

1127
UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

See Revision file
Leaflet FL-23
Revised June 1952

Washington 25, D. C.

EARTHWORMS FOR BAIT

Prepared in the Branch of Game-fish and Hatcheries

Earthworms--known also as angleworms, dewworms, gardenworms, groundworms, night crawlers, rainworms, and redworms--have been used by anglers for centuries as lures for fresh-water fishes. As early as 1496 there was published in England in the Book of St. Albans an article entitled "Fysshyngge wyth an Angle," by Julia Berners, a Benedictine nun. The article gave explicit instructions on the best kinds of worms to use for bait and where to look for them.

Earthworms thrive in almost all kinds of soil but do best in those containing organic matter. They are especially plentiful in old lawns and wild grasslands.

COLLECTING EARTHWORMS

To get earthworms for bait, turn over the soil with a shovel, fork, or mattock. Their burrows are often well hidden, and the entrances are sometimes plugged with leaves, seeds, twigs, or pebbles. During humid seasons, earthworms come out of their tunnels to feed and mate, and probably to migrate; they have been known to travel considerable distances. They emerge also during rainstorms at night, but they are rarely on the surface when high winds prevail. After dark in clear weather, earthworms may be gathered on the surface on almost any piece of fertile soil, particularly under large trees, with the aid of a dim light--a lantern or flashlight covered with a piece of cloth or tissue paper, or fitted with a red glass. During dry weather, earthworms go deeper into the ground. They may be brought to the surface after dark by sprinkling the ground around their burrows thoroughly just before sundown; but if the temperature falls much below 40°F. they will not come to the surface when the area is wetted down, and it will be necessary to dig them out. Compost heaps or soil receiving the dishwater or drains from the kitchen sink should not be overlooked.

Earthworms are sensitive to vibrations, and some may emerge from their burrows if the soil surface is tapped. Another procedure is to find an area where earthworms are known to be, drive a stick into the soil to a depth of about 10 inches, and knock on the side of the stick until the worms come up. By drawing a board or the side of an ax back and forth across the end of the stick, a vibration is set up in the surrounding soil, and in ideal situations such a vibration has caused earthworms to come to the surface as far as 25 or 30 feet from the post. This method of collecting earthworms is known locally as "fiddling" or "grunting."

RAISING AND STORING EARTHWORMS OUTDOORS

A wooden box, 14 by 18 by 6 inches, is recommended for raising worms outdoors. Such boxes may be stacked, held apart by small blocks. This arrangement in tiers provides for ventilation, drainage, and easy access for watering. The boxes should be supported above the ground on a base about 6 inches high. When a box is set flat on the ground, the wood deteriorates and the worms may escape and burrow into the ground.

Material for filling the boxes may be one part stable manure, one part screened topsoil, and one part peat moss. A sprinkling of corn meal or mash may be added.

If mash is used, the proportion should be about $\frac{1}{2}$ to 1 pound for each cubic foot of filler-material. If corn meal is used, about $\frac{1}{2}$ pound for each cubic foot of material is sufficient. The mash or corn meal provides a ration of carbohydrates, proteins, and fats for the worms so that they will be well nourished. In order that the mash or corn meal can be uniformly distributed, it should be added before the other material has been wet.

A layer of alfalfa or other hay should be placed in the bottom of each culture box. This improves drainage, prevents the compost from adhering to the bottom of the box, and is favored by the earthworms as food. Each box should be about two-thirds full of the prepared culture material. Five hundred breeder earthworms should be placed in each box and covered lightly with the culture material. One or two thicknesses of well-soaked burlap should then be placed in the box to conserve moisture and keep the surface of the material dark and damp. The worms should be watered once or twice a week, the time depending on the weather and temperature. In watering, a gentle sprinkling is necessary so that the surface of the culture material will not be disturbed. The food supply in the box should be checked from time to time. This is done by lifting out and examining a handful of soil. A satisfactory food for supplementary feeding consists of 5 pounds of commercial rabbit food (pellets), 1 pound of soybean meal, and 1 pound of sugar. The pellets, meal, and sugar should be moistened to form a soft crumbly mass, then stirred into the culture material. The worms will also thrive on foods such as kitchen and garden wastes, fruits, and vegetables.

RAISING EARTHWORMS INDOORS

A wooden box 3 feet long, $2\frac{1}{2}$ feet wide, and $1\frac{1}{2}$ feet high, is recommended for use in raising worms indoors. An important fact to remember is that the seams of the container must be adequately sealed to prevent the worms from escaping. The top of the box should be fitted with a frame covered with hardware cloth. Having the frame hinged to the box and fastened with a small screen-door hook makes a very convenient set-up. Several small holes should be drilled in some part of the bottom of the box for drainage. The holes should be covered with fine-mesh copper screen that is tacked to the container. If the worm containers are kept in a place where they cannot drain freely, small receptacles such as tin cans should be placed under the holes to catch the excess water. Adequate drainage must be provided because excessive moisture in the culture material will sour the feed and kill the worms.

The preparation of indoor culture boxes is the same as for outdoor boxes. The same feeding and watering procedures also apply.

HARVESTING EARTHWORMS

After 21 days the box or boxes will be full of egg capsules and ready for harvesting. The contents of the culture box may be dumped on a smooth table and the material raked into a cone-shaped pile. After the worms have had a few minutes to work down from the surface, it is time to start raking the material from the surface of the pile. The material removed contains the egg capsules and should be placed in a newly prepared culture box. This process may be continued until two-thirds or more of the old culture material has been transferred to the new box. (Any worms encountered in the top material should be replaced in the old culture box.) The bottom third of the material on the table contains the breeder worms and should be returned to the old culture boxes, which should then be filled with new material and prepared as at the start.

The boxes loaded with capsules will be ready for harvesting operations in 60 to 90 days. With mature breeding earthworms, a harvest is taken every 21 to 30 days.

As the worms will stop producing capsules if a culture box becomes too crowded, the number of worms should be limited to 500 or 600 per box. The worms tend to limit their population to correspond to the available food.

Culture boxes should be kept fairly dark, as earthworms work in darkness. The boxes should also be moist throughout, though not soggy. If they are maintained in outdoor shade, the boxes should be protected from flooding rains.

THE BAIT BOX

Keeping earthworms alive and in good condition while they are being used in the heat of the sun, requires a suitable bait box. A satisfactory one may be made at home from galvanized or aluminum sheet metal and lined with quarter-inch sheet cork. The lining should be heavily coated with paraffin to make it waterproof and keep it sanitary. The box is then encased in a canvas jacket, which is laced on so that it may be removed for cleaning. In use, the jacket is kept wet so that evaporation keeps the interior of the box cool.

Earthworms may also be carried satisfactorily in a small cloth sack filled with sphagnum moss. The sack should, of course, be dampened whenever necessary during the day.

PREPARING EARTHWORMS FOR MARKET

Earthworms are often marketed when freshly dug from the ground, but they will live longer on the hook if "scoured" in a stoneware crock or wooden box. To scour the worms, place them in a quantity of sphagnum moss (the moss used by nurserymen to pack plants for shipment). Squeeze excess moisture out of the moss before placing it in the container. The worms should be left in the moss in a cool place for 2, preferably 3 or 4, days. At the end of this period, the worms will be almost transparent but tough and lively. If it is necessary to leave them a week or longer in the moss, a little fresh milk should be poured over them at weekly intervals, but the moss should be rinsed out in clean water every 7 to 10 days.

* * * *

REFERENCES

- HILL, MELVIN H.: 1942. Raising Earthworms. The Aquarium 11(5): 86-87.
- KYLE, GEORGE J.: 1949. Fishing Worms and How to Raise Them. Newville, Pa.
- MILLER, D. J.: 1952. Earthworm Raising. Mimeographed. 4pp. Murray, Ky.
Harvesting Earthworms. Mimeographed. 2pp. Murray, Ky.
- MUNSELL, J. W.: 1942. Fishworm Culture. Ohio Cons. Bull. 6(12): 20.
- SWINGLE, H. S., and D. G. STRUKIE: 1943. Raising Fishworms for Bait. Agr. Exp. Sta., Ala. Poly. Inst., Auburn, Ala. Mimeographed. 1p.
- WALTON, W. R.: 1928. Earthworms as Pests and Otherwise. U. S. Dept. Agr. Farmers' Bull. 1569, 14 pp. illus. Available only in public libraries.