

Agrotoxins: new and old challenges for collective health

Agrotóxicos: nuevos y viejos desafíos para la salud colectiva

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The mechanisms for exploiting nature and human beings and the consequences they bring to health and the environment are recurrent issues of perpetual importance. Nonetheless, despite all the evidence of their detrimental effects, the public health problems derived from the use of agrotoxins increase at an unsustainable rate, especially in Latin America. The monopolistic and export-oriented production of agricultural commodities, based in a model dependent on chemicals and biotechnology, has heightened this noxious policy to intolerable levels.

Agribusiness has installed itself in our countries, corrupting our political, economic, and social structures. Brazil, for example, has been the largest consumer of agrotoxins worldwide since 2009: the country purchases 84% of all agrotoxins sold to Latin America (1). The major companies manufacturing these poisons, such as BASF, Bayer, Syngenta/AstraZeneca/Novartis, DuPont, Monsanto and Dow, established themselves in the country thanks to a policy aimed at protecting the interests of agribusiness and the ruralist seats in the Brazilian Parliament. Those occupying these seats paradoxically support a government that had proposed structural changes such as agrarian reform, changes which have thus far never been implemented. By way of their companies, the US, Switzerland and Germany jointly control 70% of agrotoxin sales to Brazil (1). Worldwide sales of agrotoxins (in dollars) increased by 53.8% between 1990 and 2008 (1).

In 1976, during the military dictatorship, the National Policy of Agricultural Protection was launched in Brazil. This policy forced farmers to use part of their rural credit for the compulsive purchasing of poisons. Rapidly, in less than 40 years, the hegemony of an agrotoxin-dependent production was established. In the present, only the movements that support agroecology and organic agriculture fight to keep alive the ancient knowledge of agricultural production, seeking to protect the soil, the water, the biodiversity and the culture of rural communities in relation to the climate and the improvement of seeds.

There exists a true state of exception involving the legal-institutional framework that sustains the abusive practices of agribusiness. Although some specific rights and laws regulating the production and consumption of agrotoxins have been gained, the wide variety of amendments made to the legislation render them ineffective, undermining the legal institutions and making the practical application of the laws more flexible (2).

The enormous scale of present-day monopolistic agricultural production also comes at the cost of intensive hydroenergetic inputs, expansion over protected natural areas, the destruction of family farming and the expulsion of rural populations. This context has brought about a situation never before experienced.

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The technoscience developed with public resources in our universities and research institutes puts itself at the service of the capitalist accumulation of agribusiness. The same happens with professional training, under the belief (ideology) that production without these chemical and biotechnological inputs is impossible.

We can clearly see how social reproduction and health are related in that unsustainable production model. For thousands of years, agriculture has been favorable to life, creating a balance between biodiversity and the human need for food. The use of biocides developed during the First and Second World War, especially since the 1970s, was sanctioned by an ideological discourse regarding the need for a technological resource to put the problems of hunger to an end, originating within a globalizing economic model of agriculture known as the "Green Revolution." That same discourse is currently used to defend the use of transgenic biotechnology within the production of agricultural commodities for the food industry, the manufacturing of agrofuels, and the seed monopoly (3).

A more recent threat is the use of industrial wastes contaminated by heavy metals for the production of micronutrients used in agriculture. As hard as it may seem to believe, this is a real threat in Brazil; a resolution will soon be published by the Ministry of Environment establishing the acceptable tolerance levels of pollutants in these wastes in order for them to be used in the production of agricultural fertilizers (4).

The presence of agrottoxins has been detected in surface water, groundwater, rainwater (5,6), in the atmosphere and in areas far from agricultural zones (7,8). Agrottoxins have even been found in Arctic snow (9) and in ocean fog (10).

In the main region in Brazil (Mato Grosso) where transgenic soy is produced – with the intensive use of the herbicide glyphosate, among other agrottoxins – serious contamination has been found in humans and in the environment. In that area there are increasing concerns about the contamination of the largest groundwater reserve in South America: the Guaraní Aquifer, located at the borders of Brazil, Paraguay, Uruguay and Argentina. A study carried out in different water sources emanating from this aquifer showed agrottoxin contamination (11). In a recent study conducted in the Universidade Federal de Mato Grosso, agrottoxin residues were also found in breast milk (12).

The aerial spraying of herbicides using planes contaminates cities and harms the vegetable production of small farmers. Such is the case of the city of Lucas do Rio Verde, in Mato Grosso, Brazil (6).

Although we are facing a context adverse to human life, the public health system is not acting firmly enough to place vulnerable populations affected by these technologies under epidemiological surveillance. This fact provides clear proof that even public health is subjected to the mandates of a development model oriented towards capitalist accumulation (13).

There is still significant underrecording of the number of cases of acute and chronic intoxications due to agrottoxin exposure. In most medical schools, the diagnosis, treatment and monitoring of these damages are not taught, and little is done by the systems of epidemiological surveillance to improve the detection and research of these grievances. Neither are they taken into account in other levels of care and other areas of health in order to incorporate them into health promotion and protection measures.

The lack of concern on the part of most Latin American public health systems regarding the sanitary and ecological problems derived from the use of agrottoxins is not limited to agriculture production, food safety and the quality of water for human consumption. It also extends to the abusive use of public health itself in the control of vector-spread endemic diseases.

We have identified a series of unjustifiable errors, for example, in the way the dengue vector (*Aedes aegypti*) is controlled. In spite of the massive use of organophosphorus and other biocides, and of the endemicity of the disease along with recurrent epidemic outbreaks, the expansion of the vector is clear proof of the inefficacy of the numerous programs that follow a colonialist doctrine which views our territories as "tropical," providing yet another excuse to apply the very same model used in agriculture for the "control" of pests. A model which does not contemplate the ecosystem dynamics involved among the virus, the vector and the ways of life of human beings (14).

A recent review of the records of eleven agrottoxins with prohibitively harmful effects (mutagenicity, carcinogenicity, effects on the reproductive and endocrine systems and on the development of embryos)

demonstrated the fragility of the studies conducted by the interested companies, which are based on experimental testing in animals and seek to determine effect indicators so as to then extrapolate them to humans by means of a constant value. Apart from the methodological flaws detected, we can see how inadequate such models are, given that they do not consider, among other conditioning factors, the differences and specificities of each species and the interactions among the different substances and situations present in the ways of life, the production and the consumption of human beings (15).

The published epidemiological studies are insufficient; generally, they are cross-sectional, as such studies are less expensive and researchers do not have the economic support they need to carry out cohort studies. These studies exclude the elements of social reproduction in macro and microcontexts, providing results that have little applicability in terms of the social determination that Breilh (16), Samaja (17) and Castellanos (18) have taught us.

The scientific model used hegemonically by agricultural and health sciences continues with this reductionist view, and the policies created by these sciences disregard the uncertainty and complexity of the processes involved in the interactions among these hybrid objects of nature and culture.

With a research model reduced to linear cause-and-effect relationships, and whose results only benefit monopolistic capital, environmental injustices are produced which violate populations' rights to a healthy life and environment.

Recent participatory research studies with a complex constructivist epistemological basis have empowered social movements in the fight against the morbidogenic model of agricultural modernization (19).

The field of collective health has been seriously committed to this cause, putting into evidence the vulnerabilities, the damages to health and the social inequalities related to the chemical and biotechnology-dependent agricultural model. Collective health has furthermore produced a profound critique of the scientific model underlying policy decisions, especially public health policies, and has proposed other study models which consider the complexity of collective health issues and the preventive actions for the protection of health.

BIBLIOGRAPHIC REFERENCES

1. Pelaez V. Monitoramento do mercado de agrotóxicos [internet]. Brasília: Agência Nacional de vigilância Sanitária; 2010 [cited 31 Jul 2011]. Available from: http://portal.anvisa.gov.br/wps/wcm/connect/c4bdf280474591ae99b1dd3fbc4c6735/estudo_monitoramento.pdf?MOD=AJPERES
2. Maciel KLS. O uso de venenos na agricultura: a judicialização do conflito ambiental. [Dissertação de Mestrado]. Recife. Universidade Federal de Pernambuco; 2012.
3. Camara MCC. Regulamentação e atuação do Governo e do Congresso Nacional sobre os alimentos transgênicos no Brasil: uma questão de (in)segurança alimentar. [Tese de Doutorado]. Rio de Janeiro: Escola Nacional de Saúde Pública, FIOCRUZ; 2012.
4. Brasil, Ministerio do Meio Ambiente. Processo N° 02000.002955/2004-69. Uso de resíduos industriais indicados como matéria-prima para fabricação de produtos fornecedores de micronutrientes utilizados como insumo agrícola [Internet]. 2012 [cited 7 Mar 2012]. Available from: <http://www.mma.gov.br/port/conama/proces-so.cfm?processo=02000.002955/2004-69>
5. Funari E, Donati L, Sandroni D, Vighi M. Pesticide levels in ground water: value and limitations of monitoring. In: Vighi M, Funaru E, editors. Pesticide risk in groundwater. Boca Raton: CRC Press; 1995. p. 3-44.
6. Pignatti WA, Machado JMH, Cabral JF. Acidente rural ampliado: o caso das "chuvas" de agrotóxicos sobre a cidade de Lucas do Rio Verde MT. *Ciência & Saúde Coletiva*. 2007;12(1):105-114.
7. Grover R, Wolt JD, Cessna AJ, Schiefer HB. Environmental fate of trifluralin. *Reviews of Environmental Contamination & Toxicology*. 1997;153:1-64.
8. Laabs V, Amelung W, Pinto A, Wantzen M, Silva CJ, Zech W. Pesticides in surface water, sediment, and rainfall of the Northeastern Pantanal basin, Brazil. *Journal of Environmental Quality*. 2002;31(5):1636-1648.

9. Gregor DJ, Gummer WD. Evidence of atmospheric transport and deposition of organochlorine pesticides and polychlorinated biphenyls in Canadian arctic snow. *Environmental Science & Technology*. 1989;23(5):561-565.
10. Schomburg CJ, Glotfelty DE. Pesticide occurrence and distribution in fog collected near Monterey, California. *Environmental Science & Technology*. 1991;25(1):155-160.
11. Estudo mostra que o Aquífero Guarani está contaminado por agrotóxicos. *Novoeste online* [Internet]. 19 May 2011 [cited 9 Mar 2011]. Available from: <http://www.novoeste.com/pages/news/pdf.php?id=4464>
12. Palma DCA. Agrotóxicos em leite de mães residentes em Lucas do Rio Verde-MT. [Dissertação de Mestrado]. Cuiabá: Instituto de Saúde Coletiva, Universidade Federal de Mato Grosso; 2011.
13. Bombardi LM. Intoxicação e morte por agrotóxicos no Brasil: a nova versão do capitalismo oligopolizado. *Boletim DATALUTA* [Internet] 2011 [cited 9 Mar 2012];sep. Available from: http://www2.fct.unesp.br/nera/artigodomes/9artigodomes_2011.pdf
14. Augusto LGS, Carneiro RM, Martins PH. Abordagem ecossistêmica em saúde: Ensaios para o controle de dengue. Recife: Editora Universitária; 2004.
15. Augusto LGS, Gurgel AM, Bedor CNG, Gurgel IGD, Friedrich K, Mello MSC, Siqueira MT. O contexto de vulnerabilidade e de nocividade do uso dos agrotóxicos para o meio ambiente e a importância para a saúde humana. In: Rigotto R. *Agrotóxicos, trabalho e saúde: Vulnerabilidade e resistência no contexto da modernização agrícola no Baixo Jaguaribe/CE*. Fortaleza: Edições UFC; 2011. p. 257-272.
16. Breilh J. *Epidemiología crítica: ciencia emancipadora e interculturalidad*. Buenos Aires: Lugar Editorial; 2003.
17. Samaja JA. *Reprodução social e a saúde: elementos metodológicos sobre a questão das relações entre saúde e condições de vida*. Salvador: Casa da Qualidade, ISC, UFBA; 2000.
18. Castellanos PL. Sobre el concepto de salud-enfermedad: Descripción y explicación de la situación de salud. *Boletín Epidemiológico*. 1990;10(4):1-7.
19. Rigotto R. *Agrotóxicos, trabalho e saúde. Vulnerabilidade e resistência no contexto da modernização agrícola no Baixo Jaguaribe/CE*. Fortaleza: Edições UFC; 2011.

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