

Vermiculture and Vermicomposting

Production of organic fertilizer through the action of earthworms

Different Earthworm Species used in Vermicomposting

1. Red Wiggler
2. Red Tiger
3. Red Worms
4. Blue Worms
5. African Nightcrawlers (*Eudrilus euginae*)

Characteristics of African Nightcrawles

- ❖ Hermaphrodites (male and female reproductive organs are present in each worm)
- ❖ Matures in 6 weeks
- ❖ Population doubles in about a month
- ❖ Temperature Requirement (25°C to 29°C under shade)

Steps in Vermicomposting

- A. Site Selection: select a site that is shaded and well-drained with available water supply.
 1. Small Scale Production: wooden boxes, earthen pots, styrofoam boxes, plastic basin or any similar materials
 2. Commercial Production: provision of working space for drying and bagging
- B. Materials
 1. Worms
 2. Worm bin
 3. Substrate: either of the following combinations:
 - ❖ manure + ipil-ipil or kakawate (2:1)
 - ❖ rice straw + manure (1:1)
 - ❖ grasses + chicken manure (3:1)
 - ❖ sawdust + ipil-ipil (3:1)
 - ❖ compost / rice straw + corn barn (1:1)
 - ❖ cardboard and paper pulp

C. Stages in Vermicomposting

1. Anaerobic Stage

Cut the materials for use as substrate into smaller pieces by chopping with a bolo or cutting with a scissor. For large-scale production, using a powered shredded/chipper will shorten the time in the preparation of substrates. Finer materials could easily decompose (partial decomposition). If using different kinds of materials, mix the chopped raw materials before putting them in the decomposition chamber. Moisten the materials and cover the composting bin to initiate anaerobic decomposition. It takes 10 to 15 days to complete anaerobic decomposition and only then that they are ready for worm consumption.

2. Aerobic Stage

After the anaerobic decomposition, introduce the earthworms into the substrate. Aerobic decomposition lasts for 40 to 60 days depending on the materials used and the ratio of the worms to the substrate. Five kilograms of substrate is enough to feed a kilogram of worm for a month. Within the period, moisten (not soggy) the substrate regularly to provide the right moisture (60 to 80%) for the earthworm to grow and multiply.

3. Harvesting

Harvesting will commence 28 to 35 days or 4 to 5 weeks after stocking of worms. Prior to harvest, refrain from watering the substrate for 1 week to ease the separation of castings from worms and likewise preventing the castings to become compact. Then segregate the breeder worms from juvenile/baby worms by placing them in different containers or bins

Advantages of Vermicomposting

1. Environment friendly: since earthworms feed on anything that is biodegradable, vermicomposting then partially aids in the garbage disposal problems.
2. No imported inputs required: worms are now locally available and the materials for feeding are abundant in the locality as market wastes, grasses, used papers and farm wastes.
3. Labor extensive (mechanization possible)
4. Highly profitable: both the worms and castings are saleable

Benefits of Vermicompost / Castings on the Soil

1. Increase moisture and nutrient retention of the soil
2. Improves aeration and root penetration
3. Reduces crusting of soil surface
4. Micronutrients are added
5. Increases the number of beneficial soil microorganisms

The composition of casting using different substrates as feed to earthworms

(African Night Crawlers)

Sample	Moisture (%)	N (%)	P ₂ O ₅ (%)	K ₂ O (%)	Ca (%)	Mg (%)	Fe (%)	Mn (%)	O.M (%)
Horse manure	10.2	1.77	3.16	0.44	0.44	0.92	1.00	0.01	39.7
Market wastes	16.1	1.16	0.87	0.27	0.54	1.39	1.61	0.01	25.3
Rice straw	4.37	0.70	0.49	0.92	0.42	0.70	3.65	0.11	12.9
75% sawdust + 25% kakawate	23.9	0.59	N.D.	0.39	1.52	1.38	0.11	N.D.	-
Paper substrate	17.4	0.76	N.D.	0.12	1.22	N.D.	0.14	0.11	-

Source: <http://www.bpi.da.gov.ph/Services/vv.htm>