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## Earthworms: Their Intensive Propagation and Use in Biological Soil Building - Part V

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Animals, cont'd

piece until he had cleared the rack and made a sort of jack-straw pile on the ground under the shelter. Then he repeated the process with the lumber underneath, which I had stacked on the blocks, until he came to some four by fours laid side by side. These he left for a floor. Then he proceeded to go to work on the racks. These were pieces of board nailed together in the shape of a right triangle and affixed to the wall of the barn. By a process of butting with his head and hooking with his horns he got them off the wall so that he could stand or lay close to the wall of the barn. It gave him more protection during thunder showers.

Now a scientist would say that this work of Billy only amounted to random effort and that the result of making a more comfortable place for a night-time bed or to get out of the rain was purely accidental. I like to think that he looked the situation over and planned the whole thing. It seems to me that the effort he put out was too constant to be called a random effort. But then I am not scientific. If I were I would get a hundred billy goats and . . .

**Animal Communication**  
I also find that the goats are not dumb vocally either. They have a whole range of different bleats and baas and each one

has a different meaning. Of course the difference lies in the tone and volume rather than in words but what is the difference as long as it carries a message; and when Honey gets her head caught in the fence her message is unmistakable. Furthermore I think that the goats understand me when I talk to them. I have trained Sweetie to obey me and do what I want her to in regard to coming to me, leaving certain shrubbery alone, standing still, leading on a chain, etc., almost entirely by voice requests or commands. Sweetie is the least one. I bought her with her mother when she was less than two months old. I believe that all the goats get messages mentally and also beam messages to me. But don't send for the headshrinkers because I am enjoying my illusions and so are the goats.

The reason it sounds crazy is that only humans are supposed to have minds and mentality. I think animals are no different than humans in this respect but only equipped with different means of communication and of fulfilling their desires. Whether or not it is true I will not attempt to prove. It makes a good working hypothesis to use in raising and training the animals on the homestead for greater production and enjoyment. So it seems to me.

Earthworms

Their Intensive Propagation and Use  
In Biological Soil Building

Part V (continued from last month)

(Excerpted from a booklet of the above title.)

By Thomas J. Barrett

Harvesting the Earthworm Increase

A table, 28" high and 30" wide, of any desired length, is a convenient size for harvesting the increase. It is well to have the top covered with metal for smoothness and without cracks, so that no worms can crawl into cracks. If there are a number of boxes to service, a long table can be used and a number of boxes dumped at one time. The table should be in a lighted place, either in mild sunshine or under electric lights, which will cause the worms to work down toward the bottom and center of the pile of compost.

Dump contents of a culture box on table and rake the material into a cone-shaped pile. The material which adheres to sides and bottom of box can be carefully scraped out with a small trowel, old dull caseknife or a putty knife. Never use a sharp-edge cutting tool in handling earthworms. While worms will stand considerable handling, they should not be cut or injured. Have the same number of new culture boxes as have been dumped, ready with layer of hay or burlap in bottom. The old culture boxes, with original label or number on them, should be prepared again for loading, same as in the beginning. They can be used for the breeder worms again.

Start on the surface of the cone-shaped pile, raking the material off lightly with the fingers, so as to not injure the worms, and placing the material in the newly prepared culture boxes. Any worms encountered should be transferred back to the old culture box. If the material has been allowed to stand for an hour or two after dumping, before the harvesting is started, most of the worms will have worked well downward toward the bottom and center of the pile. In the manner outlined, work downward from the entire surface of the pile until fully two-thirds or three-fourths of the old compost has been transferred to the new culture box. This harvested material will contain most of the egg capsules that have been produced during the previous 21 to 30 days.

Balance of old compost containing the mature breeder earthworms should now be returned to old culture box, the box filled with new compost and prepared as at the original start.

New culture boxes should be properly labeled and a new tier started. The cultures started with the harvested material will require 60 to 90 days to develop before they are ready for harvesting. With breeding earthworms, the harvesting process can be carried out every 21 to 30 days. Incubation period of egg capsules is 14 to 21 days under proper temperature conditions. Therefore if harvesting is carried out regularly every 21 days, practically all egg capsules will be transferred to new culture boxes, to develop and build up additional breeding stock.

Any system of marking can be followed by the individual that may suit his inclination. We usually number the boxes, maintaining two series of numbers. One series is for the mature breeder earthworms; the other for the developing egg capsule cultures. As the new cultures reach maturity they are transferred to the breeder series.

In setting up new breeder boxes, it is well to actually count the worms, allowing 500 to 600 mature worms to each breeder box. It is impossible to recover all the egg capsules, therefore from time to time (as inspection will determine) the breeder boxes should be worked over and the number of mature worms reduced to about 500 or 600 to the box. If the worms become too numerous in intensive culture boxes, they will stop producing capsules.

Experience has demonstrated that best results in capsule production in lug boxes will be attained if the number of mature worms is held down to 500 or 600 to the box. On the other hand, in the boxes where the capsules are hatching and young worms developing, from 1000 to 1500 young worms may be allowed to reach

maturity in each box, at which time new breeder boxes can be set up with the proper number of worms.

Building Large Compost Beds

Once an adequate number of lug box cultures of mature breeders have been established, all harvested material can be used for impregnating large compost beds for biological soil building. Or the increase can be used for impregnating flower beds, potted plants, lawns, shrubs, trees or orchards.

As has been previously stated, multiplication is extremely rapid. Actual count was kept of the capsules harvested from a setup of four culture boxes of 500 breeder worms each, for a period of one year. A total of 55,000 capsules were counted, the increase being used to impregnate soil building compost.

In orcharding, a setup of 100 boxes of mature breeding earthworms, properly handled, would produce sufficient increase to impregnate 100 trees each month. The harvested, capsule-bearing material can be buried around the trees, well back from bole of tree, with a cover of prepared compost to provide special food and moisture for the developing worms. Once earthworms are established in the soil, they will take care of themselves provided there is sufficient moisture for the growth of good vegetation.

For intensive capsule production temperatures of from 60 to 70 degrees will be found favorable for best results. Even higher temperatures in well-shaded locations will not be harmful, provided plenty of moisture is always present. Drying out quickly affects worms and may stop reproduction.

Boxes should be kept fairly dark, as earthworms work in darkness. We usually provide covers for the boxes or tiers of boxes, made of old potato sacks or other sacks. Any cheap material will do. Worms prefer to work near the surface of culture, therefore we keep the surface of culture covered with damp burlap, as previously outlined, to conserve moisture and provide darkness on surface of compost.

Earthworms were originally water animals. They require plenty of water, so cultures should be kept moist, but not soggy wet. Boxes should not be flooded and good drainage should be maintained, so that surplus water will quickly drain out.

If cultures are maintained in outdoor shade, the tiers should be protected from flooding rains. Sheds, outhouses, basements, lathouses, good tree shade or other shade will prove satisfactory locations for earthworm culture setups.

Culture boxes should not be placed flat on the ground or other surface, as the worms would work out of boxes into the ground or gather under the damp bottom. Therefore, as previously outlined, a support for the tiers of boxes should be made of 2x6 (2 pieces) material, stood on edge 13 3/4" apart. Any length base can be provided, according to the number of tiers that are to be placed on such a base. The tiers are thus supported at base 6 inches above the surface.

As a rule, the purpose of box culture is to develop breeding earthworms as rapidly as possible, for impregnating soil-building compost beds or compost heaps. Through years of experimentation, it has been found that earthworms of the domesticated variety will produce more egg capsules in the concentrated box cultures of 500 worms to the box than in any other manner.

Worms survive as good breeders for many years, therefore mature breeders are easily maintained. However, each worm may provide from a few capsules per year to as high as 150 or more per year. As each egg capsule hatches out from one or two to as high as 20 worms in some cases, it is seen that the worm will leave plenty of offspring behind to take his place in case of his untimely end.

(continued next month)

Letters To The Editor

In the Rockies

To the Editor:

We Colorado School of Living people are scattered around in the Rockies, but I have been in touch with several by mail. We'd like to have a camp for youngsters on our homestead in the summer of '67. We have logs for building, lots of cheap lumber, plenty of wood for heat and cooking, more wild fruit than anyone can pick. We'd develop our camp along the Nearings' idea: half a day labor for food and half a day free. — Mrs. Grace Wade, Box 6, Walden, Colo.

A Wisconsin Thoreau

To the Editor:

Twenty-seven years old, I am completing my sixth month living in my cabin in the semi-wild of southern Wisconsin. I have managed to become more and more self-sufficient, but haven't gone into food production yet (soon). I am busy with saw and ax, beautifying our local forest and river, and studying—American history, conservation, philosophy, poetry, physics, music and dance. I hope to go into full homestead living, and see my present situation as a training

ground. I am happy to be in close touch with nature, avoiding some of the nuisances of life in the mass. **Green Revolution** readers would be welcome to stop by and visit, and correspondence is welcomed.—Ted O'Dell, Rt. 1, Brodhead, Wis.

Help on Saws and Stoves

To the Editor:

Does anyone know of a store or factory selling ice-cutting saws? Can a wood burning stove be made out of a large steel drum? — J. J. Jura, 61 W. Ontario, Chicago, Ill. 60610.

How Educate or Convince?

To the Editor:

I still believe that a reversal of our mad rush to industrial and political centralization is of vital importance. You see symbolic hope in the public barometer reading "Fair," but I fear the world will learn only through a

(continued on page 4)

Letters to  
Other Editors

**Tragedy.** The day after the report of the burning of the three American astronauts in their space cabin on the ground, Harold Lefever's letter to the editor of the York, Pa., Dispatch said: "Yes, it is a terrible tragedy that three young men lost their lives in space research. True, their young children will never again be carried on their fathers' shoulders. (But a substitute sometimes works well.) In the **New York Times** issue reporting their death I saw an account of a new napalm bombing and scores killed in Vietnam. How many Vietnamese children will never again be carried on their mothers' bodies? How many mothers

Editor Homesteads

[F. V. Elliott, editor of **The Herald of Health** (Lamoni, Iowa), writes us that he likes **The Green Revolution**, and aligns himself with other active on-to-the landers. He runs true to form, and we welcome him as another Editor-Homesteader.]

I am an ex-college instructor, almost 74 summers young. I got acquainted with the organic method from a vigorous, intelligent, senior citizen, and have practiced it for years.

On our homestead we have a large variety of produce grown organically without "commercial" fertilizers or sprays. I found a few tomato worms this year but left several as food for the parasites that cover them; the few others I pick off and step on. We hand-pick the few potato beetles that appear. We use organic methods in our greenhouses, liking kelp, bone meal, rock phosphate and humus. We have three compost bins and feel that with plenty of compost little, if any, other fertilizer is needed in most soils.

We have about 30 hens and a rooster. We buy no commercially mixed feeds for them. Shelled corn is a main feed. We like to mix kelp in damp shorts for them. When we run out of oyster shell we sometimes put a mixture of sand and bone meal in their hopper.

A part of our family is three grade goats. We get the best unsprayed alfalfa possible for them. Kelp and rock phosphate has been spread on their pasture. Always before them is a box of a mixture of salt, bone meal and kelp. They do not care for bone meal alone. We know little about sick goats as we do not have them. Water from our house well is kept before them, warmed in the winter, and not the medicated, fluorinated, chlorinated, etc., town water.

We have about 13 colonies of bees. These pollinate our orchard and garden. We reluctantly use the honey because of the poison sprays used so lavishly hereabouts, and send away to a spray-free locality for a 60 lb. can once in a while when our budget allows.

Our vigorous vegetarian 12-year-old dog is also a part of the family along with cats to keep the balance of nature rat and mouse wise.

Our income is small, our overhead small, the rewards of this homestead are large, and we think it a very satisfactory way of life.

there will never see a child again? All those scorched, scarred and dead people add to our grief. The astronauts' death was accidental; the death of the Vietnamese was deliberately planned. Let this add urgency to our finding and eliminating the causes of war."

\* \* \*

**Trusterty.** In the December **WIN** (5 Beekman St., New York City), David Stry (Cerritos 5, Cuernavaca, Mex.) said to the editor:

"In your item on Provo Manifesto, it says: 'No private property; as much common property as possible.'"

"This is slightly fuzzy thinking, since we must distinguish and separate the nature of two kinds of things:

"1. Things that are created by nature, such as land, rivers, oil, mines, etc., must be regarded as a trust for everybody's use, without any privileges to individuals, groups, corporations, governments, etc.

"2. All material goods that are created by man, such as buildings, machines, transportation and communication media, clothing, etc., are properly the property of individuals. They put energy into them."

\* \* \*

Question: How are the concepts in Trusterty related to the facts in Tragedy?

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