



# ORGANIC FOOD AND PESTICIDE RESIDUES IN BRAZIL

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“Organics products” stated by Brazilian legislation is vegetable and animal products *in natura* and/or processed; produced in an organic system;

“Organic products” to be commercialized should have certification from organizations accredited by Agricultural Ministry (MAPA);

• <http://www.agricultura.gov.br/assuntos/sustentabilidade/organicos>



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- In the nineties MAPA have stated some standards normative for organic production;
- The document supplies details for organic production;
- The production must be without use of pesticides or any artificial and toxically chemicals.
- Farm from EMBRAPA – Agricultural Agency
- Agricultural Plan from MAPA



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- The MAPA accredited some agencies to certify the farmers and their products;
- Nowadays there are 15,000 farms certified by some of these agencies;
- They are familiar properties (75%);
- Southeast area is the biggest;
- The standards procedure pointed safe production, means, no risk for the consumers health and environmental protection;



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- Organic products mostly exported to European Community, USA and China are: coffee, cacao, soybean, sugar, orange juice, some oils, dry fruits, cashew nuts and guarana;
- Brazil is the strongest consumer of organic products in Latin America;
- The price is around 30% higher than conventional products



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## Pesticides

- soybean, corn and sugar cane correspond to 63%, 13% and 5% of the total consumption respectively;
- tabaco>cotton>citrus>tomato>soybean>grape>banana>rice>wheat>papaya>corn>sunflower represent the most importante use;
- Glyfosate, **chlorpyrifos**, 2,4D, atrazine, mineral oil, mancozeb, metoxifenozone, **acephate**, haloxifop-P-ethyl, lactofen, metomyl, diquat, **pyraclostrobin**, flumetsulan, teflubenzurom, **imidacloprid**, cyhalothrin lambda, imazetapir, azoxistrobin and flutriafol the most frequently employed;



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- 42 samples were evaluated by LRP: banana, bean, cabbage, carrot, cauli, cucumber, eggplant, lettuce, lime, parsley, potato, strawberry, sugar beet, sweet potato, sweet pepper, tomato and zucchini;
- Multiresidue methods were employed (liquid-liquid extraction for high pigments content and QuEChers method);
- Identification and quantification were made by conventional detectors and mass spectrometry;
- 35% of the samples were positive (at or below LOQ) for pesticide residues;
- Multiple findings were observed in 9.5% of the samples (carrot, eggplant, potato and zucchini);

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## RESULTS

Pesticide	Sample/mg/kg	MRL/mg/kg
Acephate	Carrot 0.2 Potato 0.01	NPC 0.1
Bifenthrin	Eggplant 0.002 Zucchini 0.001	NPC NPC
Captan	Carrot 0.005 Sweet potato 0.3	NPC NPC
Chlorpyrifos	Carrot 0.13 Carrot 0.2 Potato 0.02	NPC NPC 1.0

NPC – not permitted for the crop

MRL – Maximum Residue Level established for conventional food



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## RESULTS

Pesticide	Sample/mg/kg	MRL/mg/kg
DDT	Carrot 0.001	NPC
Epoxiconazole	Eggplant 0.01 Zucchini 0.001	NPC NPC
Fipronil	Sweet pepper 0.04	NPC
Imazalil	Carrot 0.13	NPC
Imidacloprid	Tomato 0.01	0.5
Kresoxin-methyl	Parsley 0.005 Lettuce 0.005	NPC NPC

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## RESULTS

Pesticide	Sample/mg/kg	MRL/mg/kg
Methamidophos	Carrot 0.03 Potato 0.01	NPC 0.1
Metalaxyl	Tomato 0.005	0.05
Propiconazole	Eggplant 0.001	NPC
Pyraclostrobin	Tomato 0.03	0.2
Pyrethrins	Carrot 0.005	NPC

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- Pesticides found in the organic samples: mostly are insecticides and fungicides;
- All of them with Maximum Residue Limits established for fruits and vegetables;
- DDT and metabolites are environmental contaminants;
- Fipronil is used to control ants
- Pyrethrins are used as domestic protection or gardens.

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- Acephate and methamidophos for monitoring analysis were evaluated together until last year (2017) and the level of methamidophos should be  $< 0.01$  mg/kg;
- bifenthrin, imidacloprid, kresoxin-methyl and pyraclostrobin have MRL for several minor crops;
- The positive results for pesticides could be attributed to their use or environment contamination;
- The poor knowledge of the farmers and majority are family groups they are vulnerable to the great producers and pesticide companies.





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Thank you  
Grazie

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Acknowledgements to Agricultural Ministry

