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Comparative Analysis of Pesticide Regulatory Programs in the United States and Brazil

by

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Comparative Analysis of Pesticide Regulatory Programs in the United States and Brazil

JOHN C. TUCKER* AND MARK A. BROWN**

I. INTRODUCTION

Pesticide poisoning is a global problem common to both the United States and Brazil. In 1972, the World Health Organization (WHO) estimated that approximately five hundred thousand incidents of pesticide poisoning occurred worldwide each year.[1] By 1990, WHO estimated that pesticide poisonings had increased substantially, to as many as two million incidents each year, resulting in forty thousand fatalities.[2] The dramatic increase in worldwide pesticide poisonings during the past eighteen years is troubling, particularly in light of the substantial gains made in

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1. Giles Forget, *Pesticides and the Third World*, 32 J. TOXICOLOGY ENVTL. HEALTH 11, 13 (1991).

2. *Id.*

pesticide safety during this same period in the United States. The high rate of worldwide pesticide poisonings reflects an increased use of pesticides in developing countries, without concurrent developments in pesticide or safety and education programs.[3]

This Article is based on a broader comparative study of environmental and land use laws and policies of the states of Florida and Paraná, Brazil, conducted by the University of Florida and other organizations.[4] The study focused on Florida and Paraná because the two regions share many attributes.[5] For example, both states have a substantial agricultural industry that relies heavily on the use of pesticides to control insects.[6] Climatic conditions are alike in both states, and both employ seasonal migrant workers and have relatively high populations.[7] Additionally, the states have taken similar approaches to regulating pesticides.[8] Yet, despite the numerous similarities between the two states, pesticide-related poisonings in Paraná far exceed those in Florida.[9]

A comparative study of pesticide regulatory programs in the United States and Brazil provides a useful tool to evaluate and

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3. Mark A. Kablack, Note, *Pesticide Abuses in Third World Countries and a Model for Reform*, 11 B.C. THIRD WORLD L.J. 277, 279, 283-84 (1991).

4. During 1992 and 1993, the Center for Governmental Responsibility of the University of Florida College of Law conducted the project, entitled the "Florida/Paraná Collaborative Research and Training Program in Environmental Administration and Protection," in conjunction with the Florida/Brazil Institute and the Center for Latin American Studies of the University of Florida, the Division of Development Operations of the Bank of Paraná, the Public Prosecutor's Office of the Department of Justice of Paraná, and the Catholic University of Paraná. The North South Center at the University of Miami funded the project. The findings of the project were presented at a conference entitled *The Environment—Legislation, Management, and Sustainable Development*, held at Pontífica Universidade Católica do Paraná in Curitiba, Paraná (Brazil). Strategies for Environmental and Land Use Policy Development: A Case Study of Florida (U.S.A.) and Paraná (Brazil) (John Tucker et al. eds., 1993) (unpublished conference proceedings on file at the Center for Governmental Responsibility, University of Florida College of Law, Gainesville, Florida) [hereinafter Strategies]. The State University of Maringá, Paraná, Brazil, is also publishing the proceedings in Portuguese.

5. JoAnn Klein et al., Introduction, *in* Strategies, *supra* note 4, at 1-2.

6. *Id.*

7. *Id.*

8. *See infra* part IV.

9. In 1991, Paraná reported 1187 pesticide poisonings and 101 deaths. *See infra* note 19 and accompanying table. By contrast, Florida reported only 5 poisonings in 1994 and no pesticide related deaths. Telephone Interview with Dennis Culligan, Florida Department of Agriculture and Consumer Services (Mar. 29, 1995). Poisonings in both states are probably underreported.

improve both countries' programs. An analysis of U.S. and Brazilian pesticide regulatory programs reveals strikingly similar procedural and substantive criteria. For example, both countries require the registration of pesticides according to established registration standards and the printing of instructions for use on pesticide containers.[10] Additionally, both provide for the suspension and cancellation of pesticide registration.[11] Yet, as mentioned above, the programs yield disparate results due to Brazil's lack of access to information regarding pesticide risks and inadequate user education and training.

As a major exporter of pesticides to Brazil, the United States could play a key role in reducing pesticide poisonings and fatalities in Brazil. U.S. pesticide export policy affects pesticide availability and use in importing countries such as Brazil. Critics admonish the United States for allowing sales to foreign countries of pesticides that are not registered for use in the United States.[12] Further, U.S. export policy often has failed to provide importing countries with adequate information regarding the health and environmental risks of exported pesticides.[13] In 1993, the U.S. Environmental Protection Agency (EPA) issued a new policy statement and regulations on pesticide exports from the United States.[14] While the policy still allows the export of pesticides that the United States has banned from domestic sale, it should provide importers with more information regarding pesticide risks.[15]

Although both countries' pesticide use causes environmental hazards, it also provides economic benefits. This Article analyzes relevant laws regulating the sale and use of pesticides in the United States and Brazil and their impact on pesticide poisonings and fatalities. Part II presents a background of conditions existing

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10. 7 U.S.C. § 136 (1994); Brazil Law No. 7802 (July 11, 1989), *reprinted in* 53 LEX COLETÂNEA DE LEGISLAÇÃO E JURISPRUDÊNCIA 541 (1989). *See infra* part III.A.C.

11. *Id.*

12. *See generally* Alice Crowe, *Breaking the Circle of Poison: EPA's Enforcement of Current FIFRA Export Requirements*, 4 GEO. INT'L ENVTL. L. REV. 319 (1992); Kristina L. Baird, Note, *No More Excuses: Adopt the "Circle of Poison Prevention Act of 1991,"* 21 CAP. U. L. REV. 963 (1992); Kablack, *supra* note 3.

13. Crowe, *supra* note 12, at 322 (discussing nine administrative cases the EPA filed in 1990 seeking penalties from U.S. pesticide manufacturers for failure to comply with U.S. notification and labeling requirements for pesticide exports).

14. Pesticide Export Policy, 58 Fed. Reg. 9062 (1993) (to be codified at 40 C.F.R. §§ 168-69).

15. *See infra* notes 149-159 and accompanying text.

in Brazil that affect the country's ability to regulate pesticides. Part III examines federal regulation of pesticides in both countries, and Part IV examines each country's state regulation of pesticides, using the states of Florida and Paraná as examples. Part V examines the impact of U.S. pesticide export policy on pesticide use and regulation in Brazil. Part VI suggests areas for reform that could greatly reduce pesticide poisoning. The Article concludes in Part VII that the most pressing problem facing regulators and citizens in Brazil is the lack of information regarding the adverse impacts of pesticides. Further, improvements in the exchange of information, education, and monitoring would increase significantly the safety of pesticide use in Brazil.

II. BACKGROUND

In the state of Paraná, located in southeast Brazil, pesticide use on agricultural lands has caused substantial damage to public health.[16] During the 1970s, agricultural modernization caused the mechanization of tens of thousands of hectares of Paraná's land for grain production.[17] The constant and intensive application of chemical fertilizers, herbicides, and pesticides associated with this conversion to mechanized farming resulted in hundreds of poisonings and deaths and the contamination of water supplies.[18] The following table illustrates reported poisonings, deaths caused by pesticides, and pesticide related suicide deaths during the period from 1982 to 1991.

16. Ministério Público do Estado do Paraná, Procuradoria Geral de Justiça Promotoria de Proteção ao Meio Ambiente (unpublished compilation of data, on file with John Tucker) [hereinafter Poison Reporting Program].

17. Jon Mills et al., Environment and Economic Conflicts and Alternatives, *in* Strategies, *supra* note 4, at 85, 105.

18. Poison Reporting Program, *supra* note 16.

Poisonings & Deaths by Pesticides, Paraná 1982-1991[19]

Year	Poisonings	Deaths (Suicides)	Deaths (Total)
1982*	323	25	25
1983	1875	24	25
1984	2356	93	144
1985	1075	56	76
1986	840	55	82
1987	567	28	39
1988	534	30	45
1989	558	58	61
1990	1137	94	97
1991	1187	90	101

*August to December

The data provided through the pesticide poisoning reporting program reveal some general trends regarding pesticide poisonings in Paraná. People using pesticides to commit suicide make up a large percentage of the reported pesticide poisoning deaths, perhaps reflecting the ease with which the general population can obtain these products.[20] The number of reported poisonings decreased during the mid-1980s, then more than doubled between 1989 and 1991.[21] Pesticide poisonings occurred most often to persons twenty to thirty-five years old, thereby affecting an age group with a high reproductive capacity.[22] Pesticide poisonings occurred most often in Campo Mourão, Cornélio Procópio, Apucarana, Cascavel, and Londrina, all of which are located in the agriculturally developed northern and western regions of Paraná.[23] The crops most implicated in poisonings were cotton, corn, beans, soybeans, and coffee.[24]

19. *Id.* The Public Prosecutor's Office, Department of Justice, State of Paraná, provided this information, based on data collected through a pesticide poisoning reporting program administered by the State of Paraná.

20. Alberto F. Rahde, *The Epidemiology of Poisoning: A Monitoring Program for Developing Countries*, 34 VETERINARIAN HUM. TOXICOLOGY 261 (1992).

21. Poison Reporting Program, *supra* note 16.

22. *Id.*

23. *Id.*

24. *Id.* During the agricultural harvest of 1983, the Paraná Secretary of Agriculture reported that the principal causes of pesticide poisonings and deaths included products

Brazil and the state of Paraná have made substantial gains in regulating pesticides during the past fifteen years. In 1983 and 1989, the passage of Paraná Law Number 7827[25] and Brazil Law Number 7802,[26] respectively, represented significant progress in the development of a comprehensive pesticide regulatory program in Paraná. In addition, the pesticide poisoning reporting program has provided state officials with an improved understanding of the extent of the pesticide poisoning problem. Despite these advances, however, a number of obstacles continue to thwart effective regulation of pesticides in Brazil and Paraná.

The scope of the pesticide poisoning problem extends far beyond the official estimates of poisonings and deaths. A lack of reporting and record-keeping leads to underestimation of the actual incidence rate of pesticide poisonings.[27] In Brazil, for example, the National System of Poison Information[28] covers only sixty percent of the population, and its data only represents cases reported to Poison Control Centers for consultation, treatment, or supply of antidotes.[29] Without full information, it is difficult for Brazilian authorities to regulate pesticides in all areas of the country.

Further, Brazil's system of reporting and record keeping is likely to account for only acute cases of pesticide poisoning or those exhibiting a classic symptomatology.[30] Occupational exposure to pesticides can result in subacute and chronic illnesses that are often difficult to diagnose.[31] Thus, officials also may

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such as Endrex 20 (Shell), Disyton (Bayer), Nuvacron 400 (Ciba Geigy), and Gramozone (ICI). Aloísio Surgkik, *A Destruição do Homem pela Ganância do Poder Econômico*, 21 REVISTA DA FACULDADE DE DIREITO DA UNIVERSIDADE FEDERAL DO PARANÁ 21, 22-28 (1983-1984).

25. Paraná Law No. 7827, art. 9 (Dec. 29, 1983), *reprinted in* COLETÂNEA DE LEGISLAÇÃO AMBIENTAL, FEDERAL ESTADUAL, GOVERNO DO ESTADO DO PARANÁ, SECRETARIA DE ESTADO DO DESENVOLVIMENTO URBANO E DO MEIO AMBIENTE (1990).

26. Brazil Law No. 7802, *supra* note 10.

27. Surgkik, *supra* note 24, at 21; Forget, *supra* note 1, at 13.

28. The National System of Poison Information is a network of Poison Control Centers that provides data on pesticide poisonings. Rahde, *supra* note 20, at 262 (citing and criticizing R. S. Levine, Assessment of Mortality and Morbidity Due to Unintentional Pesticide Poisonings (1985) (unpublished WHO document, PDS/PP85/WP.1)). Another source of data for pesticide poisonings in Brazil is the "social welfare" system, which tracks hospital admissions for the purpose of expense reimbursement to hospitals. *Id.*

29. *Id.*

30. *See generally* Forget, *supra* note 1, at 13.

31. *Id.*

underestimate the occurrence of pesticide poisoning due to problems in identifying subacute and chronic pesticide exposures.

A recent study of pesticide residues in human milk among Brazilian agricultural workers revealed potentially hazardous levels of DDT due to occupational exposure.[32] Although one may not attribute all pesticide poisoning cases to occupational exposure,[33] it appears to be the leading cause of pesticide poisonings in Central and South America due to a number of factors.[34] First, occupational exposure often results from the improper use of pesticides by farm workers who have inadequate training or instructions regarding safe pesticide use.[35] Second, a significant number of farm workers are illiterate and, therefore, cannot read written label instructions.[36] Third, labels often are written in the language of the exporting country and, thus, may be incomprehensible to the user.[37] Finally, farm workers often use pesticides that others have transferred into unlabeled containers.[38]

Primitive working conditions also preclude the safe use of pesticides. Pesticide users often lack available protective technologies, such as respirators, gloves, or protective clothing.[39] In many instances, farmers do not provide even basic facilities to wash off pesticide residues with soap and water.[40] Further, farm

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32. *See* Y. K. Matuo et al., *Organochlorine Pesticide Residues in Human Milk in the Ribeirão Preto Region, State of São Paulo, Brazil*, 22 ARCHIVES ENVTL. CONTAMINATION & TOXICOLOGY 167 (1992). On average, DDT levels detected in human milk collected from occupationally exposed subjects were three times higher than WHO limits and six times higher than levels detected in non-exposed subjects. *Id.* DDT is an organochlorine pesticide frequently utilized in agricultural production. *Id.* at 168, 171.

33. In a survey of 13,000 pesticide poisonings in Sri Lanka, 73% were suicide attempts. Ravindra Fernando, *National Poisons Information Centre in a Developing Asian Country—The First Year's Experience*, 9 HUM. & EXPERIMENTAL TOXICOLOGY 161, 162 (1990) (citing J. Jeyaratnam et al., *Survey of Pesticide Poisoning in Sri Lanka*, 60 BULL. WORLD HEALTH ORG. 615 (1982)); *but see infra* note 34.

34. In Costa Rica, for example, 67.8% of pesticide poisonings were attributed to occupational exposure, while only 6.4% were attributed to suicide attempts. Forget, *supra* note 1, at 14. Occupational exposure typically occurs when farm workers apply pesticides. Lever-operated knapsack sprayers are one common method of pesticide application. *Id.* at 25.

35. Baird, *supra* note 12, at 966.

36. *Id.*

37. *Id.*

38. *Id.*

39. Kablack, *supra* note 3, at 284.

40. Baird, *supra* note 12, at 966.

workers whose living quarters are located near pesticide-treated fields receive additional exposure to pesticides.[41]

The tropical climate in Brazil exacerbates the risks of pesticide application. Many chemicals react differently in tropical or subtropical climates than in more temperate ones.[42] In addition, hot, humid conditions may increase the likelihood that workers will not wear uncomfortable protective clothing and gloves, despite the increased risk of skin contamination.[43]

Because the United States is a major exporter of pesticides, U.S. pesticide policy is another factor that impacts occupational and environmental health in Central and South America. In 1989, the United States exported approximately 380 million pounds of active-ingredient pesticides.[44] These exports accounted for twenty-nine percent of overall U.S. pesticide production and ten percent of the total world pesticide consumption.[45] Of course, foreign exports provide substantial income for U.S. companies, with pesticide export sales totalling approximately $2.4 billion annually.[46]

III. FEDERAL REGULATION OF PESTICIDES IN THE UNITED STATES AND BRAZIL

In the United States, the EPA regulates pesticide registration, manufacture, and distribution under the authority of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).[47] The definition of the term "pesticide" is broad, encompassing any substance or mixture of substances used for repelling or destroying a pest.[48] During registration, the EPA determines whether to approve pesticides for use, based on an evaluation of pesticide risks and benefits.[49] FIFRA prohibits anyone from distributing,

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41. *Id.*
42. Forget, *supra* note 1, at 26.
43. *Id.*
44. Pesticide Export Policy, *supra* note 14, at 9063.
45. *Id.*
46. *Unregistered, Exported Products Lack U.S. Health Standards, Group Charges*, Chem. Reg. Rep. (BNA) (Feb. 24, 1992), *available in* LEXIS, ENVIRN Library, BNA-CRD File.
47. *See* 7 U.S.C. §§ 136-136y.
48. *See generally id.* § 136u.
49. *See id.* § 136a.

selling, or receiving any pesticide that is not registered with the EPA administrator.[50]

In Brazil, Brazil Law Number 7802 provides authority for pesticide regulation.[51] As in the United States, the Brazilian pesticide law requires registration of pesticides with the federal government. Brazilian law defines pesticides as

> chemical products intended for use in the sectors of production, storage, and processing of agricultural products, in pastures, in protection of native or planted forests, and other ecosystems, and also of urban, water, and industrial environments, whose purpose is the alteration of the composition of flora or fauna, so as to preserve them from the damaging effects of living beings considered harmful, as well as substances and products employed as defoliants, desiccants, and growth stimulants and inhibitors.[52]

Brazil allows production, exportation, importation, sale, or use of pesticides only if previously registered with a federal agency in compliance with the directives and requirements of the federal agencies of health, environment, and agriculture.[53]

A. Registration of Pesticides in the United States and Brazil

To register a pesticide in the United States, FIFRA requires the registrant to file information about his pesticide with the EPA.[54] In deciding whether to register the pesticide, the EPA administrator evaluates the adverse effects and benefits of the pesticide.[55] Registrants may apply for experimental use permits

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50. *Id.*

51. Brazil Law No. 7802, *supra* note 10, art. 3 (July 11, 1989).

52. Brazil Decree No. 98,816, ch. I, art. 2, XX (Jan. 11, 1990), *reprinted in* 54 LEX COLETÂNEA DE LEGISLAÇÃO E JURISPRUDÊNCIA 46 (1990).

53. Brazil Law No. 7802, *supra* note 10, art. 3; Brazil Decree No. 98,816, *supra* note 52, ch. III, art. 6.

54. 7 U.S.C. § 136a(c)(1)-(2); 40 C.F.R. § 158.20(a)-(b) (1994). The EPA rules require that applicants submit data pertaining to product chemistry, residue chemistry, environmental fate, toxicology, reentry protection, aerial drift evaluation, wildlife and aquatic organisms, plant protection, non-target insects, product performance, and biochemical and microbial pesticides. 40 C.F.R. § 158. For additional standards for conducting acceptable tests, guidance on evaluation and reporting of data, further guidance on when data are required, definitions of most terms, and examples of protocols, see Pesticide Assessment Guidelines, *incorporated by reference in* 40 C.F.R. § 158.20(c) (1994) (unpublished documents on file with National Technical Information Service).

55. 7 U.S.C. §§ 136a(a), 136(bb).

in order to accumulate the information necessary to register a pesticide.[56]

The EPA administrator will approve registration of a pesticide if: (1) the pesticide meets the efficacy and labeling requirements of FIFRA; (2) the pesticide "will perform its intended function without adverse effects on the environment;" and (3) "when used in accordance with widespread and commonly recognized practice, it will not generally cause unreasonable adverse effects on the environment."[57] Congress defined "unreasonable adverse effects on the environment" to include "any unreasonable risk to man or the environment, taking into account the economic, social, and environmental costs and benefits of the use of any pesticide."[58] Clearly, this definition directs the administrator to consider the economic, social, and environmental costs and benefits of pesticides. The statute, however, provides little guidance as to the relative weights the administrator should allocate to the costs and benefits of a particular pesticide's use.

The EPA rules, promulgated under FIFRA, describe further procedures for pesticide evaluation. These rules specify the types and minimum amount of data that a registrant must submit to allow the EPA to evaluate the risks and benefits of a pesticide.[59] The rules include criteria for determining whether to classify a pesticide for general or restricted use.[60] Further, the rules provide some guidance for determining whether a pesticide causes unreasonable adverse effects.[61]

After registration of a pesticide in the United States, FIFRA places a continuing duty on registrants to inform the EPA of any "additional factual information regarding unreasonable adverse effects on the environment of the pesticide."[62] A registrant's failure to report this required information constitutes a violation

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56. 7 U.S.C. § 136c(a).
57. *Id.* § 136a(c)(5)(D).
58. *Id.* § 136(bb).
59. 40 C.F.R. § 158.20(b)(3).
60. *Id.* § 152.170(b). The criteria include tolerances for acute dermal LD_{50}, inhalation LC_{50}, eye irritation or corneal opacity, skin irritation, and acute oral LD_{50}. Pesticides that do not meet these tolerance levels are classified for restricted use unless the label meets certain additional criteria or the benefits of unrestricted use outweigh the risks of unrestricted use. *See infra* text accompanying notes 98-103 (explaining general and restricted use pesticide classifications under FIFRA).
61. *See generally* 40 C.F.R. § 152.170.
62. 7 U.S.C. § 136d(a)(2).

of FIFRA.[63] Information that a registrant must submit includes: complete and incomplete toxicological studies, epidemiological studies, efficacy studies, studies of dietary or environmental pesticide residues, toxic or adverse effect incident reports, failure of performance incident reports, dietary or environmental pesticide residue incident reports, and other information that might raise questions about the continued registrability of a registrant's pesticide product.[64]

Registrants that successfully register their pesticides must request a continuation of registration every five years.[65] In addition, FIFRA directs the EPA to re-register pesticides that it registered prior to 1984 because of concerns that the earlier review criteria used to evaluate those pesticides were inadequate.[66] Re-registration provisions allow the EPA to reevaluate the costs and benefits of specific pesticides without instituting a formal suspension or cancellation proceeding.

In Brazil, the Ministry of Agriculture, the Ministry of Health, and the Ministry of Interior are all involved in establishing standards for the regulation of pesticides.[67] The Brazilian Institute of Environmental and Renewable Natural Resources (IBAMA)[68] is the federal environmental agency responsible for pesticide regulation. IBAMA grants registration of a new pesticide product if the pesticide's toxic action upon humans and the environment is verifiably equal to or less than that of products already registered for the same use.[69] The regulatory supplement to Brazilian pesticide law contains additional criteria for evaluation of pesticide toxicity.[70] These criteria include: toxicity of the formulation, presence of special toxicological problems,[71] persistence in the environment, bioaccumulation, formulation, and

63. 40 C.F.R. § 153.67(a).

64. *See id.* §§ 153.69-.78.

65. 7 U.S.C. § 136d(a)(1).

66. *Id.* § 136a-1(a); *see infra* notes 173-175 and accompanying text.

67. Brazil Decree No. 98,816, *supra* note 52, ch. II, arts. 3, 4, 5.

68. The official name of this federal agency is Instituto Brasilieiro do Meio Ambiente e dos Recursos Naturais Renováveis.

69. Brazil Law No. 7802, *supra* note 10, art. 3, § 5; Brazil Decree No. 98,816, *supra* note 52, ch. III, art. 14.

70. Brazil Decree No. 98,816, *supra* note 52, ch. III.

71. *Id.* Special toxicological problems include neurotoxicity, fetal toxicity, hormonal and behavioral action, and reproductive action. *Id.* ch. III, art. 14.

method of application.[72] A registrant may obtain special temporary registration from the federal government if the planned pesticide use is for research, experiments, or related activities.[73] Brazilian law prohibits registration of pesticides, their components, and related substances:

> a) [for which] no method exists for deactivating their components to prevent their remaining residues from provoking risks to the environment and public health;
> b) [for which] there is no antidote or effective treatment in Brazil;
> c) [that] reveal teratogenic, carcinogenic, or mutagenic characteristics, according to current results of experiments in the scientific community;
> d) [that] provoke hormonal disturbances, damage to the reproductive system, according to proceedings and current requirements of the scientific community;
> e) [that] show themselves more dangerous to humans through scientific laboratory tests with animals;
> f) [that] have characteristics that cause harm to the environment.[74]

Registrations last for five years and are renewable in additional five year increments, so long as a registrant submits the request 180 days prior to the expiration date.[75] Normative Administrative Rule Number 349 establishes procedures for IBAMA to follow when registering, re-registering, and extending pesticide uses.[76] As part of its review of pesticide registration applications, IBAMA must evaluate the following parameters: physical and chemical properties; toxicity to microorganisms; toxicity to micro crustacea, fish, algae, and soil organisms; degradation and transport processes; toxicity to mammals; and mutagenic, embryotoxic, fetotoxic, and carcinogenic potential.[77] Data regarding a pesticide are valid for two years, and foreign laboratory results are acceptable if foreign countries officially recognize the results.[78] As in the United States, the holders of

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72. *Id.* ch. III, art. 14.
73. *Id.* ch. I, art. 2, XIV.
74. Brazil Law No. 7802, *supra* note 10, art. 3, § 6.
75. Brazil Decree No. 98,816, *supra* note 52, ch. III, art. 9, § 1.
76. Brazil Normative Administrative Rule No. 349, art. 1 (Mar. 14, 1990).
77. *Id.* annex, IV(d).
78. *Id.*

pesticide registrations have a duty to furnish to IBAMA any "innovation in data," including new information that relates to the dangers of a given product.[79]

B. Suspension and Cancellation of Pesticide Registrations in the United States and Brazil

Upon discovery of new evidence of adverse effects regarding a particular pesticide, the EPA may reconsider existing pesticide registrations.[80] In addition, the EPA may restrict, suspend, or cancel pesticide registrations that do not meet statutory requirements.[81] Cancellation or suspension actions are subject to cost-benefit analyses like those performed during the registration process, except this analysis includes economic costs as well as environmental ones. The administrator must consider "the impact of the action proposed in such notice on production and prices of agricultural commodities, retail food prices, and otherwise on the agricultural economy."[82] Prior to issuing a final cancellation or suspension order, the administrator first must consider restricting a pesticide's use.[83] If restricted use is not feasible, the administrator must explain fully the reasons for the cancellation or restriction.[84]

Brazilian pesticide laws also provide for the cancellation of existing pesticide registrations that its agencies have determined to be particularly dangerous.[85] Challenges to pesticide registrations may involve pesticides that damage the environment, human health, or animal health.[86] Generally, three groups may challenge pesticide registrations:

> 1) class organizations that represent professionals associated with agriculture or pesticide-related industries (such as engineer associations);
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> 2) political parties represented in the Brazilian National Congress; and

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79. Brazil Law No. 7802, *supra* note 10, art. 3, § 2.
80. 7 U.S.C. §§ 136d(a)(2), (b).
81. *See* 7 U.S.C. § 136d(b)–(c).
82. *Id.* § 136d(b).
83. *Id.*
84. *Id.*
85. Brazil Law No. 7802, *supra* note 10, art. 3, § 6; Paraná Law No. 7827, *supra* note 25, art. 8.
86. Brazil Law No. 7802, *supra* note 10, art. 5.

> 3) legally constituted entities for the defense of interests related to consumer protection, the environment, and natural resources (such as non-governmental organizations (NGOs)).[87]

In addition, international organizations that oversee health, food, or the environment may alert the government to any danger associated with a pesticide as long as Brazil is a member of that organization.[88] As a member, the Brazilian government has a duty to take appropriate steps to address the international organization's concerns.[89] In addition, the government is responsible for any adverse impacts caused by its failure to take appropriate action.[90]

C. Pesticide Labeling and Use in the United States and Brazil

In addition to regulating the registration of pesticides, FIFRA also regulates the labeling and use of pesticides.[91] The sale or distribution of mislabeled pesticides is unlawful under FIFRA,[92] and the EPA administrator reviews each registration to determine whether the label satisfies FIFRA requirements. A pesticide is mislabeled if the label does not contain directions for use or does not contain a warning or cautionary statement that is "adequate to protect health and the environment."[93]

Labels specify pesticide application rates, which are the minimum potency necessary to eradicate the pest. FIFRA prohibits any person from altering a label, or using any registered pesticide in a manner inconsistent with its labeling.[94] FIFRA also prohibits any person from adding to or taking any substance from a pesticide to defeat the purposes of FIFRA.[95]

In Brazil, as in the United States, pesticide labels contain directions for use. Labels also must include a variety of infor-

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87. *Id.*
88. *Id.* art. 3, § 4.
89. *Id.*
90. *Id.*
91. *See* 7 U.S.C. § 136(p)(1). Pesticide labels are composed of written, printed, or graphic material that accompanies or is attached to pesticide containers. *Id.* Labels must include, among other things, directions for use that are adequate to protect health and the environment. *Id.* § 136(q)(1)(F).
92. *Id.* § 136j(a)(1)(E). FIFRA uses the word "misbranded" to refer to mislabeled pesticides.
93. *Id.* § 136(q)(1)(F)-(G).
94. *Id.* § 136j(a)(2)(A)(G).
95. *Id.* § 136j.

mation relating to potential dangers and appropriate methods of use, including rates of application and lists of specific crops and pests upon which the pesticide is applicable.[96] Labels are color coded, depending on the pesticide's relative toxicity.[97]

D. Applicator Certification Requirements in the United States and Brazil

FIFRA classifies pesticides for either general or restricted use.[98] General use pesticides are those that the EPA determines will not cause any unreasonable adverse effects on the environment when used in accordance with their labeling.[99] Restricted use pesticides are those that the EPA determines "may generally cause, without additional regulatory restrictions, unreasonable adverse effects on the environment," when used in accordance with the labeling.[100]

Any person may buy and use general use pesticides, while only a certified applicator, or someone under the direct supervision of a certified applicator, may apply restricted use pesticides.[101] The EPA issues standards for the certification of applicators of pesticides to insure that an individual is competent to use and handle pesticides.[102] The EPA must certify applicators in accordance with FIFRA or an EPA-approved state certification plan.[103]

While Brazilian law does not require training or certification for pesticide applicators,[104] in order to purchase a pesticide in

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96. Brazil Law No. 7802, *supra* note 10, art. 7.

97. Brazil Decree No. 98,816, *supra* note 52, annex 4. The enabling legislation spells out the detailed requirements of Brazilian federal law. *See generally id.*

98. 7 U.S.C. § 136a(d)(1)(A) (1994).

99. *Id.* § 136a(d)(1)(B).

100. *Id.* § 136a(d)(1)(C).

101. *Id.*

102. *Id.* § 136i(a)(1).

103. 7 U.S.C. § 136i(a)(1)-(2). A state may submit a plan to certify applicators of restricted use pesticides, and the EPA may approve that plan if it determines that the state has adequate regulatory structure, legal authority, funds, reporting systems, and standards to implement and conduct a satisfactory certification program. *Id.* § 136i(a)(2). A state certification program must contain provisions to submit required reports to the EPA and must have certification standards that conform with the standards promulgated by the EPA under FIFRA. *Id.* § 136b(a)(2)(D)-(E). In addition, the EPA rules and state certification standards must provide information concerning integrated pest management techniques to individuals upon request. *Id.* § 136i(c).

104. Paraná Law No. 7827, *supra* note 25, art. 9.

Paraná, a purchaser must obtain a special authorization or prescription from an agricultural engineer or agronomist.[105] Brazilian law divides registered pesticides into four classes, depending upon the relative danger associated with each pesticide.[106] Color-coded labels reflect the four classes and include special precautions and instructions.[107]

IV. STATE REGULATION OF PESTICIDES IN THE UNITED STATES AND BRAZIL

In the United States, individual states may regulate the intrastate sale or use of any federally registered pesticide, as long as the regulation does not violate FIFRA.[108] A state also may register federally registered pesticides for additional uses within that state.[109] The EPA may suspend this state authority to register pesticides if it determines that a state is not capable of exercising, or has failed to exercise, adequate control to insure state registration in accordance with FIFRA provisions.[110]

In Florida, the Department of Agriculture and Consumer Services (DACS) regulates pesticide registration, distribution, and application pursuant to chapter 487 of the Florida Statutes.[111] Like FIFRA, chapter 487 focuses primarily on registration and distribution of pesticides and relies on label restrictions to regulate their use.[112] Chapter 487 requires registrants to submit information about a pesticide, including: an ingredient statement, a copy of the labeling, a statement of claims including directions for use, and a guaranteed analysis of the active ingredients that the pesticide contains.[113] The DACS adopts rules that govern the review of data submitted by a registrant and may require the registrant to submit the complete formula, evidence of the efficacy and the safety of the pesticide, and any other relevant data.[114]

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105. *Id.* art. 10.

106. Brazil Decree No. 98,816, *supra* note 52, ch. I, art. 2, XXXI.

107. Id. annex IV.

108. 7 U.S.C. § 136v(a)(1994).

109. *Id.* § 136v(c)(1) (1994). States may register pesticides to meet special local needs, provided the pesticides are formulated for distribution and use within the state and the registration for such use has not been previously denied or cancelled by the EPA. *Id.*

110. *Id.* § 136v(c)(4).

111. FLA. STAT. ch. 487 (1993).

112. *See, e.g., id.* ch. 487.031, 487.041.

113. *Id.* ch. 487.041(1)(c).

114. *Id.* ch. 487.041(3).

DACS rules generally require a registrant to submit all information previously submitted to the EPA in support of federal registration to the DACS in the form of data summaries.[115] If the DACS determines that the data summaries are insufficient to allow adequate public health and environmental assessments, then it may require the applicant to submit or generate additional data.[116] In its review of applications, the DACS considers data on product chemistry, toxicology, environmental fate, residue chemistry, and workers/applicators.[117] The DACS also considers data from other authoritative sources.[118]

After the DACS analyzes all data, chapter 487 authorizes it to approve a registration, to register a product conditionally, or to deny a registration.[119] The DACS may restrict or limit a registered pesticide through labels or rules that govern the use of a product.[120] As in federal pesticide registrations under FIFRA, Florida registrants have a continuing duty to report any new information indicating that a pesticide may cause unreasonable adverse effects on public health or the environment.[121] The DACS also may consider new information from sources other than the registrant.[122]

States have primary enforcement responsibility for pesticide use violations, provided the state program meets federal requirements.[123] The EPA retains authority to enforce the provisions of FIFRA, even after determining that a state has primary

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115. FLA. ADMIN. CODE ANN. r. 5E-2.031(2)(a) (1989).
116. *Id.* r. 5E-2.031(2)(b).
117. *Id.* r. 5E-2.031(3).
118. *Id.* r. 5E-2.031(4).
119. *Id.* r. 5E-2.031(6).
120. *Id.* r. 5E-2.031(7). *See, e.g., id.* r.5E-13 (discussing specific rules that apply to the use of mosquito control pesticides).
121. *Id.* r. 5E-2.031(8).
122. *Id.* r. 5E-2.031(9).
123. 7 U.S.C. § 136w-1. States have primacy if the EPA determines the state has adequate pesticide laws and regulations, enforcement procedures, and record-keeping and reporting procedures. *Id.* § 136w-1(a). Further, states that have cooperative agreements with the EPA for enforcement of pesticide use restrictions or certification of applicators of restricted-use pesticides are deemed to have primary enforcement authority. *Id.* § 136w-1(b). Florida has a cooperative enforcement agreement with the EPA. *See infra* notes 125-128 and accompanying text. The EPA assumes the enforcement responsibility, and the provision in FIFRA that allows the EPA to inspect records of producers, sellers, or distributors of pesticides is extended to apply to commercial applicators. 7 U.S.C. § 136w-1(c).

enforcement authority.[124] Thus, states may administer the provisions of FIFRA, provided the state regulations are at least as strict as those adopted pursuant to FIFRA.

Since 1979, Florida has participated in a yearly cooperative enforcement agreement with the EPA, whereby the state has primary enforcement authority over pesticide use violations.[125] Pursuant to the cooperative agreement, Florida conducts inspections to determine compliance with both state and federal law.[126] Florida, however, only takes enforcement action if state law on pesticide use violations mirrors federal law.[127] If a violation involves an area not regulated by the state, such as the manufacture of pesticides, the state will refer the violation to the EPA.[128]

Brazilian law also authorizes pesticide regulation at the state level.[129] The state of Paraná regulates pesticides pursuant to Law Number 7827.[130] Article 1 of the law prohibits the distribution and sale of pesticides without prior registration by the State Secretariat for Agriculture and the State Secretariat for the Interior.[131] Municipalities may establish additional restrictions on the use and storage of pesticides.[132]

At the state level, any legal association may challenge a pesticide registration by arguing that it causes "proven pernicious effects to human health, animals, and the environment."[133] Thus, state law provides broader standing to challenge pesticide registrations than federal law, which provides standing only to three groups.[134] A challenger must petition the State Secretariat

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124. 7 U.S.C. §§ 136v(a), 136v(c)(4), 136w-2 (1994).

125. Telephone Interview with Dr. Elizabeth G. Braxton, Environmental Administrator, Contracts and Program Coordination, Bureau of Compliance Monitoring, Division of Agriculture and Consumer Services, EPA (Nov. 6, 1995). FIFRA provides that "any state that enters into a cooperative agreement with the [EPA] . . . for the enforcement of pesticide use restrictions *shall* have primary enforcement responsibility . . . ." 7 U.S.C. § 136w-1(b) (1994) (emphasis added).

126. Braxton, *supra* note 125.

127. *Id.*

128. *Id.*

129. Brazil Law No. 7802, *supra* note 10, art. 10.

130. Paraná Law No. 7827, *supra* note 25.

131. *Id.* art. 1.

132. *Id.* art. 11.

133. Paraná Law No. 7827, *supra* note 25, art. 8.

134. *See supra* note 87 and accompanying text (describing groups with standing under federal law).

of Agriculture and the manufacturer or user must present a defense within fifteen days.[135]

V. U.S. PESTICIDE EXPORT POLICY

Critics accuse the U.S. pesticide export policy of being a regulatory double-standard.[136] Many of the pesticides that U.S. companies export are unregistered and, thus, illegal to use in the United States. According to pesticide industry and EPA estimates, the United States exports between twenty-six and forty-four banned or unregistered pesticides on an ongoing basis.[137] Annual U.S. export sales of unregistered pesticides total approximately $750 million.[138]

Although FIFRA provides comprehensive authority to the EPA to regulate the domestic use of pesticides, the EPA has comparatively little regulatory control over the exportation of pesticides. Until recently, the prevailing regulatory standard for pesticide exports was informed consent and *caveat emptor*.[139] The United States provided foreign purchasers and governments with certain information about the safety and registration status of exported pesticides, thus allowing purchasers to buy at their own risk.

Under section 17 of FIFRA, foreign purchasers and governments receive information about pesticides through several notification systems.[140] First, FIFRA section 17(a) directs the

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135. *Id.* art. 8, § 1-2.

136. Karen A. Goldberg, *Efforts to Prevent Misuse of Pesticides Exported to Developing Countries: Progressing Beyond Regulation and Notification*, 12 ECOLOGY L.Q. 1025, 1032 (1985) (citing Comment, *United States Export of Banned Products: Legal and Moral Implications*, 10 DENV. J. INT'L L. & POL'Y 537, 539 (1981)).

137. *List of Unregistered Exports Would be Supplied to the FDA, USDA*, Chem. Reg. Rep. (BNA) (Dec. 6, 1991), *available in* LEXIS, ENVIRN Library, BNA-CRD File. On January 27, 1992, the National Agricultural Chemical Association submitted a list of 26 unregistered pesticide active ingredients that are exported for use on food or feed crops. *Industry Gives Senate Committee Names of 26 Unregistered, Exported Chemicals*, Chem. Reg. Rep. (BNA) (Jan. 28, 1992), *available in* LEXIS, ENVIRN Library, BNA-CRD File [hereinafter *Names*].

138. *Names, supra* note 137.

139. Julian C. Juergensmeyer, *Recent Developments in U.S. Law Affecting the International Trade of Agricultural Products and Pesticides*, 3 FLA. J. INT'L L. 27, 32 (1987). The maxim *caveat emptor* means let the buyer beware. BLACK'S LAW DICTIONARY 222 (6th ed. 1990).

140. *See* 7 U.S.C. § 136o (1994).

EPA to establish specific labeling requirements on exported pesticides.[141] Second, section 17(a) requires purchaser acknowledgment statements notifying foreign purchasers and governments of the export of an unregistered pesticide.[142] Third, section 17(b) requires the EPA to provide foreign governments with notices of regulatory actions taken by the EPA.[143] Finally, section 17(d) directs the EPA to participate in international efforts for pesticide research and regulation.[144]

Critics of the FIFRA notification procedures charge that notification often fails to provide actual notice to foreign purchasers and governments regarding the dangers of exported pesticides.[145] For example, in the past, EPA policy required that an "appropriate official" of the government of the importing country receive copies of purchaser acknowledgment statements.[146] Because EPA policy did not specify which official should receive purchaser acknowledgment statements, these statements often became lost in diplomatic channels.[147] In addition, critics challenged the adequacy of notification by labeling because of the difficulty in assuring that warning information was in the user's language or that the user even was sufficiently literate to understand the labeling. Moreover, "informed consent" from pesticide purchasers did not ensure that farm workers ultimately handling the pesticides were informed or able to give their consent.[148]

On January 19, 1993, the EPA issued a new policy statement and regulations for pesticide exports.[149] The new Pesticide

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141. *See id.* § 136p.

142. *Id.* § 136o(a).

143. *Id.* § 136o(b).

144. *Id.* § 136o(d).

145. *See* PESTICIDES: EXPORT OF UNREGISTERED PESTICIDES IS NOT ADEQUATELY MONITORED BY EPA, GAO (1989) [hereinafter GAO REPORT].

146. Juergensmeyer, *supra* note 139, at 32.

147. *Id.*

148. Goldberg, *supra* note 136, at 1035.

149. *See* Pesticide Export Policy, *supra* note 14, at 9062. Outgoing EPA Administrator William Reilly approved the final Pesticide Export Policy on January 19, 1993. *See Clinton Administration Orders Pullback of Dozens of Rules, Including PMN Proposal*, Chem. Reg. Rep. (BNA) (Jan. 29, 1993), *available in* LEXIS, ENVIRN Library, CHEMRG File. On January 22, 1993, however, the Office of Management and Budget temporarily retracted the Policy, along with other EPA actions promulgated during the final days of the Bush administration. *Id.* The Policy again was released on February 9, 1993, without major changes, and was published in the Federal Register on February 18, 1993. Pesticide

Export Policy set out two major goals: (1) to ensure the safety of U.S. food supplies; and (2) to protect public health and the environment from unreasonable adverse effects of pesticides, both domestically and internationally.[150] Under the new policy, the EPA still permits the export of pesticides not registered for use in the United States, but the EPA has augmented the labeling and notification requirements.[151]

Under the EPA's previous policy, the EPA required manufacturers to produce labels with warning information printed in both English and the language of the importing country.[152] Required warning information included cautionary and ingredient statements, and where appropriate, the word "poison" and a statement of appropriate medical treatment.[153] Labels for unregistered pesticides included the statement, "Not Registered for Use in the United States of America."[154]

The new Pesticide Export Policy expands the language requirements for labels from bilingual to multilingual. Exporters must "include the language of each country to which the exporter knows, or can reasonably be expected to know, that the product will be shipped."[155] Unfortunately, the policy allows the exporter to print this multilingual warning information on the shipping container rather than on a label attached to the immediate product container.[156] Warning labels printed on shipping containers may become separated from the pesticide, thereby increasing the likelihood the information will never reach the user.

The new Pesticide Export Policy also modifies and expands notification requirements. Under the previous policy, the EPA sent purchaser acknowledgment statements for unregistered pesticides destined for export via the Department of State to the U.S. diplomatic post in the importing country.[157] The diplomatic posts sent the statements to appropriate government officials in the importing country.[158] The new policy requires the EPA to

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Export Policy, *supra* note 14, at 9062.

150. Pesticide Export Policy, *supra* note 14, at 9062.
151. *Id.*
152. *Id.* at 9066, 9068.
153. *Id.* at 9068.
154. *Id.* at 9066, 9068.
155. *Id.* at 9068.
156. *Id.* at 9067.
157. GAO REPORT, *supra* note 145, at 18.
158. Pesticide Export Policy, *supra* note 14, at 9075.

transmit notices directly to appropriate officials in the importing country and, when known, to the countries of final destination or intended use.[159]

VI. SUGGESTED REFORMS

A. Impact of the New U.S. Pesticide Export Policy

Under the new U.S. Pesticide Export Policy, importing countries such as Brazil will have more reliable access to information regarding U.S. exports and regulatory actions. The new policy, however, continues to allow the export of many dangerous substances prohibited from domestic use in the United States. To promote environmental and occupational health, Brazilian officials must continue their efforts at home to reduce pesticide poisonings and fatalities.

B. Education and Prevention of Pesticide Poisoning in the United States and Brazil

Both countries' pesticide laws establish a regulatory framework for registration of pesticides, certification of pesticide applicators, and use of pesticides. In addition, both countries assess the relative health and environmental risks of pesticides when determining whether to grant registration. Once a pesticide is registered, however, the regulatory programs rely on the cooperation and ability of the individual user to interpret pesticide labels. Because uninformed or illiterate people are often the users of pesticides, the inappropriate use of dangerous pesticides in both Florida and Paraná continues to threaten the environment and public health. In the absence of more stringent requirements on pesticide production, sale, and use, the United States and Brazil should continue their mutual efforts to improve poisoning prevention and monitoring.

Teaching farm workers about the safe use of pesticides may reduce the incidence of pesticide poisonings. A training program for farm workers could include information on the health effects of pesticides, the routes of entry and symptoms of pesticide poisoning, exposure prevention, and the first aid needed in

159. *Id.* The new policy also eliminates a loophole for unregistered pesticides substantially similar in composition and use to currently registered products. *Id.* at 9069-72.

poisoning emergencies.[160] Evaluating the quantitative indicators of pesticide exposure and poisoning would reflect the effectiveness of farmworker training programs. For example, one study in Nicaragua demonstrated that workers with training had higher cholinesterase levels than untrained workers, suggesting greater pesticide exposure among untrained workers.[161]

Several commentators have proposed a "popular" education model for teaching farm workers about the hazards and safe use of pesticides.[162] Popular education advocates training "multipliers," resource people such as agronomists and agricultural extension agents, who would provide information and training to farm workers and the general public.[163] The goal of popular education "is to empower people to act to improve health and safety for themselves, their co-workers, and their communities."[164]

C. Monitoring Pesticide Poisoning in Brazil

The National System of Poison Information and the Social Welfare System provide data on pesticide poisoning in Brazil.[165] Although a comparison of 1985 data from these agencies provides conflicting estimates of poisoning cases, these agencies have differing organizational objectives.[166] The National System of Poison Information covers sixty percent of the population and lists cases coming to the centers for information, assistance or consul-

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160. Merri Weinger & Mark Lyons, *Problem-Solving in the Fields: An Action-Oriented Approach to Farmworker Education About Pesticides*, 22 AM. J. INDUS. MED. 677, 679 (1992).

161. Weinger & Lyons, *supra* note 160, at 687 (citing R. McConnell et al., Hazards of Closed Pesticide Mixing and Loading Systems: The Paradox of Protective Technology in the Third World (1990) (unpublished manuscript presented at American Public Health Association Annual Meeting, New York, New York)). The mode of action for several groups of pesticides, including the organophosphates and carbamates, is through inhibition of cholinesterase, the nerve transmitting enzyme. ISABEL C. JOHNSON ET AL., HANDBOOK OF PESTICIDE USE AND EFFECTS ON FLORIDA WILDLIFE 9 (1991) (prepared for the Florida Game and Fresh Water Fish Commission); Forget, *supra* note 1, at 14. Inhibition of cholinesterase results in a continual nerve firing and a subsequent failure of nerve impulse propagation. Johnson, *supra* at 9. The level of cholinesterase in human blood may be an indicator of pesticide exposure. *Id.*

162. Weinger & Lyons, *supra* note 160, at 688.

163. *Id.* at 689.

164. *Id.* at 688.

165. *See generally* Rahde, *supra* note 20, at 262.

166. *Id.*

tation, treatment, or the supply of antidotes.[167] By contrast, social welfare registrations record poisoning cases for the purpose of expense reimbursement to hospitals.[168]

Medical commentators have proposed pilot studies in Brazil for developing more accurate assessments of morbidity and mortality due to pesticide poisonings.[169] Such studies would seek to integrate data available from Poison Control Centers and hospital admission records, as well as death certificates. Results from these studies would provide a model for monitoring programs in other regions and could lead to a uniform methodology for assessment of pesticide poisoning.

D. Information Sharing Between Countries

The pesticide registration process in the United States generates considerable information regarding the environmental and health impact of specific pesticides. Most U.S. manufactured pesticides: (1) are registered currently in the United States; (2) are not registered because they were either never submitted or submitted but not approved; or (3) were registered previously but have been canceled due to concerns about human health and the environment.[170] Accordingly, the EPA has evaluated most pesticides manufactured in the United States through the EPA's registration process. Federal and state regulators in Brazil should obtain all available information to allow them to make informed decisions regarding attempts to register U.S. manufactured pesticides in Brazil. A system of electronic communications between regulators in the United States and Brazil could greatly improve information access and sharing, to the mutual benefit of both countries.

E. U.S. Restricted Use Pesticides in Brazil

Brazilian regulators should pay particular attention to pesticides that the United States has classified for restricted use. The EPA has determined restricted use pesticides to have

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167. *Id.* at 262.

168. Rahde, *supra* note 20, at 262.

169. *Id.*

170. GAO REPORT, *supra* note 145, at 11-12, table 1.1 (GAO/RCED-89-128, Apr. 1989). From 1985 to 1987, about one quarter of pesticide exports from the United States were not registered for use in the United States. *Id.* at 11.

unreasonable adverse impacts on the environment when used in accordance with labeling and to require special applicator training for safe application.[171] Because Brazil does not have an applicator certification or training program, persons applying restricted use pesticides may be at considerable risk.

F. Non-Registered U.S. Pesticides in Brazil

Similarly, regulators in Brazil should scrutinize closely pesticides that U.S. companies have manufactured but have not registered for use in the United States. Pesticides may be unregistered because: (1) the EPA determined that the pesticides may cause cancer or otherwise endanger humans, wildlife, or the environment; (2) pesticide producers have voluntarily removed the pesticides from the market for economic reasons or because of potential adverse health or environmental effects; or (3) the pesticide producer never attempted to register the pesticide in the United States.[172] Brazilian federal and state regulators should be wary of non-registered pesticides exported from the United States and first should determine why a pesticide is not registered for use in the United States. Regulators then should question seriously the wisdom of using these non-registered U.S. pesticides, considering the potentially extreme health and environmental risks associated with many of these pesticides.

G. Re-registration of U.S. Registered Pesticides

FIFRA requires that the EPA re-register older pesticides because of concerns that the data supporting these registrations may be inadequate to insure their safe use.[173] Accordingly, the EPA is currently in the process of reevaluating and re-registering pesticides registered prior to 1984.[174] During the re-registration process, the EPA may reevaluate the environmental and health hazards, as well as the benefits associated with existing pesticide

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171. 7 U.S.C. § 136a(d)(1)(c) (1994).

172. Crowe, *supra* note 12, at 320.

173. *See* H.R. REP. NO. 939, 100th Cong., 2d Sess. 28-29 (1988), *reprinted in* 1988 U.S.C.C.A.N. 3474, 3477-78. *See also* Scott Ferguson & Ed Gray, *1988 FIFRA Amendments: A Major Step in Pesticide Regulation*, 19 ENVTL. L. REP. 10070, 10071-78 (1989) (discussing the old pesticides problem and the FIFRA's re-registration requirement).

174. 7 U.S.C. § 136a-1(a)(1994).

registrations.[175] Brazilian federal and state regulators should request data relating to U.S. re-registration of pesticides that Brazilian regulators have approved for use in Brazil. Lawmakers and regulators also should consider whether a similar re-registration effort would benefit Brazil.

H. Brazilian Pesticide Registration Review Standards & Criteria

Brazilian pesticide laws contain detailed review criteria that should prevent the registration of unacceptably dangerous pesticides.[176] The general federal standard of review of applications for pesticide registrations, however, is whether the new product's toxic action upon humans and the environment is verifiably equal to or less than that of products already registered for the same use.[177] This standard appears to create a presumption in favor of registration of any pesticide that is less toxic than the most toxic currently registered pesticides. The standard does not take into account the possibility that unacceptably dangerous pesticides previously have passed through the registration process.

For example, if DDT were currently a registered pesticide, other pesticides that had similar adverse impacts, but which were no more egregious than DDT, would satisfy the standard. Accordingly, the standard of review should require state and federal regulators to evaluate each new pesticide thoroughly based on other specific review criteria contained in Brazilian statutory and administrative law and not depend on the presumed acceptable standards of currently registered pesticides.

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175. Under the FIFRA, Congress has defined registration to include re-registration. 7 U.S.C. § 136(z) (1994). Therefore, pesticides being re-registered are subject to the same data submission, data evaluation, and approval criteria applicable to applications for new registrations. *See* Ferguson & Gray, *supra* note 173, at 10072-73, n.22 and accompanying text. *See also* 7 U.S.C. § 136a-l(g)(2)(c) (1994) (requiring the EPA to determine whether applications for pesticide re-registration meet the criteria for approval of new pesticide registrations contained in § 136a(c)(5) of FIFRA).

176. An example is the requirement that prohibits registration of pesticides that reveal teratogenic, carcinogenic, or mutagenic characteristics.

177. Brazil Law No. 7802, *supra* note 10, art. 3, § 5; Brazil Decree No. 98,816, *supra* note 52, ch. III, art. 14.

VII. CONCLUSION

Pesticide regulatory programs in the United States and Brazil are remarkably similar in many procedural and substantive aspects. For example, pesticide regulatory programs in both countries depend heavily upon the registration process to assess pesticide risks. Yet, in comparing application and use at state levels, the fact remains that pesticide poisonings occur at a much higher rate in Paraná, Brazil. Although several reasons exist for this disparity, one easily rectified deficiency is the inadequate transfer of information regarding pesticide risks from U.S. regulators to Brazilian regulators. The United States is a repository for data regarding pesticide risks because U.S. companies develop and register many of the pesticides used throughout the world. Clearly, increased transfers of scientific data from the United States would enhance the ability of Brazilian regulators to make informed decisions regarding pesticide risks.

U.S. pesticide export policy has a direct impact on pesticide policy in importing countries. The more detailed and accurate information the United States provides regarding pesticide exports, the more likely an importing country such as Brazil will be able to make informed decisions regarding pesticide registration and use. Although the United States is not obligated to share all of its pesticide risk information with foreign countries, the new U.S. Pesticide Export Policy does require transfer of certain information regarding pesticide exports. Further, recent international pronouncements on the leadership role of the United States in the development of environmental policy indicate that the United States has a general duty to facilitate the transfer of information and technology to less developed countries.[178]

In addition, pesticide applicators and citizens in Paraná need adequate training and education regarding pesticides. Once a pesticide is registered, the burden of safety shifts almost entirely

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178. *See, e.g.*, *Rio Declaration on Environment and Development*, United Nations Conference on Environment and Development, Principle 7, U.N. Doc. A/CONF.151/5/Rev. 1 (1992), *reprinted in* 31 I.L.M. 874, 877 (1992). *But see* Jeffrey D. Kovar, *A Short Guide to the Rio Declaration*, 4 COLO. J. INT'L ENVTL. L. & POL'Y 119, 129-30 (1993)(citing *Report of the United Nations Conference on Environment and Development*, United Nations Conference on the Environment and Development, at 20-21, U.N. Doc. A/CONF.151/26, vol. IV (1992) (acknowledging the special leadership role of the United States but disavowing any international obligations or liabilities)).

to applicators to apply the pesticides according to label instructions. Consequently, applicators must be able to read and comprehend label instructions if they are to apply the pesticides safely. Comprehensive education and training programs could greatly reduce pesticide poisonings in Brazil.