger a healthy one. A well-managed 60-litre bin can process the vegetable waste of a family of six while producing 15–20 kg of castings per year.

Frequently Asked Questions

Do worm bins smell?

A healthy bin smells like damp forest soil. Bad odours mean overfeeding or poor drainage — both easy to fix by adding dry bedding and pausing feeding.

Can I keep worms indoors?

Yes — thousands of households do. With a tight lid, buried food and balanced moisture, a bin under the sink is clean, quiet and odour-free.

How fast do worms multiply?

Red wigglers can double their population every 60–90 days when conditions are right, hatching from cocoons the size of a match head.

What about ants, rats and cockroaches?

Prevent them by burying food, keeping the bin raised, and avoiding meat, dairy and oily scraps. A ring of water or grease under the bin legs stops crawling pests.

Glossary of Terms

- **Vermicast:** worm manure — the finished product of vermicomposting.
- **Cocoon:** the lemon-shaped egg capsule from which baby worms hatch.
- **Bedding:** the moist carbon material (paper, leaves) that forms the worms' habitat.
- **Leachate:** liquid draining from the bin, useful when diluted as a fertilizer.
- **Aerobic:** with oxygen — the condition a healthy bin must maintain.

Further Learning

Connect with local agricultural extension services, permaculture groups and school garden networks for region-specific advice. Vermicomposting is forgiving — begin small, observe your worms, and let the bin teach you as it grows.