

## Why Plant Protection Formulations (PPFs) are necessary for Indian Tea?

Growing tea in India entails a number of challenges that make the use of Plant Protection Formulations as part of integrated pest management necessary for plantations and small growers. Tea being a monoculture is known to provide habitat to a large number of pests and diseases which affect crop health and persistent infestation of which can lead to severe crop losses and consequent loss of economic viability of tea operations. The climatic conditions of the tea growing regions of India are conducive for a large number of insects and mite pests, diseases and weeds that need to be managed to protect yields and sustain the livelihoods of those working to produce a saleable product for a price that consumers are willing to pay. This document sets out some of the key reasons why PPFs are a necessary part of the production process.

**Protecting against pest burden:** Over a thousand species of arthropod pests are known to attack tea all over the world, 300 species of insects are recorded in India alone. At the same time a good number of weeds restrict the yield of tea. Crop production in India is significantly impacted by attack from wide variety of pests including red spider mite, mosquito bug, pink and purple mites, termites, red slug caterpillar, and looper caterpillar, etc. Studies show that mites can cause more than 18 per cent loss<sup>1</sup> in crop when the infestation is severe. The cumulative crop loss due to pest attacks can go as high as 55 per cent, in some cases 100 per cent crop loss has been reported<sup>2</sup>.

**Protecting against impact of weather and climate:** The yield of harvestable shoots is affected significantly by the environmental factors resulting into the loss tea yield. For example, tea production in Assam sustained 50 per cent crop loss in the first fortnight of June 2010 due to incessant rains, accompanying low temperature slowing growth of new foliage, and a devastating attack by tea mosquito bug<sup>3</sup>. PPFs can't change the weather but they can help to mitigate against the potentially devastating effects that the Indian climate has on pest growth.

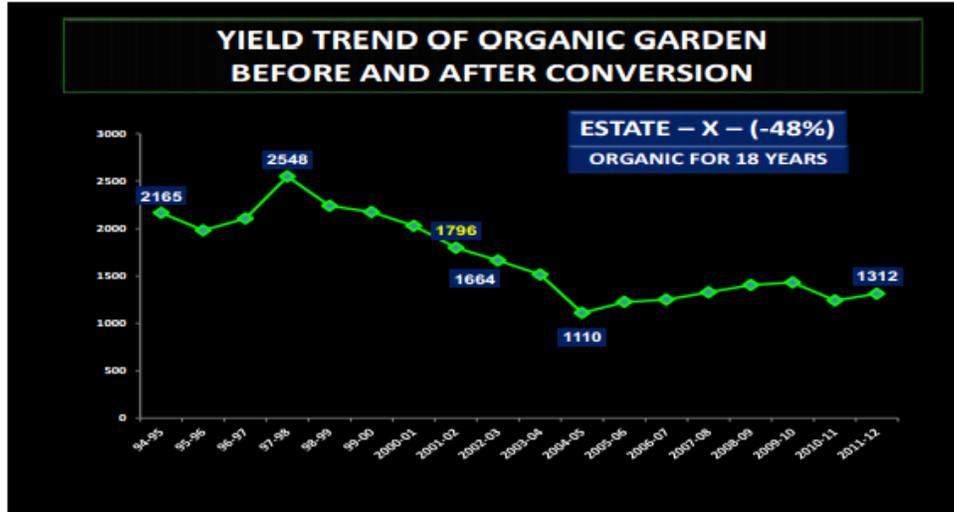
**Protecting yield:** It is important for tea growers and manufacturers to maintain the yield and quality of tea leaf production withstanding the impact of these pest attacks and adverse agro-climatic conditions to meet the demand for tea as well as for sustenance of the tea industry. Plant Protection Formulations (PPFs) protect crops and keep them healthy, thereby ensuring a high level of quality produce.

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<sup>1</sup> ['Functional and Numerical Responses of the predatory mite, Neoseiulus longispinosus, to the red spider mite, Oligonychus coffeae, infesting tea' by Rahman et al. Journal of Insect Science](#)

<sup>2</sup> ['Sustainable Pest Management in Tea: Prospects and Challenges' by RJ Rabindra, National Bureau of Agriculturally Important Insects, Indian Council for Agricultural Research](#)

<sup>3</sup> ['Present Status of Use of Agrochemical in Tea Industry of Eastern India and Future Directions' by AK Barooah, Tea Research Association, Tocklai Experimental Station; Published in Science and Culture, September –October 2011](#)



Source: Report of the Working Group on Organic Tea Intercessional Meeting of the Intergovernmental Group on Tea, FAO

**Protecting livelihood:** The highly labour intensive tea industry today employs more than 11 lakh workers engaged in various functions<sup>4</sup>. At the same time around 2 lakh small tea growers account for about 30 percent of the total annual tea production<sup>5</sup>. Additionally, more than two million people derive their livelihood from ancillary activities associated with the industry<sup>6</sup>. Proven PPFs enable the sizeable population to have a significantly greater likelihood of producing a high quality produce at volume to enable them to recover the investments they make – often at great risk.

Cost per hectare/ kg of tea in South India in INR		
Cost component	Organic	Non-organic
Total variable cost	77.66	35.41
Total fixed cost	34.15	16.62
Manufacturing cost	24.50	24.50
Overhead expenses	16.67	16.00
Total cost	152.98	92.53
% increase over non-organic	65%	

Source: Report of the Working Group on Organic Tea Intercessional Meeting of the Intergovernmental Group on Tea, FAO

Experience of organic cultivation of tea in India so far shows while conversion of plantations from non-organic to organic leads to loss of yield to the tune of 40%, at the same time

<sup>4</sup> Statistical Year Book, India 2014 by Ministry of Statistics and Programme Implementation (MSoPI)

<sup>5</sup> Confederation of Indian Small Tea Growers Association

<sup>6</sup> Department Related Parliamentary Standing Committee on Commerce 102 report on Performance of Plantations Sector – Tea and Coffee Industry

production cost goes significantly up due to increase in man days ( more than 60%) required compared to non-organic tea. At the same time price recovery is not rewarding compared to the additional effort put in as consumers are not prepared to pay more than 20 -40% and not more than 1.5 times of regular tea. In this context, the Intergovernmental Group on Tea of FAO observed that promoting IPM with greater integration of organic practices is the most economically viable option currently<sup>7</sup>.

### Why not use natural methods of pest control?

Although natural methods exist for several types of pests and diseases in India, these are insufficient for ensuring the safety of crops given the variety of the pests and the severity of the crop loss resulting from their infestation. The seasonal nature of different kinds of pests also necessitates the application of integrated pest management across different seasons<sup>8</sup>. Traditional methods to protect the crop in these conditions yielded little success. The natural techniques also face practical hurdles, for example the need for huge quantities of natural bio-resources which are not available. Plant Protection Formulations (PPF) are thus an essential input for the integrated management of tea cultivation for achieving optimum productivity under prevailing conditions.

### What is the best approach to PPF use then? How do we minimise usage?

At the same time, adoption of good agricultural practices (GAP) including integrated pest management, promotion of alternative control strategies (Biological control etc.) has been globally accepted as the way forward to ensure sustainable production of tea without adversely impacting environment and consumer safety.

**Integrated Pest Management (IPM):** The concept of IPM was introduced in India during 1970s which helped in minimising the use of PPFs. IPM is a system that utilizes all suitable methods and techniques of control in as a compatible manner as possible, to maintain pest incidence at levels below those causing economic loss of crop. This encompasses adoption of several approaches such as cultural, biological, physical and mechanical complementarily used with the use of PPFs against various pests.

**Maximum Residue Levels (MRLs):** Various international agencies like environmental protection agency (EPA), food and agricultural organization (FAO), world health organization (WHO), German Laws (GL), European, Economic Commission (EEC/EC) etc. have fixed the Maximum Residue Levels (MRL) values for tea growing countries. The Food Safety and Standards Authority of India (FSSAI) has set MRLs of approved PPFs for different crops including tea, in order to protect consumers. These take into account agricultural practices and

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<sup>7</sup> [Report of the Working Group on Organic Tea, FAO, Intercessional Meeting of the Intergovernmental Group on Tea, May 2014](#)

<sup>8</sup> [Sustainable Pest Management in Tea: Prospects and Challenges' by RJ Rabindra, National Bureau of Agriculturally Important Insects, Indian Council for Agricultural Research](#)

exposure through consumption habits. The Indian tea industry refers to these standards, and is engaged in an ongoing process to incorporate them into its own practices.

**Plant Protection Code (PPC):** While the responsible use of pesticides is strictly regulated by the Government and their use kept to a minimum, the PPC was developed by Tea Board of India as a best practice guide to tea production, setting standards jointly agreed by key stakeholders, supplementing existing regulations, such as the Food Safety and Standards Act of India 2006 and the list of products permitted for use in the tea sector by the Central Insecticides Board & Registration Committee. The PPC deals with the safe usage of crop protection products and that of methodologies to be followed to reduce pesticide residues in tea. The code encourages tea growers to critically review their use of PPFs, reduce the use of PPFs where possible and over time, apply the PPFs in the safest way possible.

**Trustea:** 'Trustea', an initiative led by Tea Board of India, which aims to sustainably transform the Indian tea industry. One of its aims includes moving towards sustainable agriculture practices, and a roadmap has been developed for this. The code encourages tea growers to critically review their use of Plant Protection Formulations (PPF), reduce their use where possible and apply them in the safest way possible. A *trustea* verified unit will not use any PPFs that have been banned by the central and state government or its affiliated bodies. This programme aims to sustainably transform 500 million Kg or 51% of Indian tea spread over 300,000 hectares by 2017. Trustea will also support the certification of 40,000 small holders who produce about 25% of Indian tea.