MST Adopts Bioinputs as a Strategy to Advance the Massification of Agroecology

By Solange Engelmann. Source: Landless Workers' Movement (MST)

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Driven by the need to advance the agroecological transition and scale up ("massify") a model of agriculture anchored in agroecological practices and techniques in balance with nature and preserving the life of all living beings, the Landless Workers' Movement (MST) has spent the last five years deepening its mastery and articulation of traditional wisdom, ancient knowledge, and new technologies to advance the Popular Agrarian Reform project across the country.

One of the main practices the Movement has been working on, aimed at the massification of an agriculture model based on agroecology, focuses on consolidating a set of skills, knowledge, and experiences regarding the practice of **bioinputs** (biological inputs) in the settlements, encampments, territories, and communities of Agrarian

Reform. These are traditional practices that have been experimented with for thousands of years in family and peasant farming but which, at the same time, do not reject the new technologies available in this field.

"We consider bioinputs as an ancient practice, traditional to peasant agriculture, which is part of the historical knowledge of the peasantry. However, today, with new technologies and biological products, it also contributes to the equilibrium of the system. It is also important to consider, conceptually, the relationship between bioinputs and our biodiversity, utilizing the raw materials we have, such as organic matter," emphasizes Andreia Matheus, an agronomist from the coordination of the National Bioinputs Collective and the Production, Cooperation, and Environment sector of the MST.

What are bioinputs?

The practice of bioinputs is based on a biological matrix that takes into account plant and animal diversity in nature, starting from microbial diversity and the soil itself as living organisms. Bioinputs are the result of the interaction between scientific knowledge and popular peasant wisdom, expressing in practice the revaluation of soil biology and the natural processes that sustain the fertility of the agroecosystem, explains Iara Maria Lopes Rangel, an agronomist from the MST Bioinputs Collective and a member of the technical team at the Egídio Brunetto School in Prado, Bahia.

"Bioinputs are based on the understanding that plant health depends on soil health, and that this, in turn, is linked to the diversity and vitality of the microbiome, the immense community of microorganisms (bacteria, fungi, actinomycetes, algae, and protozoa) that make up the soil food web," points out Iara.

Collection and multiplication of efficient microorganisms for bioinput production by MST peasants at the Ana Primavesi production unit in Viamão, RS. Photo: Ana Primavesi Production Unit, Viamão (RS)

From a technical perspective, bioinputs can be found in various products and different forms of action and application within the agricultural production system. The agronomist explains that they can act in various ways to improve the soil, strengthen plants, and reduce pests, "such as biofertilizers and microbial inoculants; organic compounds and fermented products, like *bokashi*, which increase organic matter and soil enzymatic activity; bio-slurries and plant bio-extracts, which perform natural phytosanitary protection functions, reducing the incidence of pests and diseases without the use of agrochemicals; and isolated microorganisms, such as *Trichoderma*, *Bacillus*, *Azospirillum*, *Rhizobium*, and *Pseudomonas*, which act in the biological control of pathogens, biological nitrogen fixation, and the stimulation of “National Plan Plant Trees, Produce Healthy Food”, which since 2020 has intensified tree planting with the goal of planting 100 million trees in ten years in Agrarian Reform territories and urban areas. The intention is to strengthen the production of healthy food and denounce the destructive impacts of agribusiness on the environment.

The progress in tree planting, with 45 million trees planted so far, combined with food production, has also become an important factor in fostering biodiverse food systems. These systems are gradually decreasing dependence on external inputs, "as foreseen in the transition process to an agroecological production model and the redefinition of the

landscape, enabling the construction of pesticide-free and autonomous territories, aligning social, political, economic, and environmental issues," highlights Iara.

Given this, it is evident that the greatest potential regarding bioinputs lies in the implementation of biodiverse food systems in consortium with environmental recovery.

"By incorporating crop diversification, including tree and shrub species, especially those native to the biome in question, into food systems, this above-ground plant biodiversity naturally stimulates and provides a wide and diverse food web, resulting in the integrated health of the ecosystem," explains agronomist Iara.

A Pillar in the Massification of Agroecology

Collection and multiplication of bioinput microorganisms, produced and used by MST peasants. Photo: Iara Rangel

In this context, the MST, through the work of its Production sector, together with peasant families, cooperatives, and associations, has been incorporating the ancient peasant practice of bioinputs as a strategic pillar for the massification of agroecology. This process is articulated and allied with new technologies in family and peasant farming, based on the perspective of agronomist Ana Maria Primavesi, a reference in research on ecological soil management, who understands the soil as a living organism where fertility depends on balanced biological activity.

"Abundant and diverse soil life promotes continuous reactions and interactions between the soil-plant-environment system, improving the health of the soil as a whole and, consequently, of the plants. This results in food of high biological and vital value, capable of nourishing not only the human body but also the ecosystems that sustain it," highlights Iara.

The "Living Soil" Method

The MST's proposal is founded on the integration of food production and the use of bioinputs with the "living soil" method, idealized by Ana Maria Primavesi, which has been guiding agroecological practice in Agrarian Reform areas.

The "living soil" method is principled on the recomposition of nutrients, life, and soil quality, valuing traditional and popular knowledge alongside new ecologically-based technologies. From this, a continuous process of training and practice is developed, aimed at recognizing popular and peasant knowledge, experimentation in productive units, and the scientific systematization of this entire process.

"In the perspective of the MST and Ana Maria Primavesi's ecological soil management, the production and use of bioinputs have two inseparable dimensions: 1) Technical: aimed at the regeneration of fertility and biological balance of degraded soils; 2) Political and pedagogical: in the construction of peasant autonomy, the social control of technology, and the training of technicians and peasants as multipliers of this knowledge," emphasizes Iara.


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Management of the "living soil" method for bioinput production. Photos: Iara Rangel

In the MST's agroecological practice, the "living soil" method is therefore based on the political and technical debate surrounding the Popular Agrarian Reform project, which encompasses caring for the soil to recreate life and sovereignty in the territories. In this process, bioinputs become central allies to the massification of agroecology by recovering the soil and democratizing knowledge, ensuring healthy production rooted in biodiversity principles.

Regarding the method, Iara explains that "living soil" focuses on valuing soil biology as the engine of natural fertility and plant health. "One of the technologies of the 'living soil' method uses a form of highly controlled composting, with monitoring of

temperature, humidity, and identification of the types of life present in the compost. These diverse organic compounds present a carbon/nitrogen (C/N) ratio that favors and stimulates the broad and diverse multiplication of the soil food web of a given territory," she teaches.

Models Dispute

The practice of bioinputs is also part of the dispute between two production models . In a process very similar to other techniques and knowledge of the agroecological production system, this practice is being appropriated by the destructive model of agribusiness as a 'new technological package.' Within market logic, agribusiness once again seeks to substitute chemical inputs with other inputs deemed "green," but which in practice maintain dependence on transnational companies and corporations of seeds, fertilizers, and pesticides.

"The appropriation of bioinputs by large transnational corporations, which are the same corporations that sold the 'Green Revolution' technological package in Brazil, constitutes an appropriation of knowledge, a traditional practice, and transforms this practice, this technology, into a new commodity. These corporations turn nature's common goods and traditional practices into merchandise and visualize only profit," denounces Andreia Matheus.

Through the massification of agroecology and the adoption of bioinputs, the MST seeks to break with the logic of commerce and the financialization of land and the environment by agribusiness. Currently, Brazil is known as one of the countries with the highest use of pesticides and transgenic seeds, in addition to advancing deforestation, which goes against the grain of the agroecological production system. "Bioinputs are important in this context so that we have a concrete alternative, based on traditional practices of peasant agriculture, to break technological dependence on the 'Green Revolution' package, which today is dominated by transnational companies that sell pesticides, but also sell seeds and fertilizers," projects Andreia.

In this scenario, the same transnational corporations that sell the "Green Revolution" technological package such as Syngenta, Cargill, ADM, Bunge, among others control the global market for grains, seeds, fertilizers, and other inputs, dominating the entire agricultural production chain from the field to the industry. However, it is evident that with the advancement of bioinputs in agroecology, these transnationals seek to appropriate this ancient practice, allied with new technologies, to create new processes for the privatization of bioinputs through the patenting of microorganisms and the transformation of these common goods into market products.

Alternative to Technological Dependence

This new attempt at technological and biological control by agribusiness transnationals reinforces the dependence of farmers and peasants and threatens the popular and autonomous character of agroecology. Given this, MST workers understand that the production of bioinputs must be understood within the scope of the dispute between two models of agriculture: "that of agroecology, guided by life and the sovereignty of peoples, and that of corporate logic, centered on the commodification of nature," emphasizes Andreia.

Therefore, starting from the massification of agroecology, the coordinator of the National Bioinputs Collective and the MST Production sector points out that the MST has sought to enhance the use of bioinputs in agroecological production models by Landless peasants, creating alternatives to break with the logic of dependence on transnational agricultural companies. They aim to build productive autonomy starting from Agrarian Reform territories, where peasants have the conditions to control the production chains aimed at producing healthy food.

"With bioinputs, we break this dependence on the large companies that dominate the input sector. And we build the perspective of a territorial autonomy as well," defends Andreia.

In addition to the threat of the appropriation of bioinputs by transnational corporations and agribusiness, MST peasants also face challenges in accessing inputs and

technologies in the area of agroecology, infrastructure, and credit for development, among others. In this sense, even with difficulties—mainly in building infrastructure and adapting technologies to biomes in each local and regional reality—the Movement invests in the construction of bioinput production units in Agrarian Reform territories, focused on different production processes and technology usage.

Among the various experiences across the country, the Ana Maria Primavesi Unit in Rio Grande do Sul stands out as a reference in physical structure and methodological conception regarding the use of the "living soil" method. Other experiences are in operation at the Egídio Brunetto National School of Agroecological Formation in Prado (BA), focusing on formative and traditional practices of production and use of bioinputs, articulated with political and technical training, in addition to experiences in the Contestado settlement in Paraná and in Itapeva (SP).

"We have some experiences that we are developing in states and regions: the experience of the Ana Maria Primavesi bioinput production unit, in the context of agroecological rice in Rio Grande do Sul. For us, it is a great advance, and the impacts are visible and perceptible from the point of view of the adoption and use of bioinputs in that unit, but we need to advance, to have public policies, conditions for funding to implement these units in greater quantity, at scale, also in Agrarian Reform territories," concludes Andreia.

In this sense, the experience under construction within the MST regarding the use of the ancient practice of bioinputs becomes strategic for the consolidation of agroecology in Agrarian Reform areas and the expansion of healthy food production, promoting advances in food sovereignty, peasant autonomy, and the reconstruction of soil life.

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