State of Sustainability Initiatives

Agrochemicals in Tea Production:
VSS enabling compliance with maximum residue limits

Commentary Report

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Tea Production

Discovered around 2700 BCE, tea is one of the oldest beverages in the world and is known to have many health benefits due to its antioxidant properties and antimicrobial effects (Sharangi, 2009). The UN Food Agricultural Organization's Intergovernmental Group on Tea (IGG) promotes consumer awareness of tea's health benefits (IGG, 2015).

Intensified food production techniques to meet growing global demand have often relied on agrochemicals—namely crop protection products (CPPs) and synthetic fertilizers—to manage production and deter pests and diseases (Food and Fertilizer Technology Center [FFTC], 2007; Unilever, 2010). However, health concerns associated with agrochemical residues on food products have extended to tea.

Policy-makers are faced with having to mitigate the potential human health and environmental impacts associated with agrochemical use while maintaining the socioeconomic benefits of tea production. Because tea production is labour-intensive and geographically limited to a few places around the world, this challenge is compounded by shifting climatic, socioeconomic and land-use conditions that are threatening the sector (IGG, 2015; Van der Wal, 2008).

The adoption of voluntary sustainability standards (VSSs)[1] in tea production has led to some sustainability improvements, including efforts to better manage and apply agrochemicals. For instance, a study on the effect of the Rainforest Alliance certification in Kenyan tea production suggests that labour conditions and environmental conservation have improved while living conditions and health services have not (Ochieng, Hughey, & Bigsby, 2013).

Maximum Residue Limits

Food safety standards aim to mitigate growing concerns associated with tea production (Van der Wal, 2008). Maximum residue limits (MRL) specify agrochemical residue limits on food products for human safety and environmental protection (FFTC, 2007). These limits are regulated according to importation preferences, such as the EU's Directive 2009/128/EC or producer capacity, such as India's Plant Protection Code. While MRLs are currently established in different countries to reflect their needs, conditions and capabilities, the *Codex Alimentarius*[2], set by the World Health Organization and the Food Agricultural Organization, serves as the primary international point of reference to specify limits of pesticides found in food products (in mg/kg) at either "the point of entry into a country or the point of entry into trade channels within a country" (Barry et al., 2012).

[1] Voluntary sustainability standards are non-obligatory initiatives explicitly designed to promote the objectives of sustainable development. They can include eco-labels, certification initiatives, CSR programs, business-to-business initiatives, roundtables and other collaborative or multistakeholder initiatives.

[2] The Codex Alimentarius is a collection of international food standards, guidelines and codes of practice contribute to the safety, quality and fairness of this international food trade. It is non-mandatory in nature and related texts have since 1995 become international benchmarks for harmonization under the agreements of the World Trade Organization. Currently there are 182 member countries that are participating and are encouraged to maintain these standards or higher based on the results of risk assessments of the respective countries. The Codex MRLs for Tea, Green, Black (black, fermented and dried) are laid out in codes DT 1114, DT 1116 and DT 0171 (FAO & WHOs, n.d.a).

MRLs have gained importance in food safety and trade dynamics as they have recently become more rigid in many countries (IGG, 2015). As shown in Figure 1 below, Chinese tea exports to France, Poland, the United Kingdom and the Netherlands dropped significantly over the last decades partly due to increasing pesticides used for tea production and stricter MRL regulations. Germany's importation of Chinese tea continued to increase over the reporting period partly due to a steady increase in organic tea consumption.

Food safety programs must address agrochemical management to the set MRLs that lower risks to human health and the environment while effectively targeting pests (FFTC, 2007). Establishing inspection systems and developing analytical methods for agrochemical residues have become necessary to ensure compliance (FFTC, 2007). Vital to minimize compliance and trade issues, unifying MRLs among trading countries remains challenging due to legislative gaps, trade barriers and country-specific conditions.

For tea, the matter becomes more complicated since MRLs are regulated based on agrochemical residues found on dried leaves as opposed to tea infusions, the form under which tea is consumed (IGG, 2014).To address this limitation, the IGG examined a broad range of pesticide residues and their concentrations found in brewed black and green tea to ascertain their potential impact on human health. The IGG determined that consuming 13 grams of green tea per day by a 60 kg adult results in 0.025 to 14 per cent of the acceptable daily intake of various pesticides (IGG, 2014). For this reason, tea MRLs do not currently capture the potential impact of agrochemical residues on human health.

Worker Health & Safety

Whereas tea production is a key source of employment and income in a number of developing countries, worker wages, income stability and health impacts from agrochemicals are a few of the many concerns regarding worker conditions (Van der Wal, 2008). Health and safety issues have risen in the past decades largely due to a lack of agrochemical training among tea farmers and particularly small tea growers (STGs) (Van der Wal, 2008). International Labour Organization (ILO) studies have revealed that respiratory and water-borne diseases account for 60 to 70 per cent of the health issues affecting tea plantation workers (Sivaram, 1996; Van der Wal, 2008).

In India over 2.5 million families are estimated to be employed formally and informally in tea production (Van der Wal, 2008). The Tea Board of India maintains that Indian tea is subject to some of the most stringent standards globally. MRLs are in place, and 37 chemicals have been identified as permissible for use in Indian tea production in the Plant Protection Code[3] (Dutta, 2014). Despite these measures, Greenpeace reports that levels of pesticide residues found in tea samples from China and India were disturbingly above the safe limits set by the World Health Organization (Greenpeace, 2014). It is clear that action on the proper use and application of agrochemicals is needed to ensure safety for human health and the environment in the tea-growing regions of India.

Did you know?

India has become the fourth-largest tea exporter in the world with the northeastern state of Assam producing almost half of the country's tea. Tea production in the state has become the primary source of income for many small growers. However, health and environmental safety are issues that need immediate attention since farmers continue to use banned agrochemicals due to a lack of training and support.

The excessive use of agrochemicals has not affected trade despite final production often exceeding MRLs. A study on the Golaghat District of Assam determined that 95 per cent of small tea growers use pesticides often with little knowledge of their safe handling, storing and application. Visible symptoms associated with agrochemical overexposure have been observed which correlate with the lack of protection and safety measures adopted by the farmers in the District. Small tea growers are in need of assistance to use agrochemicals more safely so as not to exceed MRLs.

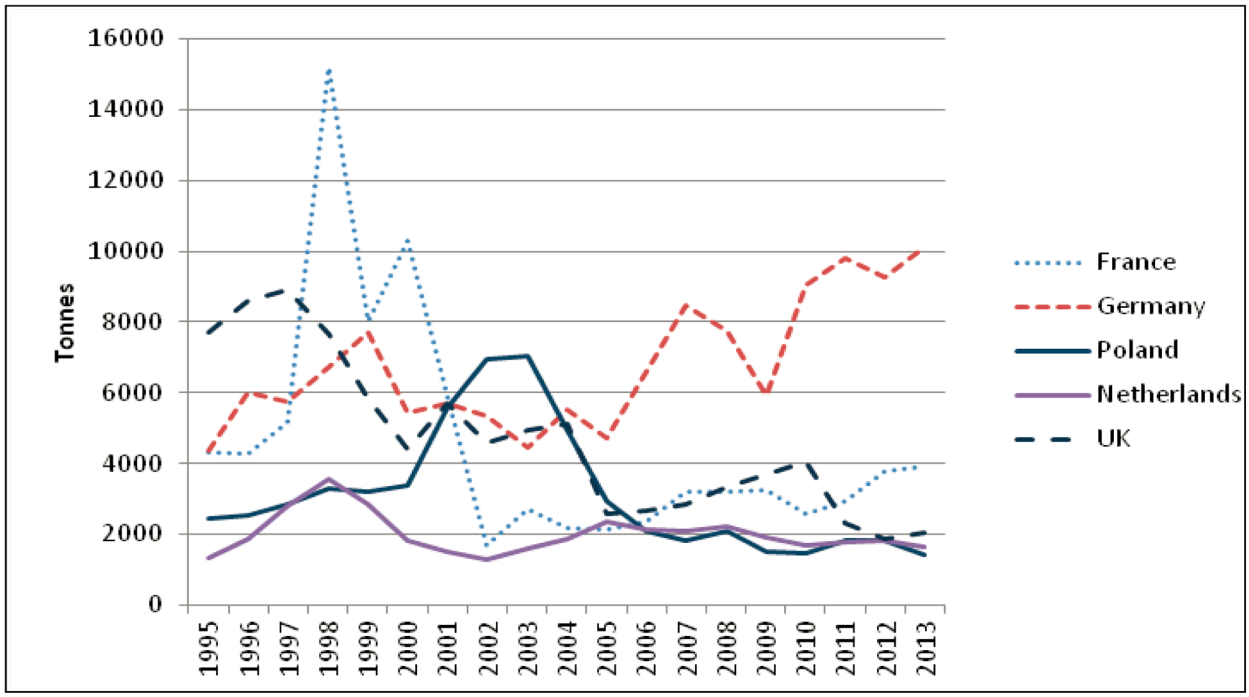
Sources: Gogoi, Yadav, Gogoi, & Borah (2015); Dey, Choudhury, & Dutta (2013).

Voluntary Sustainability Standards and Agrochemicals

A number of voluntary sustainability standards (VSS) have been developed for tea production. Some of the most internationally recognized ones include the Ethical Tea Partnership (ETP), Fairtrade, Rainforest Alliance, UTZ Certified and Organic. Country-specific standards also exist to allow for more context-relevant sustainable production measures. An example of this is the Trustea code and certification, which created India-specific principles by referencing global VSS such as ETP, Rainforest Alliance and UTZ Certified.

[3] The Plant Protection Code (PPC)—a set of guidelines for regulating the chemical inputs in tea cultivation in India—was rolled out on January 1, 2015 (Dutta, 2014).

Figure1: Chinese tea exports to France, Germany, Poland, Netherlands and the United Kingdom.



Source: FAO, 2015

VSS agrochemical provisions for sustainable tea production usually consist of 1) banning, prohibiting or phasing out certain types of agrochemicals, 2) training for workers to ensure the proper handling, storage, application and disposal of agrochemicals, 3) record keeping to maintain transparency associated with agrochemical application and 4) promoting alternative methods to reduce the need for agrochemicals. Tracking the rate at which agrochemical use is changing is imperative to assess their efficacy in meeting MRLs.

The Ethical Tea Partnership and Rainforest Alliance also require producers to work toward phasing out the use of WHO classes Ia, Ib and II hazardous agrochemicals (ETP, 2013; Unilever, 2010). The Rainforest Alliance prohibits the use of a host of agrochemicals, including those banned or severely restricted by the U.S. EPA and the EU unless special circumstances merit an exception (SAN, 2011). Fairtrade certification has focused on reducing the use of herbicides (Elder, Zerriffi, & LeBillon, 2013). Organic Certifications such as that by the U.K. Soil Association restricts chemical use for pest control purposes, recognizing that a principle of organic production aims to avoid the use of agrochemicals altogether (Soil Association, 2015).

Recent discussions on the future of sustainable tea production acknowledged the need to address further the pesticide use and MRLs challenge. The TEAM UP event collaboratively hosted by the Ethical Tea Partnership (ETP) and the Sustainable Trade Initiative (IDH) in London from June 16–17, 2015, focused on addressing an important question: How can producers be more effectively supported in managing pesticide use to meet local and export market regulations? The question inspired the participants to discuss the following:

- Supporting smallholders in managing and using agrochemicals.
- Collaborating to develop approaches for addressing agrochemical issues.
- Preventing the misuse of agrochemicals and developing agrochemicals tailored for tea production.
- Undertaking research on agrochemical management for tea production.
- Establishing a joint committee managed by governments, NGOs, and producers focused on improving agrochemicals management and regulation in tea cultivation.

The participants concluded that ETP establishes a working group as a first step toward addressing agrochemical issues in the tea industry.

Production Compliance with Maximum Residual Limits

The complexity of international pesticide regulations has resulted in legislative compliance challenges in the global tea trade. Steps toward harmonizing MRLs in tea could potentially address these difficulties. Research aimed toward developing MRLs for tea infusions as opposed to dry tea could prove beneficial for tea-producing countries aiming to remain compliant.

VSSs provide guidance and capacity building for farmers to adopt a more sustainable approach to the management and use of agrochemicals to respect MRLs recognized by the FAO as more effective than trade barriers, as they are directly linked to production methods (Dutta, 2014). Although adherence to VSS-enabling MRLs compliance should lead to improved market access, VSSs can also function as non-trade barriers given that additional costs associated with standard-compliant production do not always lead to higher earnings or market share for farmers (Van der Wal, 2008).

As VSSs become more stringent to meet consumer demands, prices can be expected to rise and become more volatile (Dutta, 2014). The FAO (2015) reports that a 10 per cent increase in retail prices will reduce demand by 3.2–8 per cent in black tea and 6.9–10 per cent in the case of green tea. Stringent VSSs requiring traceability of agrochemicals throughout the tea chain of custody could exclude tea producers unable to meet this requirement (Van der Wal, 2008). The lack of harmonization of VSSs is another challenge for farmers to manage, as some incur additional production costs by pursuing more than one VSS to cater to varying consumer demands (Davis de Andrade Lessa, 2014). Without more inclusive measures for smaller producers, larger producers can be expected to be more competitive in markets that demand MRL-compliant tea.

VSSs offer an approach to reduce agrochemical use to meet MRLs for tea. To do so, VSSs should introduce MRL-specific parameters, assist small tea growers meet their standards and enable cooperation among tea supply chain stakeholders. Introducing MRL-specific parameters could help farmers reduce their agrochemical use. Small tea growers are prone to misusing agrochemicals due to a lack of training, and assisting them represents an important opportunity to reduce agrochemical use in the sector. VSSs are well placed to strengthen cooperation for MRL-compliant tea production among tea producers, importers, traders, boards, associations and others since they are typically represented in their membership who regularly discuss sustainability issues faced by the sector.

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