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Indicators of Health Risks to Promote Sustainability in Agro-Food Chains

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Objective:

Techniques to identify potential health risks of pesticide use are useful to promote and follow up sustainability in export agro-food chains, especially in production segment in developing countries. The aim of the study was to differentiate crop production technologies, based on the quantity of pesticides applied, grouped by toxicity criteria as health risk indicators.

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Materials and Methods:

Surveys were carried out on pesticide use among 161 producers of export crops in Costa Rica (coffee, melon, chayote) and Guatemala (coffee, snow peas) using convenience samples. Active ingredients were classified and grouped by acute, topical, and chronic toxicity. Risk indicators were quantities of pesticides used by different toxicity criteria for kg of product on the consumer table. The ratio between indicators pointed towards the sustainability of different technologies as selected by agricultural economists. For the consumer segment of the chain, EPA and EU residues on the export crops were analyzed according to toxicity criteria.

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Results:

In Costa Rica, all risk indicators were lower for coffee from Santa Maria de Dota than San Marcos de Dota; acute and topical risks were lower for independent chayote growers than for organized growers; acute and chronic risks were higher and topical risks lower for melon produced with methyl bromide as compared to metam sodium. In Guatemala, risks for certified coffee were lower than for conventionally grown coffee; topical risks were lower for snow peas exported to the US than to the EU. Residues suggest some potential risks for consumers for (1) snow peas: acute (methamidophos) and chronic (chlorothalonil and methamidophos), and (2) melon: acute (endosulfan and methomyl) and chronic (endosulfan, methomyl, tiabendazol).

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Conclusions:

Quantities applied of pesticides grouped by toxicity indicators may help identify and promote sustainability in

export food chains. Pesticide residues in imported foods are not promising as sustainability indicators for the consumer segment of agro-food chains.