

INTRODUCTION

Worm farming is divided into two main areas of commercial activity:

1. production of earthworms for the fishing and composting industry (vermiculture) and,
2. actual composting of green wastes using worms (vermicomposting).

Both processes are very similar, the main difference is in the quality of feed given to the worms. In the UK, breeding and composting are usually done outdoors in "worm beds". Vermicomposting is the use of selected earthworm species to assist in the decomposition of organic wastes into compost. It is the result of joint action between earthworms and aerobic micro-organisms. Vermicomposting differs from conventional composting in several ways:

Conventional composting	Vermicomposting
<ul style="list-style-type: none"> • Waste is treated as one large decomposing mass • High temperatures are required (>60°C) • Needs turning to maintain aerobic conditions • Regulated by waste management legislation 	<ul style="list-style-type: none"> • Waste is applied in frequently in thin layers • Low temperatures need to be maintained (<30°C) • Aeration is done by the natural burrowing action of the worms • Legislative position is unclear at present (contact EA)

In several scientific experiments it has been shown that vermicompost increases certain aspects of plant performance e.g. increased vegetable yield and flower production. This is known to occur at certain concentrations of vermicompost substitution, typically 20 – 40% vermicompost, and although plants may be grown in 100% vermicompost they are often of poor quality.

SPECIES

Worm breeders in the UK concentrate on the earthworm *Dendrobaena veneta* since it can be used by both the fishing and composting market. *D. veneta* is naturally present in decomposing litter and manures but it is by no means the only "breedable" worm. Vermicomposters in the USA commonly breed and use *Eisina foetida* for waste management. However the markets in the UK are geared toward selling *D. veneta*.

EARTHWORM REQUIREMENTS

Setting up a worm bed is relatively easy. The initial bedding material should be a good quality sphagnum peat or the worms' original bedding material. In the beginning feed and / or compost should be introduced slowly, it will take about 14 days for the worms to become accustomed to new beds / feeding material. After this their maintenance should be straightforward. The bedding material and feed should always be kept moist, low in ammonia and at a neutral pH (5.5 – 7.5 is optimum). Most breeders and vermicomposters cover worm beds with a plastic sheet to encourage the worms to access the upper layers of the feed / waste. The cover also helps maintain a constant temperature.



Alwyn Phillips, Penygelli Farm

Fig 1: Worm beds on a north Wales farm

PRODUCTS

The products of worm farming are: worms; compost and compost derived products such as compost “tea” and mixtures of vermicompost / peat based compost.

HUSBANDRY AND HEALTH

Diseases are rare, however, like all animals worms benefit from regular management. Problems usually arise if the basic chemical and physical properties of the bedding become unfavourable. Signs of ill health would typically be: diminishing stock, visible dead worms and a rotting smell. When feeding cereals, be careful of rat infestation.

HARVESTING

In the active growing season it is possible to harvest breeding worms for fattening every week. After removal from outdoor beds, the worms are kept indoors at about 20°C and fed a high nutrient feed in order to increase body weight before selling on. Harvesting of worms has traditionally been done by hand, however some farmers have developed automated methods for separating worms from the bedding. It usually takes up to a year before the initial worm seed crop reproduces sufficiently to produce a harvestable crop.

The harvesting of worm bedding / compost is usually done when worm beds are full. This may take many months, often years, depending on size of the bed, feeding rate and earthworm numbers.

OUTLETS

Worms are sold as bait for the fishing industry and for composting organic wastes. Compost and compost derived products resulting from vermiculture may be sold to gardeners and horticulturalists. However, composts resulting from waste treatment may not be sold without a licence; however the compost may be used on site in unlicensed premises. Waste management legislation is constantly changing at present and each individual producer will need clarification on his / her particular circumstances before proceeding.

LEGISLATION

Worm breeders are not required to be licensed but are governed by usual agricultural regulations. However, anyone considering using worms to compost waste should contact the Environment Agency (EA). Waste treatment might require a Waste Management License although composting very small amounts is exempted but this also needs to be approved by the EA.

SETUP COSTS AND RETURNS

The primary cost in worm breeding lies in the initial set up, follow on costs other than in feeding material is low.

ITEM	COST
1,000 m ² Worm bed (inc. construction)	£10,000
Worms (500kg)	£3,000
Bedding	May be sourced from paper mills and farms

Wormbreeders can expect to earn up to £800 per 300m² bed per month from selling worms. Vermicompost is sold at around 80p per litre; vermicomposters composting green wastes are paid around £25 per tonne “gate fee” by the local authority for diverting waste from landfill.

SOURCES OF FURTHER INFORMATION

www.communitycompost.org

www.soilassociation.org

www.wormresearchcentre.co.uk

www.thewormcastcompany.co.uk