ALTERNATIVES TO HIGHLY HAZARDOUS PESTICIDES IN LATIN AMERICA AND THE CARIBBEAN

Nilda Pérez
December 2018

Executive Summary

This report presents possible agroecological alternatives to the use of highly hazardous pesticides (HHP) in coffee (*Coffea* spp.) and in four basic food crops: potato (*Solanum tuberosum* L.), tomato (*Solanum lycopersicum* L.), maize (*Zea mays* L.) and beans (*Phaseolus vulgaris* L.), in Latin America and the Caribbean.

The report analyzes the origin and evolution of the debate about the use of HHPs, the approach to the treatment of the problems they generate, and the work of different non-governmental organizations, academic and research institutions, and especially of farmers for scaling up agroecology as an alternative solution. The review of the literature confirmed that chemical control has been the central solution since the appearance of pesticides.

The "One Health" concept—a collaborative effort of multiple health sciences professions, together with other related disciplines and institutions—is working locally, nationally and globally to achieve optimal health for people, domestic and wild animals, plants, and our environment. The One Health concept helps people to understand that human, animal, plant, soil and ecosystem health is indivisible and will allow new advances on the road toward the elimination of HHPs.

With the exception of Cuba, the tendency in the region has been to increase the use of chemical, synthetic pesticides. The general criterion in most countries has been that chemical control should be the main method to deal with the problem of pests. However, in the region there is actually a wide diversity of pest management practices that are very different from chemical control.

The report analyzes the state of the HHPs ban in Latin America and the Caribbean, based on the information provided in the Consolidated List of Prohibited Pesticides, prepared by the International Pesticide Action Network (PAN). This list is a very valuable tool for this type of analysis, since it gathers information that is difficult to obtain by other means and represents a savings in time and other resources.

The region contains 33 countries, located in four subregions; Mesoamerica, Andean, the Southern Cone and the Caribbean. The consolidated list from PAN has 19 of the 33

countries; the Caribbean is the subregion where information is the scarcest, with only seven of the 16 countries represented on the list.

Brazil has the greatest number of pesticide prohibitions of any nation (76), followed by Suriname (24), Peru (19) and Colombia (19). In the time since the first call was made for the prohibition of HHPs, progress toward the objective has been slow, despite the initiatives, activities and policies implemented toward achieving the goal. Brazil, to date, is the only country that has a proposal for a National Program for the Reduction of Agrotoxics ("PRONARA" in Portuguese), and even that could not be approved by the government of Dilma Rousseff; its future will be uncertain under the newly formed government of Jair Bolsonaro.

With respect to public policies and instruments to support the agroecological management of pests, the report concludes that the practices undertaken to manage harmful organisms in the region must encourage change in food systems, as a whole, among the different actors involved in food production, and in consumers. Brazil ranks first on the PAN International Consolidated List of Banned Pesticides. It is the only nation with pesticide legislation that incorporates exclusion criteria based on hazards, and it's also the only country that has formulated a National Program for the Reduction of Agrotoxics and approved a National Plan of Agroecology and Organic Production ("PLANAPO" in Portuguese). But Brazil continues to occupy first place in consumption of pesticides in the region.

On the other hand, few countries in the region have a specific registry for biological control agents. The lack of records is one of the central barriers toward adoption of biological controls. In Latin America and the Caribbean, Brazil is the most advanced country in registration processes; and Cuba is the only country that has approved, since 1988, a national plan for the production of biological control agents. The case of Cuba stands out because its policies and institutions have a demonstrably relevant role in the adoption of biological control and agroecological pest management.The registration of microbial biological control agents in Mesoamerica is harmonized, which is considered an important achievement for the subregion and a notable step forward for the adoption of biological control.

The report reflects briefly on why sustainable agriculture based on agroecology is the best way to eliminate HHPs. The agricultural model prevailing in the region is industrial agriculture, based on monoculture. Monocultural production systems need intensive management, so it is to be expected that as input intensification increases, pest problems also will increase.

The prevailing food production model presents serious impediments to achieving the objective of eliminating HHPs. To achieve this goal, it is necessary not to rely on the substitution of inputs, since this leaves intact the basis on which the conventional system

rests: monoculture.

The reconversion must be based on changes in design and management, which in turn are based on key knowledge of the biotic interactions. As such, the solution to the problem of pests and pesticides goes beyond the protection of crops, substitution of inputs and integrated pest management, as these concepts are understood today.

When analyzing the factors that limit the production of coffee, potatoes, tomatoes, corn and beans in the region, the preponderance of the pests and diseases that affect these crops and the need to regulate their use becomes clear.

The present scenario is much more urgent than in the past, because we have grown more certain about the unsustainability of the prevailing agricultural model and about the climate change taking place at a global, regional and local scale. Climate change will exacerbate the problems of pests in the region, so it is imperative to find a way to reduce losses due to the attack of pests and diseases by applying agroecological science, so we can reduce the need for and dependence on external inputs, especially pesticides.

To manage harmful organisms in coffee, potatoes, tomatoes, corn and beans, a variety of traditional and conventional methods and practices are used in the region. The adoption of these methods and practices varies from one country to another and also within the same country depending on multiple factors. These include, fundamentally, the agroecological zone in question and other elements that have to do with the preponderant agricultural focus, the local culture and the available resources.

Among the agroecological management practices in use are cultural, mechanical, physical and ethological control, mainly in small-scale peasant agriculture; and biological control, both in the small scale and in the large areas of monoculture.

The practices of cultural control are the product of observations made by farmers for millennia, so today they amount to an invaluable inheritance. This method of control is critically important in managing pests under the approach and principles proposed by agroecology. The importance of this is not as widely recognized as it should be, and its full potential for sustainable agriculture is thus unrealized, despite its potential contribution to the improvement of ecosystem services that naturally regulate pests, the biological control needed for conservation, the increase in biological diversity, the health of the soil, and the construction of resilience (the ability to prevent disasters and crises, as well as to anticipate, cushion them, take them into account or recover from them on time and in an efficient and sustainable way).

Biological control is among the main alternatives to the use of pesticides; in light of the positive results to date, its central importance in the agroecological management of pests is indisputable. This report details strategies for its implementation, placing particular weight

on the conservation of the natural enemies as the most valuable strategy for the permanent elimination of the pesticides. The report also relates successful experiences in which the application of biological control agents has reduced or eliminated HHPs in coffee, potato, tomato, corn and bean crops.

The case of Cuba stands out. There, biological control has not been applied as a separate technology, but rather is considered as part of the set of components that make up the agroecosystem and the interrelation of their components. The massive production of entomophages, entomopathogens and antagonists is a remarkable example of the sustainability of this process, in a country with very scarce financial resources. The replacement of pesticides potentially saves thousands of pesos every year in freely convertible currency that can be used to meet other needs.

The biological control agents most widely used in the region are: the parasitoid wasp *Trichogramma* spp., the bacterium *Bacillus thuringiensis*, the fungi *Beauveria* spp. and Metarhizium spp., the nematode *Heterorhabditis* spp., and the fungal antagonist *Trichoderma* spp.

Finally, the report recommends policy reviews of pesticide regulations and agroecology in Latin America and the Caribbean to identify the obstacles and incentives to reduce and progressively eliminate HHPs, achieving the goals and objectives of the Strategic Approach to International Chemicals Management (SAICM). To do so, the report further suggests that policymakers:

- review biological control policies and agroecological pest management;
- disseminate the "One Health" concept and its close relationship with the alternatives of agroecological management of pests;
- identify the methods of agroecological management of pests used in the region and pinpoint their level of knowledge and adoption; and,
- promote national plans both for the conservation and proliferation of natural enemies and for the production and use of biological control agents, with emphasis on potential reduction and elimination of HHPs.