

Biotechnology and Suicide in India

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Were it not for the debate over Genetically Modified Organisms (GMOs), few outside of India ever would have heard of the suicides. St Louis Post-Dispatch reporter Bill Lambrecht only found the story because he was covering the GMO controversy in India, and even then his paper ran the story under a headline about Monsanto's problems ("India Gives Monsanto An Unstable Lab For Genetics In Farming," Nov 22, 1998).[1](#)

The Facts

Who: cotton farmers, particularly small and marginal ones.
What: suicide, mostly by drinking pesticides. Where: the epicenter was Warangal District of Andhra Pradesh, although agrarian suicides were (and still are) occurring elsewhere.
When: the worst was in 1998, when over 500 took their own lives in Warangal, but the suicides have continued, topping 600* in Warangal alone.
But why?



This is the subject of sharp disagreement, largely because of GM issues. India is a key battle line in the global war over GM crops, and both sides interpret the Warangal suicides as supporting their position. Monsanto attributes the suicides to crop destruction by pesticide-resistant bollworms; they offer GM "Bollgard" cotton, which they have been trying to get approved for sale in India, as a solution. Vandana Shiva, one of the world's top anti-GM activists, blames the suicides on globalization, purchased farm inputs and intrusive technologies; she contends that GM crops would worsen poverty and indebtedness by concentrating power, promoting ecologically unstable monocultures, and discouraging traditional seed-saving and exchange.[2](#)

Why Suicide?

For such competing interpretive claims, the stakes are very high: dozens of GM plants are at various stages of development and approval for use in developing countries, and public opinion often turns on striking and memorable stories. For Monsanto and Shiva, Warangal is a means of promoting polarized views on GM crops. Yet as an anthropologist who studies farmers in developing countries, I cannot see how Warangal can offer any lessons on biotechnology until the case is understood on its own merits.

I do not oppose GM crops in general; in fact, I recently took a leave to participate in the genetic modification of cassava. There are GM crops in development that probably can contribute to agricultural sustainability (more so than the overhyped "Golden Rice"). What I do oppose is the monolithic praising or condemning of GM crops, which is what we hear routinely from industry, green critics and even well-meaning public-sector

biotechnologists who are poorly equipped to evaluate the larger contexts of their inventions.

There are vital larger issues raised by agricultural biotechnology, but we should begin with farmers' own views of the causes of the Warangal suicides, and ask what impact Bollgard might have. The proximate cause of the suicides is debt traps of which almost every farmer complains. Farmers are fronted inputs by dealers at exorbitant interest rates; the indigenous lenders have been chased off; and the new dealer/lenders, from an outside ethnic group, overextend credit and use brutal methods of collecting delinquent payments. Some desperate farmers are influenced by the government policy of payments (around \$2,200) to suicide victim's survivors -- this indeed may influence the method of suicide, to make sure it is not construed as an accident.³ (This is a poignant contrast with American farmers' practice of staging accidents, so their death will not be construed as a suicide and insurance payments withheld.) But why do crops fail? The farmers themselves stress the pesticide treadmill and spurious seed.



[Pesticide spraying](#)

Pesticide Treadmill

Cotton is the classic "pesticide treadmill" crop. Warangal farmers spend heavily on pesticides that are applied desperately and indiscriminately to combat a plethora of increasingly resistant pests. Monsanto emphasizes the predations from the "American bollworm," against which Bollgard is effective (it is modified with a gene from the "Bt" bacterium to produce proteins lethal to some lepidopteran insects). Monsanto's India marketing director even has claimed Bollgard could have prevented the 1998 suicides.⁴ Unfortunately, the American bollworm is only one of many cotton pests in India, and the main destruction in 1997-98 was caused by Spodoptera, against which Bollgard is not effective.⁵ Pesticide sprayings will have to continue even with Bollgard. Preliminary studies in China and Mexico show the higher cost of Bt cotton initially is offset by reduced pesticide costs,⁶ but those areas do not have Warangal's problems with insects unaffected by Bt. In the short run, Bollgard may have as much potential to exacerbate debt traps as to mitigate them. In the long run, bollworms surely will develop resistance to Bt; the US practice of planting non-Bt refugia to prevent resistance is unworkable in India.



[Cotton pests](#)

Spurious Seed

Warangal crops also fail because of "spurious seed"—inferior cotton seed packaged as popular brands. Warangal farmers need much tighter regulation at the point-of-sale (the input vendors), but India's regulatory focus long has been at the other end of the seed system (approval and certification).⁷ This year, unapproved and illegal GM cotton (apparently developed with stolen germplasm) was found growing in Gujarat, prompting "corporate fury" and great pressure to increase regulation of production and distribution of seed.⁸ If this comes at the expense of the point-of-sale regulation that Warangal farmers need, the spurious seed problem will only get worse.



[Spurious seed](#)

These factors that the farmers themselves cite provide a good starting point, but there are much larger forces at work in Warangal, including the emergence of a global corporate agricultural oligarchy, the internationalization of gene patenting and the

poorly understood process of agricultural deskilling (a focus of my own research).

The situation for Warangal farmers and their role in the global war of rhetoric is about to move into a new phase. In March 2002, Bollgard was approved for sale in India. By May, some Warangal farmers will be planting GM seeds in their fields; by this time next year, whatever has happened with the suicide rate, both Monsanto and Vandana Shiva will be claiming vindication. The truth about the effects of Bollgard will be more complex, and the first year will not tell the whole story. Moreover, the effects of Bollgard in Warangal should not be taken as an indicator of GM in general: just as local agrarian situations vary, so will the direct and indirect effects of different GM crops. I see more problems with Bollgard than with other crops being developed in India that are more consistent with agricultural sustainability (although most are coming from the public sector, rather than from the biotech corporations that spend fortunes touting them).

The Warangal case may be unusually distressing, but the struggles between the biotech industry and green activists to interpret problems in culture and agriculture in developing countries are becoming increasingly ordinary. The struggle involves a set of issues of importance in anthropology, and anthropological perspectives are sorely needed in the debate. [2](#)

Notes

* [Addendum November 2003: The figure originally published in *Anthropology News* was 1,000 suicides. After subsequent inquiry I put the figure closer to 600.]

1. Other coverage in western media includes Karp 1998 and Vidal 1999. There has been considerable coverage in the Indian press (e.g., Iyer 1998).

2. Monsanto presses its case on its India website at <http://www.monsantoindia.com>, largely through reposting of selected articles from other publications. Examples on the website in Spring of 1999 included Sun-Sentinel 1999, Times of India 1999, and Farmers' View 1999. For examples of Shiva's use of the suicides see Shiva et al. 1999, 2002. For scholarly analysis of causes behind the Warangal suicides, see Sudarshan Reddy and Rao 1998, Parthasarathy and Shameem 1998, Revathi 1998 and Prasad 1999; Christian Aid 1999 also analyzes the issue. For an example of analysis of agrarian suicides in neighboring areas, see Assadi 1998 and Vasavi 1999.

[Addendum 12 July 2002: a significant study of agrarian suicide in neighboring Karnataka has been published by Deshpande 2002.]

3. However, the Chief Minister of the state of Andhra Pradesh recently ruled out such ex gratia payments on the grounds that they encouraged suicide (Hindu 2002). In March, when a procession of spouses of suicide victims marched on Hyderabad to try to get their ex gratia payments, they were arrested.

4. Quoted in Vidal 1999.

5. Based on farmer interviews; Sudarshan Reddy and Rao 1998; personal communication, Dr. Jala Pathi Rao (director of the Warangal Agricultural Research Station).

6. For China see Pray et al. 2001; for Mexico see Traxler et al. 2001. There are also preliminary reports on South Africa by Ismael et al. 2001 and Bennett et al. n.d.

7. Relevant discussion appears in Tripp 2001; Almekinders and Louwaars 1999; Tripp and Louwaars 1997; Tripp and Rohrbach 2001:159.

8. Jayaraman 2001.

9. Stone 2002 discusses anthropological aspects of the research needed on GM crops for developing countries; what follows is based in part on a synopsis of that discussion.

Seed systems. Marxist analysts see crop biotechnology as a mechanism of capitalist penetration through appropriation of the farmer's control over seed (Goodman et al. 1987; Kloppenburg 1988), and green activists have depicted Indian farming systems as running entirely on saved seed and reciprocal exchanges (e.g., Shiva 2000:8). Industry tends to treat seed provisioning as a system that is, or should be, totally capitalized. Actual smallholder Indian seed systems are more complex. Seed saving is vital in many situations, but it may co-exist with seed sale and even with seed purchase when it could be saved (Tripp and Pal 2001). Strategies for balancing the use value and exchange value of seed are part of what Richards (1989) calls the performance of agriculture.

Social life of GM seeds. There is already rapid spread of unregulated plants in developing countries; the illegal cotton in India and the controversial contamination of Mexican landraces are only two well-publicized examples. Some of the mechanisms of illegal seed transport, including agricultural labor migration, are problems in social ecology.

Skilling and Deskillling. Anthropologists have stressed the vital role of skill in sustainable smallholder agricultural production (Netting 1993), and the importance of social channels for moving the information needed for "skilling" (Richards 1997). Corporate appropriation of elements of the production process may cause deskilling (Fitzgerald 1990; Vandeman 1995), this has certainly happened with pest control among Warangal cotton farmers. How GM crops will affect deskilling and skilling is as much a social question as an agronomic one.



Changing local economic relationships. GM crops may effect not only agronomy, but economic relationships in the countryside. For instance, preliminary reports show economic advantages to Mexican farmers adopting Bollgard, but also that the number of cotton gins has dropped dramatically and all remaining gins have become Monsanto clients, provide information on the farmers (Traxler et al. 2001). Each farmer signs a contract not only to prevent replanting but to control pest management strategies, acreage planted, and where the harvest is ginned. How such changes will affect smallholder operations in the future is an important question.

Affecting the research agenda. Although GM crops tend to be depicted as a monolithic good or a monolithic bad by combatants in the GMO wars (Stone 2002), there is actually enormous variety in the potential effects of various GM crops. On what information will priorities in plant transformations be based? Crops function not just as food but as construction materials, animal fodder, status symbols, ritual items, boundary markers, and statements of ethnic identity. Their roles are not only tied closely to characteristics of other crop plants and intricate details of work rhythms (Stone et al. 1990), but to migration, witchcraft, and gender (Stone 1997, Stone et al. 1995). How these perspectives can be integrated into crop biotechnology research is a crucial challenge facing the discipline (see Busch and Lacy 1983).

References

ALMEKINDERS, CONNY AND NIELS LOUWAARS. 1999. Farmers' seed production: New approaches and practices. London: Intermediate Technology Productions.

ASSADI, MUZZAFFAR. 1998. Farmers' Suicides: Signs of Distress in Rural Economy. Economic and Political Weekly, April 4.

BENNETT, A. L., A. BENNETT, W. GREEN, C. DU TOIT, L. VAN STADEN, T. JOFFE, E. RICHTER, D. BRITS, F. FRIIS AND J. VAN JAARSVELD. n.d. Bollworm control with transgenic (Bt) cotton: First results from Africa. African Entomology, in press.

BUSCH, LAWRENCE, AND WILLIAM B. LACY. 1983. Science, Agriculture, and the Politics of Research. Boulder, CO: Westview.

CHRISTAIN AID. 1999. Selling suicide - farming, false promises and genetic engineering in developing countries. Report by Andrew Simms at <http://www.christian-aid.org.uk/indepth/9905suic/suicidel.htm>.

DESHPANDE, R. S. 2002. Suicide by Farmers in Karnataka: Agrarian Distress and Possible Alleviatory Steps. Economic and Political Weekly 37:2601-2610.

FARMERS' VIEW. 1999. Enlarging The Gene Pool : Environmental protectionism over transgenic plants will harm Indian farming. January 26.

FITZGERALD, DEBORAH. 1990. The Business of Breeding: Hybrid Corn in Illinois 1890-1940. Ithaca: Cornell Univ. Press.

GOODMAN, DAVID, BERNARDO SORJ AND JOHN WILKINSON. 1987. From farming to biotechnology: a theory of agro-industrial development. Oxford: Basil Blackwell.

HINDU. 2002. Naidu rules out ex gratia. 23 March.

ISMAEL, YOUSOUF, RICHARD BENNETT AND STEPHEN MORSE. 2001. Can farmers from the developing countries benefit from modern technology? Experience from Makathini Flats, Republic of South Africa. Crop Biotech Brief 1(5), ISAAA

IYER, LALITA. 1998. Killing men, not pests. The Week, 18 Jan.
<<http://www.the-week.com/98jan18/events4.htm>>

JAYARAMAN, K.S. 2001. Illicit GM cotton sparks corporate fury. Nature 413:555-555.

KARP, J. 1998. Deadly Crop: Difficult Times Drive India's Cotton Farmers To Desperate Actions. Wall Street Journal, 18 Feb 1998.

KLOPPENBURG, JACK RALPH, JR. 1988. First the seed: the political economy of plant biotechnology, 1492-2000. Cambridge: Cambridge University.

LAMBRECHT, BILL. 1998. India Gives Monsanto an Unstable Lab for Genetics in Farming. St. Louis Post-Dispatch 22 Nov.

NETTING, ROBERT MCC. 1993. Smallholders, householders: farm families and the ecology of intensive, sustainable agriculture. Stanford, CA: Stanford, University.

PARTHASARATHY, G. AND SHAMEEM. 1998. Suicides of Cotton Farmers in Andhra Pradesh: An Exploratory Study. Economic and Political Weekly 33(13):720-726.

PRAY, C.E., D. MA, J. HUANG and F. QIAO. 2001. Impact of Bt Cotton in China. World Development 29:1-34.

REVATHI, E. 1998. Farmers' suicide: missing issues. Economic and Political Weekly 33:1207.

PRASAD, C SHAMBU. 1999. Suicide Deaths and Quality of Indian Cotton: Perspectives from history and technology and Khadi movement. Economic and political weekly. 34(5):12.

RICHARDS, PAUL. 1989. Agriculture as Performance. In Farmer First: Farmer Innovation and Agricultural Research, edited by R. Chambers, A. Pacey and L.A. Thrupp, pp. 39-51. London: Intermediate Technology Public.

RICHARDS, PAUL. 1997. "Toward an African Green Revolution? An Anthropology of Rice research in Sierra Leone," in The Ecology of Practice: studies of food crop production in sub-Saharan West Africa. Edited by A. Endre Nyerges, pp. 201-252. Amsterdam: Gordon and Breach.

SHIVA, VANDANA. 2000. Stolen harvest: the highjacking of the global food supply. Boston: South End Press.

SHIVA, VANDANA, A.H. JAFRI, A. EMANI AND M. PANDE. 2002. Seeds of Suicide: the Ecological and Human Costs of Globalization of Agriculture. Research Foundation for Science, Technology and Ecology, New Delhi. (Revised edition of 2000 book by same name.)

SHIVA, VANDANA, ASHOK EMANI AND AFSAR H. JAFRI. 1999. Globalisation and Threat to Seed Security: Case of Transgenic cotton trials in India. Economic and Political Weekly. 34(10):601-613.

STONE, GLENN DAVIS. 1997. Predatory Sedentism: Intimidation and

Intensification in the Nigerian Savanna. *Human Ecology* 25:223-242.

STONE, GLENN DAVIS. 2002. Both Sides Now: Fallacies in the GM Wars, Implications for Developing Countries, and Anthropological Perspectives. *Current Anthropology* 43(4), in press.

STONE, GLENN DAVIS, ROBERT MCC. NETTING AND M. PRISCILLA STONE. 1990. Seasonality, labor scheduling and agricultural intensification in the Nigerian savanna. *American Anthropologist* 92:7-24.

STONE, M.P., G.D. STONE AND R.M. NETTING. 1995. The sexual division of labor in Kofyar agriculture. *American Ethnologist* 22:165-186.

SUDARSHAN REDDY, A AND V. RAO (editors). 1998. The Gathering Agrarian Crisis: Farmers' Suicides in Warangal District (A.P.) India. Unpublished report available at <<http://www.artsci.wustl.edu/~stone/suicide.html>>

TAYLOR, N.J. AND C.M. FAUQUET. 1997. Transfer of rice and cassava gene technologies to developing countries. *Biotechnology International* 1:239-246.

TIMES OF INDIA. 1999. Monsanto's Bollgard: Poison or Panacea? Jan 3.

TRAXLER, GREG, S. GODOY-AVILA, J. FALCK-ZEPEDA, AND J. ESPINOZA-ARELLANO. 2001. Transgenic Cotton in Mexico: Economic and Environmental Impacts. Proceedings of the 5th International Conference on Biotechnology, Ravallo Italy. Also in *Economic and Environmental Impacts of First Generation Biotechnologies*. Edited by Nicholas Kalaitzandonakes, in press.

TRIPP, ROBERT. 2001. Seed provision & agricultural development. London: Overseas Development Inst.

TRIPP, ROBERT, AND DAVID ROHRBACH. 2001. Policies for African seed enterprise development. *Food Policy* 26:147-161.

TRIPP, ROBERT, AND NIELS LOUWAARS. 1997. Seed regulation: choices on the road to reform. *Food Policy* 22:433-446.

TRIPP, ROBERT AND SURESH PAL. 2001. The private delivery of public crop varieties: rice in Andhra Pradesh. *World Development*, in press

TRIPP, ROBERT, AND D. ROHRBACH. 2001. Policies for African seed enterprise development. *Food Policy* 26: 147-161.

VANDEMAN, ANN M. 1995. Management in a Bottle: Pesticides and the Deskilling of Agriculture. *The Review of Radical Political Economics* 27(3):49-55.

VASAVI, A. R. 1999. Agrarian Distress in Bidar: Market, State and Suicides. *Economic and Political Weekly*, April 7.

VIDAL, JOHN. 1999. The seeds of wrath. *The Guardian*, London Saturday June 19.

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