

2-1-1967

Earthworms: In Biological Soil Building - Their Intensive Propagation and Use - Part IV

Thomas Barrett

Follow this and additional works at: <https://research.library.kutztown.edu/greenrevolution>

 Part of the [Soil Science Commons](#)

Recommended Citation

Barrett, Thomas (1967) "Earthworms: In Biological Soil Building - Their Intensive Propagation and Use - Part IV," *Green Revolution*: Vol. 5 : Iss. 2 , Article 15.

Available at: <https://research.library.kutztown.edu/greenrevolution/vol5/iss2/15>

This Article is brought to you for free and open access by Research Commons at Kutztown University. It has been accepted for inclusion in Green Revolution by an authorized editor of Research Commons at Kutztown University. For more information, please contact czerny@kutztown.edu.

The Time Has Come For A Third Force In The Explosive World

Part III

As Gandhi's plan has developed, it can be briefly described as giving priority to the development of agriculture and to the crafts and intermediate industries which process and distribute what the farmers produce—leaving heavy industry to develop naturally as a result of the demand created by the increased income of the rural masses. This is not a call for increased production of cheap food for the urban population and increased production of cash crops to supply raw materials for urban industry. It does not, therefore, aim at promoting the mechanization and commercialization of agriculture. This would be justified only if the aim were urbanization, and the depopulation of the rural regions.

The interest of the Foundation and the Sangh is two-fold: (1) to improve the conditions of the families living in the villages, and (2) to make possible an economic and cultural renaissance in the villages in which they live.

To make this possible each family as a unit must be provided with enough modern "know how," enough land or capital equipment, and enough housing to be independent and to end exploitation not only by landlords, money-lenders and middlemen, but also by those promoting urbanization and industrialization. Loans of the four kinds which the Foundation will provide will make this possible.

In Pakistan and India large American foundations such as Ford and Rockefeller have gone far to perfect the seeds and fertilizers for the various climates and soil conditions. But even the Ford Foundation in their latest report, *Roots of Change*, laments the scarcity of rural credit needed for the new technologies: "Farmers cannot get adequate low-cost credit to finance improvements; according to a study by the Reserve Bank of India, 75 per cent of India's rural credit is provided by moneylenders, traders, and landlords, usually at usurious interest rates."

The Need for Rural Credit

If what Gandhi envisioned for India is to be realized, the highest priority must be given to rural renaissance. If the peasants and villagers — three-quarters of the whole population — continue to be ignored, the misery and injustice inflicted upon this hardest working class in the nation will lead to an economic collapse, a Communist revolution, or both. These peasants and villagers should not be treated as objects of charity. They are, in spite of their abject poverty, self-supporting. They produce the basic essentials — the food and fibers which the nation needs — under every possible handicap. They do not strike. What they ask for and what they are entitled to receive is the opportunity to help themselves.

The need of the hour, according to Dr. B. R. Shenoy, India's most distinguished economist, as he wrote in *The Times of India* on Feb. 22, 1966, is the provision of adequate credit to these farmers. "When the bulk of the capital resources is drawn into public sector undertakings, someone in the economy must go short of capital. In the Indian context that someone includes the cultivator, though he receives much lip sympathy. Capital being scarce, we cannot pursue prevailing investment policies and yet provide necessary credits to the cultivator. A rural bias to planning may not meet the needs of the problem if by that is meant the creation of mammoth projects in the rural sector in place of mammoth projects in the industrial sector. What the situation calls for is no less than the provision of more credit to the 70,000,000 farmers to enable them to acquire better seeds, more fertilizers, better implements, and more irrigation; and to strengthen their holding power for better

prices for their products."

In spite of what Dr. Shenoy calls "lip sympathy," nothing adequate is being done to meet this need. In spite of exploitation by landlords, by money-lenders, and by middlemen, cultivators carry on amidst the most heart-rending privations for young and old. In spite of the official policy of keeping down the price of food crops to provide cheap food for industrial workers and cheap fibers for industry in the big cities of India, they continue the task of trying to support themselves as they have done from time immemorial. It is to their salvation that the Gandhian movement, under the leadership of Vinoba Bhave, Jayaprakash Narayan, and thousands of workers in the Sarva Seva Sangh is dedicated.

Agricultural credit, however, is not only the need of the hour in India. It is the need of the hour in all the underdeveloped nations of the world. It is not an exaggeration to say that in all of these nations there is a race between providing this rural credit and dealing with peasant revolutions.

The I.F.I. Plan

To transform the Indian movement into a worldwide "third force" capable of coping with this problem in all the underdeveloped nations, it is not enough, however, to equip it with the capital to supply the credit needed. To enlist the enthusiastic support and allegiance of the masses of peasants and villagers the Foundation must not only become an economic force but must also be a moral, cultural, social and ideological force. In India the Gandhian program of nonviolence and education has demonstrated that it can be such a force. But to make it into such a force, the movement must become capable of dealing with the real problem which the whole world faces at this time. The International Foundation for Independence has been organized to provide this non-political and nonviolent movement with this instrument.

The plan of the Foundation is two-fold: (1) to obtain a Revolving Fund large enough to provide the credit for this purpose by issuing debentures, and (2) to use this Revolving Fund to make loans upon banking and actuarial principles in the villages of the nations in which it operates. The Foundation, which is a non-profit corporation, will accept donations also, and these donations may be used by it either to make loans or for other purposes which will implement the movement. But the Revolving Fund, and any reserves created through its operations, are to be used solely for the purpose of making loans.

The initial target for the Revolving Fund is \$100,000,000. It will begin operations, however, the moment subscriptions begin to be received. Actually, a pilot project in one village in India has already been undertaken. Subscriptions are initially to be sought from thoughtful and concerned men and women who may wish to make outright donations but who will also consider the Foundation program a way of using some of their investment funds to help meet the economic and political crisis which the world faces. Ultimately, after the Foundation's debentures have been seasoned and the practicability of its operations proved, the enormous sums needed for this purpose throughout the world will be obtained by the sale of its debentures through underwriting syndicates. Blocked funds in the underdeveloped nations owned by foreign corporations and by governments which have provided aid to them will also be sought, provided they can be obtained without any kind of political or commercial strings attached to them.

Four kinds of loans are envisioned:

1. **Short Term Loans**, repayable within a crop year. These

will be loans for seed, fertilizers, pesticides, and any other supplies needed by a farmer to put in a crop by the most approved modern methods. Short term loans will also be made to village craftsmen and to village enterprises which process or distribute the crops raised by the farmers.

2. **Medium Term Loans** for equipment and for improvements which can be amortized in a few years.

3. **Long Term Loans** for the purchase of land individually by families, for the purchase of land by villages to be then reassigned to individual farming families, for building warehouses, for irrigation, roads, wells, and other long term village improvements.

4. **Bank Loans** to village "credit unions" and cooperative and other banks to rediscount loans of the first three types which have been made by them and so enable them to make additional loans of the same kind.

The negotiation of these loans and the supervision of the use of the loans will be in the hands of resident Village-Supervisors trained as prescribed by the Foundation. The actual money loaned and the actual money collected will be handled by local banks and not by the supervisors. Interest rates and service charges will vary from place to place and from time to time but will be high enough to cover all costs of operation, to pay the interest on its debentures, and to create a reserve for bad debts and for possible crop failures.

At present, farmers in India are still paying money-lenders usurious rates of interest, varying from 37½% per annum to 10% per month. The funds now available at reasonable rates through cooperatives and other agencies encouraged by the development programs of the government are utterly inadequate for the development of agriculture and of village industry.

The four types of loans planned by the Foundation would enable farmers to increase their production and as a result achieve a decent standard of living. It would also provide them with an immense reservoir of buying power and of effective demand for the products of both intermediate and basic industry. It would enable them to hold their crops in public warehouses for peak prices, instead of as at present being forced to surrender them at low prices immediately after they are harvested. What they are now paying in rent to absentee landlords, in usurious interest to money-lenders, and in the form of exorbitant profits to middlemen could be saved, used to repay the Foundation and ultimately make them entirely free and independent. This repayment would make it possible for the funds initially loaned to one farmer to continue the work of improving conditions for other farmers.

Since the whole plan of the Foundation will be based upon the integrity and acumen, and the credit, collection, and agricultural "know how" of the village-supervisors, the selection and training of these supervisors is all-important. To provide these the Foundation will sponsor training institutions in the indigenous universities in each region of each nation in which it will operate. To organize the teaching in these regional institutes, an International Independence Corps will be specially trained. The Corps will include both the Institute-Supervisors and Auditor-Supervisors who will at least once a year inspect the records and make a report on the efficiency of the Village-Supervisors. The Auditor-Supervisors will have the powers of bank examiners and will instantly suspend all Foundation operations in a village if they find derelictions on the part of a Village-Supervisor. Operations will only be resumed when conditions have been corrected and a new Village-Supervisor appointed.

To ensure proper training of both the Institute and the Auditor-Supervisors, a research and teacher-training institution is being organized, to be known as the International Independence Institute. The Institute will be located in Exeter, N. H. In addition

Earthworms

In Biological Soil Building Their Intensive Propagation and Use

Part IV (continued from last month)

(Excerpted from a booklet of the above title.)

By Thomas J. Barrett

For lug box culture, a fine compost may be prepared of one part horse manure, one part screened top soil and one part peat moss. Or a mixture of manures may be used. Or a mixture of one part horse manure and one part rabbit manure.

For long compost beds, where from one to several cubic yards of material is composted, all kinds of manures and vegetable waste can be used to advantage, but for intensive production of capsules in lug boxes it is highly desirable to have a very fine compost of crumbly material that is not too disagreeable or messy to handle with the bare hands or with gloves.

In addition to the compost material as outlined, we work into the compost a liberal sprinkling of some standard, all-purpose chicken mash. The proportion used should be about 1 lb. of mash to each cubic foot of finished compost. This mash provides a balanced ration of carbohydrates, proteins and fats for the worms, insuring that they will be well-nourished regardless of the organic composition of the composted soil-building material. The mash should be added before the compost has been wet, so that it can be evenly worked into the mixture.

In preparing compost, we usually mix about three cubic feet of material, which is about all the mixing box will accommodate. An apple box is a handy measure, as it holds approximately one cubic foot. It is not necessary to bother with too fine a measure, as these proportions as outlined are roughly approximate.

We take one apple box (or other measure) of manure, one box of good loamy topsoil and one box of peat moss, plus 3 lbs. of chicken mash. The peat moss may be soaked ahead of time, broken up and squeezed out. It requires several hours' time to fully impregnate peat with water. We usually soak it 24 hours before mixing compost and then thoroughly squeeze the surplus water out. Materials are measured dry, as it will bulk up after water is added. Peat moss is best for lug box culture, as the idea is to obtain a compost that will retain a high water content without being soggy or muddy.

Commercially, egg capsules are valued at 1 cent each, because of labor cost and handling. We value each lug box culture of breeder worms at about \$10. On the other hand, in production for use in the impregnation of soil, capsules can be produced by the millions at practically no cost other than the cheap and abundant material used. Materials used in earthworm culture are the identical materials that should be added to the soil anyway in maintaining fertile and productive soil.

Earthworms in Culture Boxes

A layer of alfalfa hay about 1 inch deep should be placed in bottom of culture box; or one or two thicknesses of old potato sack material; or other gunny sack material can be used instead of the hay. The hay or sack improves drainage, is favored by the worms as food material, and prevents compost from adhering to the box. Then fill box two-thirds full of the prepared compost.

500 breeder earthworms should be placed on top of the compost. If the worms have been received in a shipping container, they will be mixed with prepared earthworm food. Contents of the shipping container can be dumped into the prepared box and raked lightly over the surface. They may be covered with a few handfuls of additional compost. However, they will quickly work downward into the compost, making their own burrows.

After the worms are added, cover the surface of compost with a piece of wet burlap. We usually cut an old gunny sack into 6 or 8 pieces, approximately the size of the top of a box and keep them soaking in a bucket of water. If they are larger than the box, the edges may be folded over inside the box. This burlap cover does not need to be disturbed until the culture is ready for servicing. The cultures are sprinkled from time to time through this burlap covering, which acts as a spreader for the water and prevents the water from disturbing the surface of the culture.

To impregnate culture boxes with egg capsules, prepare the boxes as outlined in the preceding paragraph. Then spread 500 to 1000 earthworm egg capsules over the surface of the compost and cover with one inch of additional compost. Cover with burlap (same as outlined for the breeder worms).

If the culture is kept at a fairly warm temperature (60 to 70 degrees), in shade or under a shed or in a basement or other shelter, the capsules will hatch out and develop to the reproductive stage in 60 to 90 days. The culture should not be disturbed during development, except for the necessary watering. After 60 days the culture may be examined to determine if capsules are being produced. If capsules are found, then the culture should be handled thereafter in the same way as the culture boxes of mature earthworms.

Earthworms require plenty of water if they are to multiply rapidly. The compost material should be kept moist but not soggy wet. Sprinkling with hose sprinkler or a sprinkling can should be carried out once or twice a week, according to what is necessary to keep contents of boxes moist.

Proper state of moisture must be determined by inspection, until experience shows correct routine of watering. The point of prime importance is to never allow the cultures to "dry out." Preliminary to harvesting the increase, the culture boxes may be allowed to become somewhat dry for a few days, so that the material can be handled without trouble. Wet, muddy compost is not so readily handled as fairly moist, crumbly material.

tion to its own faculty and to visiting resource leaders, it will draw on the Extension Service of the University of New Hampshire to provide the instruction needed by the International Independence Corpsmen. The Honorary Director of the Institute will be Ralph Borsodi; the Director, Gordon A. Lameyer, formerly of the University of New Hampshire; and the Field Director, Robert S. Swann, now coordinator for the New England Committee for Nonviolent Action. Although the International

Foundation for Independence plans to operate initially in India, it will spread into other countries in Latin America, South America, Africa, and Asia. Trustees for the Foundation and the Institute will represent a wide range of interests, including banking, town planning, family planning, conservation, cooperation, and technology. These acknowledged leaders in their fields will be entrusted with the overall supervision of the integrity and efficiency of the Foundation's operations.