Killing and Poisoning Pests or Human Beings?

acute poisoning of pesticide users through pesticide exposure/inhalation

MARI, Warangal

CSA, Secunderabad
CWS, Secunderabad

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Report Written By: Kavitha Kuruganti

Documentation By: Ch. Sudhakar

Contact Address:

CWS
Centre for World Solidarity
12-13-438
Street No 1, Tarnaka
Secunderabad 500 017
Ph No: 040- 27014300/ 27018257
Email: hyd1_cwsy@sancharnet.in

CSA
Centre for Sustainable Agriculture
12-13-445
Street No 1, Tarnaka
Secunderabad 500 017
Ph No: 040 - 27017735/27014302
Email: csa@csa-india.org

MARI
Modern Architects for Rural India
Behind Ekashila Park
Balasamudram
Hanamkonda 506 011
Warangal District
Ph No: 0870-2571208
Email: marimail@rediffmail.com

Killing and Poisoning Insects or Human Beings?

Chemical Pesticides being a major reason for the spate of suicides in Andhra Pradesh, especially in districts like Warangal, has been well-documented. Pest resistance and resurgence mainly on cotton crop due to an abuse of pesticides, propelled mainly by a lack of regulation of pesticide market where products were extended on credit with high interests by "all-in-one dealers" (money lenders cum dealers of seeds/fertilisers/pesticides) and lack of market support ended up pushing hapless farmers into a vicious debt trap from which suicides were sought as a way out. The same pesticides which proved to be a major cause for their despair were consumed by these farmers to kill themselves.

However, another important aspect of pesticides poisoning and killing human beings is through exposure to the toxic fumes. This is a lesser known and lesser acknowledged aspect of pesticide abuse in places like Warangal in Andhra Pradesh. One of the probable reasons is the prevailing social invisibility of the main affected community – that of dalit agricultural workers who spray the pesticides.

For most farmers and farm workers who are affected by the poisoning from pesticide exposure, it is a routine matter, not worth a special mention. For several of them, recovery from the poisoning is not easy. For the farmers who have engaged the pesticide poisoning victim on a daily wage, it is a matter to be hushed up given its medico-legal implications. For the families surviving a fatal case of poisoning, the loss of a precious bread winner in the family is irreplaceable. For the medical practitioners treating the poisoning cases, it is one more source of income. For the pesticides industry, it is business as usual. Meanwhile, the government chooses to turn a blind eye to the whole issue and would like to blame the victims for ignorance and negligence when it comes to pesticides usage.

The extent of the incidence of poisoning is unclear and there are no efforts from the government to begin any surveys to assess the problem. While precious lives are being lost and maimed due to the pesticide exposure poisoning phenomenon, there are no mechanisms available that provide financial or other support to the victims. Further, there are no preventive measures taken up pro-actively by the government in the form of awareness and education as well as curbs on pesticide production or marketing. The pesticide industry would like to deny this phenomenon and an earlier effort of fact-finding on acute poisoning by non-governmental organisations received a legal notice (threat to sue) from the industry associations. However, the truth cannot be ignored and the industry withdrew its notice soon after.

This report is the result of hospital based documentation, followed by field visits and case study documentation taken up by Centre for Sustainable Agriculture (CSA), Secunderabad with support from Modern Architects of Rural India (MARI), Warangal. Beyond this data lie many unknown and undocumented cases of poisoning that have never reached hospitals. While this report is about acute poisoning through inhalation (effects seen soon after pesticide exposure), there are many other long term effects of pesticides on human health including cancers, reproductive health damage, kidney and liver damage, skin disorders, immune system damage etc. which go unassessed and unreported too.

In this booklet, in addition to information on the cases we have come across, some information on Class I and II pesticides, acute poisoning and its reasons, symptoms, some precautions to be taken during spraying etc., is given. We hope that this booklet will highlight the issue and get the government and the industry to act on the matter.

1. The Cases Of Acute Poisoning In 2004

Centre for Sustainable Agriculture (CSA), Secunderabad and Modern Architects for Rural India (MARI), Warangal began documenting the acute poisoning cases that have reached hospitals in the district of Warangal in Andhra Pradesh during Kharif 2004 in the month of October, 2004. Data was collected upto mid-January 2005, when the spraying time on cotton crop gets over.

Contacts in the form of media reporters and individuals approached several hospitals mainly in the cotton-growing belt of the district to try and get information on the number of hospitalisations due to pesticide inhalation (unintentional), as opposed to pesticide ingestion (intentional). While the former constitute a major occupational hazard for agricultural sprayers, the latter consist of a variety of cases of suicide (or suicide attempts) by way of consumption of pesticides including those attempted by hapless farmers.

Data collection on the subject is not easy – many problems were encountered. The first problem is the suspicion expressed by the people possessing the data. "What do you want the data for, and what will you do with it?" they would like to know. While the hospitals themselves are not monitoring the incidence of such inhalation poisoning, they also do not like the magnitude of the problem being assessed. Secondly, there are administrative hurdles. Unless the Superintendent of the hospital permits, data would not be shared. At the next level, the needed data is not recorded in a ready form. All case sheets have to be pulled out to separate out inhalation cases from ingestion cases – all recorded as OP Poisoning. Beyond this, very little data is actually recorded in the hospital case sheets. There is no information on which pesticide caused the poisoning, how the sprayer used the pesticide, when and for how long did he apply the pesticide etc. Since there are no special monitoring systems for this, this data is considered irrelevant for the medical care to be provided.

With great difficulty, names of the persons admitted for treatment for poisoning due to inhalation have been obtained. We wanted to go and meet the more serious cases for documentation of case studies but the length of stay in the hospital was not shared. Therefore, we limited ourselves to collecting the case studies of victims who met a fatal end due to pesticide exposure. Some cases of severe poisoning but non-fatal cases were also met.

Findings:

Hospitals in Warangal district that have been approached for data on hospitalisations and deaths include:

1 District Hospital	MGM Hospital, Warangal
5 Area Hospitals	Mulugu Hospital Narsampet Hospital Mahbubabad Hospital Eturunagaram Hospital Janagaon Hospital
1 Private Hospital	Parakala

There are other private as well as government Area Hospitals (sub-district level with bed facilities, above the PHC [Primary Health Care Centre] level) in these towns which either have not been approached or where the hospitals were not willing to share information when our persons approached them for this study.

The number of cases of hospitalisations due to pesticide exposure during 2004 in some hospitals of Warangal district

Sl No	Hospital Name	Number of Cases of Hospitalisation
1	MGM District Hospital, Warangal	27 cases
2	Mulugu Hospital, Mulugu	40 cases
3	Narsampet Hospital, Narsampet	68 cases
4	Mahbubabad Hospital, Mahbubabad	35 cases
5	Eturunagaram Hospital, Eturunagaram	05 cases
6	Janagaon Hospital, Janagaon	08 cases
7	Parakala Hospital, Parakala	19 cases
Total		**202 cases**

Some Deaths due to pesticide exposure in 2004 in Warangal district:

Sl No	Name of the victim	Village/mandal	Date of death
1	Kundanapalli Ramulu s/o Venkatramaiah	Khanapur, Narsampet	25/09/04
2	Padala Veeranna s/o Pullaiah	Rajolu, Kuravi	03/10/04
3	Vaddula Venkatreddy s/o Rangareddy	Kambalapalli, Mahbubabad	10/10/04
4	Lingaiah s/o Laxmaiah	Gajulagattu, Gudur	27/09/04
5	Peerilla Lalaiah	Chityala, Eturunagaram	06/05/04
6	Peddaboina Chinna Sammaiah s/o Yakaiah	Eturunagaram	5 months ago, date NA
7	Konne Ramlal Jumki	Konne, Bachannapet	18/06/04
8	Mahasakthi Murali	Adavi Kesavapur, Jangaon	13/08/04

In addition, two other cases from the earlier year came to light during this documentation.

1	Jannu Saraiah	Hasanparthi	08/12/03
2	Boina Sambaiah	Elkurthi Haweli, Geesukonda	31/10/03

These cases present a diverse range of situations even as they bring out some resemblances.

<u>Case of Kundanapalli Ramulu, Khanapur Village</u>

On 23rd September 2004, Kundanapalli Ramulu (45) of Khanapur village in Narsampeta mandal of Warangal district sprayed Hinosan (a Bayer product, with the chemical name being Edifenphos) on his paddy field upto 10 am in the morning with a hand pump before returning home. He had a bath, ate some food and rested for a while. Soon after, he started having problems - vomiting and diarrhea. This went on upto 3 pm. He was then taken to the RMP in Khanapur who referred Ramulu to the Narsampeta hospital. The members of Ramulu's family wanted to take him to the Narsampet hospital but Ramulu assured them that he would be alright soon and that there was no need to rush to the hospital immediately. He suffered all night. The next day, he was taken to the Narsampeta hospital. The doctors there assured him that there was no threat to his life. However, Ramulu's condition deteriorated and he died at around 6 am on the 25th of September 2004.

Ramulu's widow, Padma points out that no one from the government came to visit her after this incident. The family is landless. They were working on half an acre of land that they had leased in. Padma is left with two children – daughter Aruna and son Kiran. The local MLA K Laxma Reddy had recommended Padma's case for financial support from the government. However, nothing has been promised to her so far. The family now has to be supported by her earnings as an agricultural wage labourer.

Case of Vaddula Venkatreddy, Kambalpalli Village

Vaddula Venkatreddy (35) of Kambalpalli village in Mahbubabad mandal of Warangal district died due to pesticide exposure and ensuing severe poisoning in October 2004.

Venkatreddy, who works as an agricultural labourer went to work in the fields of Mittikanti Mohan Reddy and Mittikanti Sudhakar Reddy of his village. For two days prior to his death, he had been continuously spraying pesticides like Hinosan (Bayer's Edifenphos) and Confidor (a Bayer product again). Another sprayer called Mekala Venkanna s/o Ilayya, who had sprayed along with Venkatreddy was also poisoned. However, after being admitted into the Mahbubabad hospital, Venkanna had recovered and he had been subsequently discharged. However, the pesticide exposure in the case of Venkatreddy proved fatal.

Venkatreddy is landless and has three children. The family is very poor. On October 6th and 7th, he sprayed on Mohan Reddy's field, took rest for a day and then resumed spraying on Sudhakar Reddy's lands on the 9th. On that day, even as he was spraying, Venkatreddy started feeling dizzy. Soon he started vomiting. He was made to sleep under a tree and rest instead of being taken to a hospital. When things did not improve, Venkatreddy was given a wash to rid him of any pesticide smell and then taken to the Mahbubabad hospital. On the 10th of October, he died in the hospital while undergoing treatment. His father Rangareddy points out that no government representatives visited the family after the incident.

Venkatreddy's family used to depend on his wage earnings. They live in a thatched hut. His two daughters are aged 12 and 8 years, followed by the son.

The RMPs in the village Mr Krishna and Mr Ayodhya Ramayya point out that nearly ten cases each of poisoning approach them from the village each season. They give the patients first aid treatment and severe cases are referred to the Mahbubabad hospital.

Dr Nehru, Superintendent of Mahbubabad Hospital pointed out that nearly 100 cases of acute poisoning due to pesticide exposure are admitted to his hospital each season.

Boina Sambaiah, Elkurthi Haweli, Geesukonda Mandal

On 31/10/03 Boina Sambaiah went to his field early morning to spray endosulfan and 'hinosan'. He was growing paddy on his 30 *guntas* of land (three quarters of an acre). He mixed the two pesticides and sprayed the mixture. At around 12 O'clock that noon, he breathed his last. When relatives rushed to the field, they found that his clothes were wet with the pesticide and that he had diarrhoea. It was also apparent that he had mixed the pesticides with his left hand and the relatives believe that he might have wiped his face with the same hand when he started sweating. His wife says that he did not smoke or consume alcohol. That day was particularly hot. The local MLA had arranged for five thousand rupees to be released in this case, but this money

did not reach Sambaiah's wife Bhagya. The local administration rejected the family's application for "Apathbandhu" scheme (an accident insurance scheme run by the government).

Padala Veeranna, Rajolu village, Kuravi Mandal

On October 3, 2004, Padala Veeranna died while spraying pesticides. Even though Veeranna owned three acres of land, due to a crisis in his agriculture and the burning down of his house, he decided to work as a labourer with Mekala Ramulu, a farmer in his village. Veeranna has a son and a daughter and the daughter is mentally retarded.

That morning, Veeranna left home early to spray pesticides on Ramulu's field. After finishing spraying on Ramulu's land, Veeranna continued to spray the pesticide in his own field. When he started feeling unwell, he stopped and approached the RMP in the village. However, things did not improve and he had to be shifted to the Mahbubabad area hospital. By that time, Veeranna had slipped into a coma and upon arrival in the hospital, he breathed his last.

Veeranna's wife received no support from the government so far. The house that got burnt, the mentally retarded daughter and the sudden death of her husband leave her with a bleak and hopeless life.

Jannu Sooraiah, Hasanparthi

Sooraiah (45) belongs to Hasanparthi. He was working as a labourer with a farmer called Vengala Sammaiah in his village. On December 8 2003, Sooraiah died while spraying pesticides on a mango orchard. Sooraiah left for work at 8 am that morning, never to return. At around 8 pm that night, neighbors of Sammaiah found Sooraiah lying motionless in the mango orchard and sent word to his relatives. His wife Sarojana bemoans the fact that there was no one else in the orchard that day who could have taken Sooraiah to a hospital in time. The doctors declared that the death was due to exposure to pesticides while he was spraying on the trees high above him, continuously for hours.

The village arranged for some amount of support to be given to the victim's family by the landlord with which Sooraiah's second daughter's marriage was performed. Chandrasekhar, Sooraiah's son, now works as an agricultural worker to support the family.

Some of the cases of poisoning described above from 2003 and 2004 highlight the fact that the victims would mostly be agricultural workers and marginal farmers. The use conditions vary vastly. There are instances of immediate medical attention being received as well as instances of neglect towards the symptoms emerging. Whatever be the case, the common feature that emerges is that there is no support forthcoming from the government in all such cases.

2. The Central Issues Of Concern

"What can we do about it? It is the ignorance and negligence of the user that causes the problem" – this was inevitably the attitude towards the problem from all stakeholders. The pesticide dealers would say this, the agriculture department officials would say this, the doctors would say this and the media representatives we met would say this. Victimising the victim seemed to be the norm. A similar kind of callous approach has been taken towards farmers who have committed suicides in the hundreds thanks to an unfavourable agricultural model thrust on them. And now, here are a set of people who wanted to live, who were trying to eke out a dignified living by putting in agricultural labour and earning their daily wages from doing various operations including spraying of pesticides in agricultural fields….and they get affected in the hundreds, some fatally while many suffer after-effects on their health for a long time.

Health and Medical Care: Each hospitalisation case on an average costs anywhere between Rs. 2000/- to Rs. 20,000/-. Cases that are treated by the local RMPs might cost a couple of hundred rupees. In the case of hospitalisation, there might be a few cases where the farmer who has engaged the farm labourer bears all the cost. But there are scores of other cases where the farmer who has engaged the sprayer bears only a nominal cost of the medical treatment costs while the rest is borne by the victim's family. There are many other cases where it is a small and marginal farmer who was spraying his own crop who got poisoned. Therefore, the medical treatment costs have to be borne by him. At present, there is no financial support available for the treatment costs. The costs incurred in these cases are nearly equal to a whole year's income from an acre of land. This is back-breaking for the farmer. Given this, the situation of the agricultural worker needs no further description. There are also many cases where recovery is never complete and there are persisting and recurring problems connected with the pesticide poisoning. This also means a loss of earning capacities for the family.

At the macro-level, both at the Andhra Pradesh state level and at the national level, there is a pending bill with regard to Agricultural Workers' Welfare. However, no government is getting serious about enacting this legislation which would provide for safe working conditions for the workers as well as healthcare support for them.

Insurance and Economic rehabilitation for victims' families: In the case of death due to pesticide exposure, no social security schemes like *"Apathbandhu"* are being applied. *Apathbandhu* is a government scheme in Andhra Pradesh where insurance cover of upto Rs. 25000/- is being provided for poor victims of accidents. The government and the insurance companies are defining accidents only in terms of fire, natural disasters including lightning etc.

However, there are precedents set by judgements in some Consumer Court cases (For instance, a Consumer Forum case judgement in Warangal district on August 1 2004 awarded one lakh rupees insurance for Y Saraiah of Gurijala village in Chennaraopeta mandal, who died while spraying pesticides on February 8, 2000) where pesticide exposure death has been considered as accidental, worth the support of insurance cover. It is time that the government applied the same principle in all such cases where the pesticide exposure has become fatal and the family had ended up losing its main breadwinner or one of its breadwinners.

Even in non-fatal cases, there are instances where the pesticide-poisoning victim becomes incapable of earning a livelihood. In all such cases, economic rehabilitation for the victims' families is urgently needed. Very often, it falls on the widow of the victim to run the household and any such rehabilitation effort should also take this into consideration.

No awareness on safe use: Studies done earlier have shown that the users often have no knowledge of how to use the pesticide safely. To step back to more basic issues, there is not enough awareness about which pesticide to use, when, in what dosages etc., which forms an integral part of Safe Use.

An unpublished report from a village in Raichur district in Karnataka shows that all the 40 respondents interviewed in the study were unaware of the hazard-level color coding system. They were also unaware of the need to take extra precautions for certain kinds of pesticides, of the need to check for date of expiry on the container etc.

Reports from many parts of India indicate that farmers are indiscriminately using mixtures of pesticides and following the "extension advice" given by dealers and others.

A field investigation carried out with around 300 respondents in six selected districts (Pesticide Hotspots of Guntur and Warangal; Bellary and Raichur; Nashik and Bathinda) of Andhra Pradesh, Karnataka, Maharashtra and Punjab revealed that most of them were less informed about the importance of insecticide formulations, guidelines and dosage details on the insecticide labels or guidelines in the leaflets[1]. Some respondents were not aware of the re-entry interval – that is the time needed for a chemical to dissipate in the environment. According to Rola and Pingali (1993) most of the Organophosphorus and Organochlorine pesticides require an interval of at least 72 hours for dissipation. Farmers in the hotspots were found to enter the pesticide sprayed fields within 24 hours to perform routine farm work.

A majority of the respondents do not follow any of the recommended safety measures while handling pesticides, such as wearing gloves, shoes, face mask and other protective clothing. They found these protective measures uncomfortable in the hot weather and also as a hindrance to their work. In addition, the excessive sweat due to the heat may result in dermal absorption of pesticides. Some farmers also take up spraying activities in the hot sun and irrespective of wind direction. A significant proportion of the respondents 55% in Raichur and Bellary, 42% in Guntur and Warangal and 60% in Nashik use their bare hands while mixing pesticides. Persons who are involved during spraying indulge in extremely dangerous practices of smoking, chewing tobacco and eating which have led to several unintentional poisonings, reports the study.

Safety Measures Adopted While Spraying (percent)

Particulars	Raichur & Bellary	Guntur & Warangal	Nashik	Bathinda
Respondents who do not cover at least their face with a cloth or towel during spraying	38	52	63	34
Respondents who use bare hands for mixing of chemicals	55	42	60	None
Respondents who smoke or chew tobacco during spraying	29	35	37	None
Respondents who are not concerned with direction of wind while spraying pesticides	8	11	5	4

There are no campaigns worth the name taken up either by the government (agriculture department or health department) or the pesticides industry to educate farmers about the general dangers of pesticides, and safety in their use. The pesticide industry would like to make its poisonous products seem safe and effective. The images put out on the mass media including government-sponsored television programmes on agriculture show sprayers using the pesticides

[1] "Socio Ecological Implications of Pesticide Use in India" : Shetty, PK – Economic and Political Weekly, December 4 2004

with great ease, without any protective gear. This ends up giving a wrong impression about the safety of these products.

Even if there was awareness, no safe use conditions possible: As the above study points out and our numerous conversations with farmers and sprayers inform us, even if there was awareness with regard to safe use conditions, these are not possible to follow given our situation. Firstly, the tropical weather does not permit the farmer to work comfortably wearing protective clothing. Also, the poverty situation is such that farmers cannot afford to buy these things and replace them regularly. As is obvious, torn gloves could present more danger if the pesticide enters through the gloves onto the skin of sprayers – mixed with their sweat, dermal penetration might be easier. Similarly, leaking sprayers are a common sight. Farmers do not tend to replace them or get them repaired. Such equipment exposes the sprayers to more dangerous conditions.

On top of these are the social conditions in rural India. High levels of illiteracy prevent a farmer or farm worker from reading instructions on a pesticide container, even if the instructions are properly given. There have been instances reported of such instructions not being present in the local language also! It is then another matter that the instructions are difficult to follow. "See a doctor immediately" is a difficult instruction to follow, for instance, given that such doctors and medical facilities might be miles away[2] or might be inaccessible for other reasons.

An agricultural worker hired on a daily wage basis for a day's work of spraying cannot afford to choose his timings for spraying. He often ends up spraying several tank loads of pesticide throughout the day, including during the hot afternoons. Further, after finishing spraying on a row of the crop along the wind direction, the worker often feels that it is wasteful to walk back to the beginning of the next row so that his spray could follow the wind direction. Often, they end up spraying against the wind direction and with a power sprayer, this implies great jets of the pesticide spray falling back on the sprayer. We have come across instances when the farmers have not revealed to the sprayer what particular pesticide was being sprayed. For instance, "Hinosan" is a dreaded pesticide known for its toxicity. In one instance, the farmer poured the pesticide into another container and gave this to the sprayer to be mixed and used (the farmer did this in case the sprayer refuses to work with this particular pesticide, knowing its dangers). This proved to be fatal for the sprayer who died later due to exposure.

There are other practical problems related to lack of adequate quantities of water etc., in the field situation. There are instances of farmers/workers mixing with their bare hands before filling the sprayer-tank. Sprayers find themselves keeping their lunch/food in one corner of the field where the spraying is taking place, wash with whatever little water is available and then proceed to eat the food. Often, they also do not get to have a full wash at home either.

The fact that there are plenty of images and messages contrary to the awareness of users with regard to the dangers of pesticides is something worth noting. The awareness with regard to the hazards gets negated or nullified in practice given that there are not enough images/messages that reinforce such an awareness. On the contrary, there are many images/messages through several communication channels that seem to tell the user that pesticides can be used indiscriminately and in any conditions.

The central question therefore is can we really ensure safe use conditions even if awareness was to be generated or is it best to remove at least the more toxic pesticides from the scene to begin with?

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[2] "Reducing Acute Poisoning in Developing Countries: Options for restricting the availability of pesticides", Konradsen et al, Toxicology 192 (2003), pp 250

Pesticides banned in other countries still manufactured and sold here: India does not have a rational pest management policy or pesticide policy. While Integrated Pest Management is the official policy, the use of pesticides in practice nowhere reflects the adoption of such a policy. Many pesticides that have been banned or severely restricted in other countries continue to be produced and marketed here and some of these top the list of highly-consumed pesticides in the country. These include several Class I and Class II pesticides as per the WHO classification (more on this in another part of this report).

An international agreement has been evolved under the auspices of Food and Agriculture Organisation [FAO] called the International Code of Conduct on the Distribution and Use of Pesticides (adopted by the 123rd session of the FAO Council in November 2002) to which India is a signatory. Moreover, the pesticides industry has also agreed to abide by this Code which is a voluntary code. This Code says through its Clause 7.5 that "prohibition of the importation, sale and purchase of highly toxic and hazardous products, such as those included in WHO classes Ia and Ib may be desirable if other control measures or good marketing practices are insufficient to ensure that the product can be handled with acceptable risk to the user".

India continues to produce and sell pesticides like triazophos, edifenfos, methyl parathion, oxydemeton-methyl, quinalphos, endosulfan, monocrotophos which are often cited as the more toxic pesticides which could result in "reaction" by the farmers' themselves. Unlike other countries like Norway or Denmark or even Syria, India would like to continue with pesticides registered even decades ago, even if they have been proven to be a danger to the ecology and human health. Banning a pesticide in India is a tedious procedure without any automatic de-registration. Moreover, several reports indicate the strong nexus that exists between the regulatory authorities and the pesticides industry which makes such de-registrations/bans very difficult to be brought about.

However, it has to be pointed out here that even the so-called new generation and safer pesticides are ending up causing acute poisoning in some cases. "Avaunt" (Indoxacarb) and "Confidor" (Imidacloprid) have also been documented as causing acute poisoning at times.

No assessment of the extent of the problem – no records maintained: In 2001, documentation of acute poisoning during the Kharif season by Andhra Pradesh Rythu Sangam (a large farmers' union in Andhra Pradesh) and some non-governmental organisations made the district officials in Warangal realise the probable magnitude of the problem. One of the demands from the activists was that the government initiate a survey and set up systems that would record the extent of the problem even as it should rehabilitate known cases.

However, there is no department which is monitoring acute poisoning in any systematic manner, as our survey showed. Our discussion with the agriculture department officials revealed that they were only recording farmer-suicide cases, that too in case claims are made for compensation at a later date. For the health department, this does not constitute a public health issue even though hundreds are falling victim to pesticide inhalation poisonings. They are neither recording the incidence of the problem nor takng up any pro-active steps to prevent the phenomenon from occurring widely or for effective treatment. For the pesticide industry including its dealers, monitoring the use of their products does not seem to be an area of concern. Their interest of having sold poisonous products has been met once such products are purchased by the farmers. There is no accountability that the industry exercises for the actual use and repercussions of pesticides.

Even if we assume that hospital-based surveillance records can serve the limited purpose of projecting a picture about the problem (which hospitals are getting most of the cases, which pesticides are mostly implicated, which symptoms mostly reported etc. etc.), such maintenance of records has been glaring in its absence. Hospitals maintain their case records and all data has to be extracted by going through the records case by case to separate out inhalation cases (unintentional poisoning) from ingestion cases (intentional poisoning). There is no separate system for monitoring unintentional poisoning incidence. The farmer unions and local organisations have been caught up in other crises that constantly erupt in their areas of work, and monitoring by such agencies was lacking too.

Nobody, in the government or outside it, is unable to present an accurate picture (or as accurate as it could get) about the extent of the problem but indications from perusal of various reports – which could be grossly under-reporting the situation – is that the number of victims of pesticide poisoning runs into hundreds in Warangal district alone while the fatal cases could run into scores.

Apprehensions about medico-legal aspects – hushing up of cases: Conversations with farming community members in the pesticides hotspots reveal that many cases of poisoning are hushed up as there are medico-legal aspects. Only serious cases get reported to the hospitals. Many also turn to private hospitals either to avoid the medico-legal complications or because they want a quicker and more effective treatment. Only in fatal cases does a post-mortem get done where the full report emerges. Here, the *panchnama* statement also records the actual circumstances of the poisoning.

Many farmers who employ agricultural workers do not want to be implicated in poisoning cases of their sprayers. In some villages where the feudal structures are strong, there is a tendency to hush up all such cases and report that there are no such poisonings in the village. This further contributes to under-reporting of the problem.

Aggressive marketing of pesticides: While talking about the many facets to this problem, the issue of aggressive marketing by the industry cannot be over-stated. Even the most toxic of pesticides is aggressively marketed. Dealers would like to promote those pesticides which offer them the most incentives. They in turn offer a variety of incentives to farmers including prizes in lucky draws etc. In addition to wall posters, marketing of pesticides is being done on popular vernacular television channels, through newspapers and through village level campaigns.

Marketing by the industry does not ever highlight the dangers, or the precautions to be taken, or the symptoms to watch out for, for obvious reasons. The central question therefore is, should products which are essentially poisonous be allowed to be marketed thus?

Existing social problems aggravate the situation: the poverty of agricultural workers and their malnourishment aggravates the situation with regard to pesticides and their health effects.

The feudal relationship between landowners and workers in many parts of the country mean that the effects of the pesticide on the worker could be neglected or discounted. There is also much under-reporting of poisoning cases due to this.

Widespread illiteracy and lack of education mean that agricultural workers cannot read the danger warnings on the pesticide container, the medical advice, the dosage to be used, the recommended conditions of use etc. While the whole problem is conveniently thrust back on the victims of poisoning on grounds of ignorance, the given situation is such that it cannot be remedied in a hurry.

Agricultural workers in the country are also very unorganised and therefore are not in a position to fight for their rights including health care and accident/insurance coverage. No legislation exists specifically for their welfare in India.

3. Earlier Reports On Acute Poisoning

Agri-chemicals pose the greatest occupational hazard in the field of agriculture and annually, millions of agricultural workers are estimated to be poisoned by pesticides across the globe.

It was estimated that three million reported cases of pesticide-associated acute poisoning occur annually resulting in 220,000 deaths[3]. 99% of these occur in the developing world in spite of these countries accounting for only 20% of global pesticide use.

In 1990, the World Health Statistics Quarterly reported that an estimated 25 million agricultural workers are poisoned by pesticides every year[4]. According to estimates made in 1994, there were 2 to 5 million annual occupational cases of poisoning across the world, with 40,000 fatalities[5].

According to Pesticides Action Network Asia and the Pacific, the numbers are higher. It is estimated that around 200,000 people are killed worldwide every year from pesticide poisoning. Daily, 68,000 farmers and workers are poisoned by pesticides and yearly, an estimated 25 million workers suffer pesticide poisoning around the world.

An idea about the situation in developing countries can be had from the following estimates[6].

- In 2000, Brazil's Ministry of Health estimated that the country had 300,000 poisoings every year and 5000 deaths from agricultural pesticides.

- In an Indonesian study, 21% of spray operations resulted in three or more neuro-behavioural, respiratory and intestinal signs or symptoms.

- In a UN survey, 88% of pesticide using Cambodian farmers had experienced symptoms of poisoning.

There is very little India-specific data on the annual incidence of acute poisoning amongst agricultural workers and fatal cases amongst them.

A fact-finding report in January 2002 called "Killing Fields of Warangal: Farmer deaths due to exposure to pesticides in Warangal district" estimated that there could be more than 500 deaths in Warangal district (due to pesticide poisoning) and more than 1000 exposed in the period between August and December 2001. The widespread poisonings in that year were also documented by the Andhra Pradesh Rythu Sangam, a farmers' union in the state of Andhra Pradesh. Through their documentation, they also got the office of the Joint Director of Agriculture to collect records of such poisonings in that year. The fact finding report followed these reports.

In 2003, Greenpeace India had collected acute pesticide poisoning data from three villages of Atmakur mandal of Warangal district and found that in a 3-year period, nearly 45 cases of accidental exposure-related poisonings happened in these villages. 71% of these cases were from Organophosphorus pesticides. This data, when extrapolated to the whole block of Atmakur and the whole district of Warangal presents a shocking picture of hundreds of cases of acute poisoning every year.

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[3] "Public Health Impacts of Pesticides Used in Agriculture" - WHO/UNEP working group, 1990

[4] "Acute Pesticide Poisoning: a major global health problem", Jeyaratnam, J. *World Health Statistics Quarterly* 43: 139-144, 1990

[5] "Chemicals in the working environment", World Labour Report, ILO, 1994

[6] "What's Your Poison? Health threats posed by pesticides in developing countries", Environment Justice Foundation, London, 2003

4. About Acute Effects of Pesticides[7]

Pesticides are chemicals that by design are meant to kill or harm living organisms. Anything that can kill or harm other living organisms has the potential to harm or kill human beings too.

The effects of pesticides on human health have generally been classified into two broad impacts: 1. acute effects and 2. chronic effects. The factors that contribute to the impact of pesticides on human beings are mainly three[8], presented here in layperson terms:

- how hazardous or poisonous a pesticide is, meaning the toxicity (the less it takes to kill, the more toxic), most popularly understood by the WHO classifications[9] – incidentally, this is not about long term effects
- how pesticides get into the body (by inhalation, by ingestion/swallowing, by dermal contact or exposure or through the eyes)
- how long the pesticides stay in the body (organochlorines for instance, take a longer time to break down; also, children and women have less efficient detoxifying mechanisms).

Acute or Immediate effects: These are effects seen within a very short time after exposure to pesticides. After pesticides go through the skin, they get into the blood stream and go throughout the body and once they get into the system, they can cause poisoning. Signs and symptoms of systemic poisoning include headaches, dizziness, nausea, vomiting, cramping, breathing difficulties and blurred vision. If the poisoning is severe and proper treatment is not available, death can occur.

Acute poisoning can be categorized on a severity scale of Mild, Moderate and Severe, based on the symptoms manifested after poisoning. The manifestations, clinically can also be classified mainly as three categories:

- Muscarinic signs (salivation, tearing, sweating, nausea and vomiting, diarrhoea, respiratory secretions, chest tightness and so on),
- Nicotinic signs (voluntary muscle weakness, voluntary muscle fasciculations, paralysis etc.) and
- Central Nervous System/CNS signs (headache, anxiety, confusion, seizures, stupor, coma etc.)[10].

The most common acute effects are irritation of the eyes, nose and throat, such as tearing, stinging, burning, coughs, skin rashes, itching etc.

The way in which pesticides are applied has a very strong bearing on the degree of hazard. If workers carry spraying equipment on their backs, they are very close to the source of exposure. Changes in the wind direction during spraying may result in absorption by the respiratory tract, and leakages from joints in the equipment cause workers to come into direct skin contact with large amounts of pesticide.

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[7] This section is extracted from "Arrested Development", a report on Pesticides and their impact on the developmental abilities of children, Greenpeace India, 2003

[8] "Pesticides – Killers in our midst", from "Warning: Pesticides are dangerous to your health", Dr Moses, Marion: Pesticide Action Network Asia and the Pacific, November 1999

[9] WHO classification measures acute toxicity and Class Ia and Ib are the most toxic, classified respectively as Extremely Hazardous and Highly Hazardous pesticides

[10] "Monitoring the effects of pesticide exposure": Schumann, Steven, Occupational Health Research, 2002

While the various potential effects of pesticides are being mentioned here, it is very important to note that only some effects are known of only some chemicals that we are exposed to. For instance, in India, the health and environmental effects of less than 50 percent of the registered pesticides are known. Compounding the problem is the fact that individual active ingredients are tested for their toxicological and other effects whereas the effects of the 'solvent' used for the formulations or the formulations themselves are not put through these tests. And worse yet is the reality of an individual being exposed to a cocktail of known and unknown pesticides at any point of time. The possible synergistic effects of these combined and mixed exposures have never been studied. This situation of multiple exposure is dismally addressed by the current regulations. Even where toxicological tests are conducted, there has been more than ample research and documentation done about the sheer inadequacies of such tests even in the developed world.

When it comes to acute poisoning, much of the data is from hospital records, in addition to some documentation by agencies like the National Institute of Occupational Health (NIOH). The Poison Information Centre in NIOH, Ahmedabad reported that OP (organophosphorus) compounds were responsible for the maximum number of poisoning (73%) among all agricultural pesticides[11]. In a study on patients of acute OP poisoning (n=190), muscarinic manifestations such as vomiting (96%), nausea (82%), excessive salivation (61%) and blurred vision (54%), in addition to CNS (Central Nervous System) manifestations such as giddiness (93%), headache (84%), disturbances in consciousness (44%) were the common symptoms[12].

However, hospital records maintained in this country do not make a distinction between intentional poisoning and occupational/ accidental exposure to pesticides. There is a recognition that hospital-based surveillance systems also tend to underestimate and under-report the true picture of pesticide poisoning cases in the field. In fact, a few pilot studies taken up by the World Health Organisation and the International Program for Chemical Safety (IPCS) under their "Epidemiology of Pesticide Poisoning Programme" ended concluding that occupational and accidental exposure accounted for only a small proportion of poisonings in the surveys taken up[13].

Most serious poisonings and deaths from pesticides occur in developing countries. Nearly three-quarters of a million chemicals and chemical compounds are in use in agriculture throughout the world — and several thousand new ones appear on the scene every year. They are introduced into the production process so quickly there is little time to assess their potential harm to workers. In 1991 only 20 per cent of the world's pesticides were used in developing countries, yet they accounted for 99 per cent of the poisonings arising from their use[14]. It is important to mention here that India continues to allow production, marketing and use of certain Class I pesticides in the country – these include methyl parathion, phorate and phosphamidon in Class Ia (Extremely Hazardous), Oxydemeton-methyl, edifenphos, methamidophos, methomyl, monocrotophos etc., in Class Ib. In addition, many moderately hazardous (WHO Class II) pesticides are also implicated in earlier studies and reports of acute poisoning: these include, carbaryl, cypermethrin, endosulfan, fenvalerate, profenophos, quinalphos etc.

[11] "Acute poisonings due to agricultural poisonings reported to the NIOH Poison Information Centre": Dewan, A and Saiyed, H N, National Institute of Occupational Health, Ahmedabad, Page 136, 1998
[12] "A clinical, biochemical, neurobehavioural and socio-psychological study of 190 patients admitted to hospital as a result of acute organophosphorus poisoning": Agarwal, S.B., Environ Res 62-63, 1993
[13] "Estimating the global impact of Acute Pesticide Intoxication": A protocol for Community Based Surveillance: Corbett, Stephen and Zuo, Yeqin, November 2002: an unpublished document
[14] "Safety and Health in Agriculture", International Labour Conference 88th Session, ILO report, June 2000

Here, it should also be added that some of these pesticides are so dangerous that there is no situation where they could be safely used in agriculture. The only way to deal with them is to eliminate their production and use. The Food and Agriculture Organisation of the UN (FAO) recommends that WHO Ia and Ib pesticides should not be used in developing countries, and if possible class II should also be avoided.

5. Class I And Class II Pesticides

This is a widely accepted classification given by World Health Organisation since 1975, based on the hazard level of various pesticides. LD_{50} calculations (value from a statistical estimate) of human toxicity level based on experiments with rats are done for the purpose of this classification. It is the number of milligrams of toxicant per kilo of body weight required to kill 50% of a large population of test animals. The classification is done of the common name/chemical name/generic name of pesticides in terms of their potential human health effects. These classifications are usually based on the "acute oral LD_{50}" levels. This classification is of the active ingredients in the technical grade material. This forms the basis for the final classification of an actual formulation. It has to be remembered here that in addition to the active ingredient, sometimes, solvents or vehicles may pose a greater threat too.

The hazard referred to in this Recommendation is the acute risk to health (that is, the risk of single or multiple exposures over a relatively short period of time) that might be encountered accidentally by any person handling the product in accordance with the directions for handling by the manufacturer or in accordance with the rules laid down for storage and transportation by competent international bodies.

The classification distinguishes between the more and the less hazardous forms of each pesticide in that it is based on the toxicity of the technical compound and on its formulations. In particular, allowance is made for the lesser hazards from solids as compared with liquids. The classification is based primarily on the acute oral and dermal toxicity to the rat since these determinations are standard procedures in toxicology.

Class Ia	Extremely Hazardous (red triangle)
Class Ib	Highly Hazardous (yellow triangle)
Class II	Moderately Hazardous (blue triangle)
Class III	Slightly Hazardous (green triangle)
O	Hazard unlikely if used safely

The table below gives more information on the acute toxicity calculations and classification[15].

Class	LD_{50} for the rat (mg/kg of body weight)			
	Oral		Dermal	
	Solids	Liquids	Solids	Liquids
Ia Extremely Hazardous	5 or less	20 or less	10 or less	40 or less
Ib Highly Hazardous	5-50	20-200	10-100	40-400
II Moderately Hazardous	50-500	200-2000	100-1000	400-4000
III Slightly Hazardous	Over 500	Over 2000	Over 1000	Over 4000

The terms "solids" and "liquids" refer to the physical state of the active ingredient being classified.

[15] "The WHO Recommended Classification of Pesticides by Hazard and Guidelines to Classification 2000-2002", International Programme on Chemical Safety, WHO/PCS/01.5

If the active ingredient produces irreversible damage to vital organs, is highly volatile, is markedly cumulative in its effect, or is found after direct observations to be particularly hazardous or significantly allergenic to man, then adjustments to the classification can be made by classifying the compound in a class indicating a higher hazard. Alternatively, if it can be shown that the preparation is less toxic or hazardous than expected from consideration of the LD50 values of the ingredient or ingredients, or for any other reason, adjustments should be made by classifying the compound in a class indicating a lower hazard.

Labels of products classified in classes Ia and Ib should bear a symbol indicating a high degree of hazard (usually a type of skull and crossbones) and a signal word or phrase, e.g. POISON or TOXIC. The presentation of the symbol and word or phrase, in terms of colour, size and shape should ensure that they are given sufficient prominence on the label. The text should be in the local language and for all formulations should include the approved name of the active ingredient or ingredients, the method of use, and precautions to be taken in use. For classes Ia and Ib, symptoms and immediate treatment of poisoning should also be included.

Class Ia (Extremely Hazardous denoted by the red triangle) in India consists of :

- Aldicarb,
- Bromadiolone,
- Captafol [carcinogen and also part of the Prior Informed Consent (PIC) list of the Rotterdam Convention],
- Methyl Parathion [part of the PIC list],
- Phorate,
- Phosphamidon [in the PIC list][16]

Class Ib (Highly Hazardous, denoted by the yellow triangle) in India consists of

- Carbofuran,
- Chlorfenvinphos,
- Coumatetralyl,
- Dichlorvos,
- Edifenphos,
- Methomyl,
- Monocrotophos (in the PIC list),
- Oxydemeton-methyl,
- Propetamphos,
- Sodium Cyanide,
- Triazophos,
- Warfarin and
- Zinc Phosphide.

Class II (Moderately Hazardous, denoted by the blue triangle) in India consists of

- Anilofos,
- Carbaryl,
- Chlorpyrifos,
- Copper Sulphate,
- Cuprous Oxide,
- Cyfluthrin,
- Cypermethrin,

[16] Compiled from "Major Uses of Pesticides registered under the Insecticides Act 1968", Govt of India Ministry of Agriculture, Directorate of Plant Protection, Quarantine and Storage, 1997

- 2,4-D,
- Endosulfan,
- Ethion,
- Fenitrothion,
- Fenobucarb,
- Fenthion,
- Fenvelarate,
- Imidacloprid,
- Lambda-cyhalothrin,
- Metaldehyde,
- Permethrin,
- Phenthoate,
- Phosalone,
- Profenofos,
- Pyrethrins,
- Quinalphos,
- Trichlorfon,
- Tricyclazole and
- Tridemorph.

Acephate and Dicofol form part of the "Slightly hazardous" group (Class III) but are implicated in acute poisonings documented by civil society.

While a few of the above pesticides are little known and little used, a majority are consumed in high volumes across different crops in the country. Many are known by their brand names also, mostly in the case of multinational corporation products. For instance, Metasystox (Oxydemeton-Methyl of Bayer), Metacid (Methyl Parathion of Bayer), Hinosan (Edifenfos of Bayer), Ekalux (Quinalphos of Syngenta), Thiodan (Endosulfan of Bayer) etc., are popularly used by farmers.

The above list of around 45 pesticides constitutes some of the most-consumed pesticides in this country by volume including monocrotophos, phorate, quinalphos, endosulfan etc. They also form a significant proportion of the overall number of pesticides registered in the country.

Many of these pesticides have been banned in other countries, especially in the developed world. As per the government's own admission, the following 32 pesticides banned or severely restricted in some countries of the World are still used in India.

List of Pesticides which have been Banned/Severely Restricted in Some Countries of World but are still being Used in India (2002)		
Aluminium Phosphide	Methomyl	Endosulfan
Benomyl	Methoxy Ethyl Mercury Chloride	Fenarimol
Captan	Methyl Parathion	Fenpropathrin
Carbaryl	Monocrotophos	Lindane
Carbofuron	Oxyfluorfen	Linuron
Carbosulfan	Paraquat Dichloride	Malathion
Dicofol	Phorate	Triazophos
DDT	Phosphamidon	Tridemorph
Dimethoate	Pretilachlor	Thiomethon
Diuron	Sodium Cyanide	Thiram
Zinc Phosphide	Ziram	

Source : Lok Sabha Unstarred Question No. 2291, dated 18.03.2002.

Another compilation, created by Centre for Indian Knowledge Systems (CIKS, Chennai) of banned/ restricted pesticides in the West, still widely used in India gives the following picture (in 1994-95, in tonnes) :

Pesticide	Use in Agriculture	Use in Public Health
BHC	24000	6305.00
DDT	280	8181.25
2,4-D	1200	---
Dichlorovos (DDVP)	1500	---
Dimethoate	1900	---
Endosulfan	4600	---
Methyl Parathion	2600	---
Lindane	50	---
Monocrotophos	6296	---
Mancozeb	4000	----
Paraquat	400	---
Total such usage	46826	14486.25
Total usage of pesticides	86311	15327.25
% use of severely restricted or banned pesticides	54.25%	94.5%

Many of the more toxic pesticides are OP pesticides. Organophosphates (OPs) are the most widely used group of insecticides in the world and many of these do not appear on restricted lists. They are among the most acutely toxic of all pesticides to both insect pests, and to vertebrate animals and humans. OPs are hazardous both to professional and amateur users. They are regularly detected in food items such as fruit and vegetables, and occasionally occur above a safety level known as the acute reference dose (an estimate of a daily oral exposure to the human population [including sensitive subgroups] that is likely to be without an appreciable risk of deleterious effects during a lifetime.

6. Acute Poisoning – Its Common Symptoms

Dizziness, fatigue, runny nose or eyes, excessive salivation, excessive sweating, twitching eyelids, sore throat, cough, stomach pain/cramps, itchy skin, skin rash, muscle cramps, tongue numbness, nausea, stinging/itching eyes, intestinal discomfort, sweating, changes in heart rate, chest pain, respiratory congestion, diarrhoea, blurred vision, insomnia, muscle twitching and shivering, joint pain, paralysis, seizures, loss of consciousness, vomiting, coma and even death.

Each pesticide generally belongs to a chemical family on which general health effects are known.

- Organophosphates: disturbs the peripheral nervous system – long acting
- Carbamates: disturbs the peripheral nervous system – short acting
- Organochlorines: disturbs the central nervous system – long acting
- Pyrethroids: irritant to eyes, skin and respiratory tract

Organophosphates: These are usually pesticides that have "os" or "on" suffixes. These include pesticides such as methyl parathion, monocrotophos, chlorpyrifos, quinalphos, ethion, malathion, profenofos, edifenfos, oxydemeton-methyl, triazophos etc. OPs are effectively absorbed by inhalation, ingestion and skin penetration. They affect the Central Nervous System (brain) and peripheral nervous system. Organophosphates attach themselves to the enzyme acetylcholinesterase that stops nerve transmission. This is the enzyme that breaks up acetyl choline (which acts as a bridge transmitting electrical charge to the muscle/gland cells) into acetate and choline. Once acetylcholine is broken it can no longer transmit electrical nerve impulses and the muscles and glands become quiet. However, many pesticides are acetylcholinesterase inhibitors. Therefore, there is suppression of the enzyme and continuous electrical nerve transmission. This particularly affects the muscles, glands and smooth muscles that make the body organs function. Symptoms might start about 30 minutes after exposure. Some organophosphates like methyl parathion also have significant lipid solubility (fat solubility) allowing fat storage with delayed toxicity due to late release.

General Central Nervous System	Fatigue Dizziness Headache Hand tremors Staggering gait Convulsions Loss of consciousness Coma
From muscle over-stimulation	Muscle weakness Muscle cramps Twitching eyelids
From gland over-stimulation	Salivary gland – excessive salivation Sweat gland – excessive sweating Lacrimal gland – excessive eye watering
From organ over-stimulation	Blurred vision (constricted pupils) Stomach cramps Nausea Vomiting Diarrhoea Chest tightness Wheezing Cough Running nose

Because they share this mechanism of cholinesterase inhibition, exposure to the same organophosphate by multiple routes or to multiple organophosphates by multiple routes can lead to serious additive toxicity. It is important to understand that there is a wide range of toxicity in these agents and wide variation in cutaneous absorption.

Carbamates behave the same way as the Organophosphates in that they suppress Acetyl Cholinesterase and cause over-stimulation of the nerves. The effect however comes sooner after exposure, as fast as 15 minutes. Symptoms are the same as with OP pesticides except that the following rare symptoms might also occur: convulsions, loss of consciousness, coma. Some examples of Carbamates are: aldicarb, carbaryl, carbofuran, methomyl etc.

Organochlorines affect the central nervous system. They are absorbed by fat and can stay in the body for a longer time. As fat cells are present in breast tissue, organochlorines also end up in mother's milk. Acute effects can begin within one hour after absorption. Organochlorines like endosulfan are rapidly and easily absorbed through the skin. There may not be over-stimulation of glands and organs, but symptoms could be related to disruption of the central nervous system. These include:

- Muscle weakness
- Dizziness
- Headache
- Numbness
- Nausea
- Loss of consciousness
- Convulsions
- Vomiting
- Hand tremors
- Staggering gait
- Anxiety/restlessness
- Confusion and disorientation

Some of the commonly known and used organochlorine pesticides are endosulfan, DDT, dicofol, lindane etc.

Pyrethroids are irritants to the eyes, skin and respiratory tract. Symptoms could include:

- Numbness (hypersensitivity of skin)
- Shortness of breath/wheezing
- Dry throat
- Sore throat
- Burning nose
- Itching skin
- Vomiting
- Diarrhoea
- Excessive salivation
- Twitching eyelids
- Staggering gait
- Irritability
- Loss of consciousness/coma
- Convulsions

Synthetic pyrethroids commonly known and used include fenvalerate, cypermethrin, deltamethrin, alphamethrin etc.

Some issues related to acute poisoning signs and symptoms:

Acute effects can be delayed by up to four weeks and can include cramping in the lower limbs that leads to lack of coordination and paralysis. Improvement may occur over months or years, but some residual impairment may remain[17].

Farmers tend to create their own mixtures of pesticides and the effects of such mixtures have not been, and cannot be assessed given the millions of combinations possible. Recent research has shown that when pesticides are mixed together, they can be 10 times more toxic than individual chemicals[18].

Most pesticide-related diseases appear similar to common medical conditions and there is a general failure by doctors to recognise pesticide poisoning[19]. In one review of medical records of 20 severely pesticide-poisoned infants and children transferred to a major medical centre in California from other hospitals, 16 were found to have been wrongly diagnosed at the time of transfer. If this could be the case in a developed country like the USA, the situation in a country like India could be imagined where health personnel are inadequate in numbers and inadequately trained.

There is also another related issue – that of farmers discounting or ignoring symptoms or the seriousness of the situation. Some of them try to address the situation by drinking butter milk or by trying to rest for a while. Inaction at the appropriate time could prove to be fatal especially if healthcare facilities are inaccessible. Such inaction also results in much under-reporting of the phenomenon.

[17] EXTOXNET: Pesticide Information Profiles: http://ace.orst.edu/info/extoxnet/pips/ghindex.html
[18] http://news.bbc.co.uk/l/hi/england/1687795/html
[19] "What's Your Poison? Health Threats Posed by Pesticides in Developing Countries" Environmental Justice Foundation, London, 2003

7. Common Advice On Precautions To Be Taken With Pesticide Use

Pesticide sprayers are commonly advised to take the following precautions:

- use pesticides only when needed and use only appropriate pesticides, in the recommended dosages; all insects on the crop are not pests
- avoid using Class I and Class II pesticides; the color code on hazard levels will guide you through this
- do not use the same pesticide again and again just because it is found to be effective; this will prove to be ineffective in the long run
- granular formulations are safer to handle than liquid formulations
- do not buy expired products
- do not buy leaking products or tampered products (stains, rusted container, broken seal, loose lids etc.)
- buy your pesticide from an authorised dealer, along with a proper bill
- do not break the manufacturer's product into smaller quantities for repacking and carrying to the field or for use later on; buy as much as is needed
- after purchase, store the pesticide containers away from the reach of children
- always read the product label and follow the instructions
- do not open the seal with your mouth
- if you are ill, do not spray pesticides
- wear protective clothing to protect yourself from exposure to pesticides through the skin or through inhalation – the clothing should cover the full length of arms and legs, the head and the neck and should cover the nose.
- after spraying, wash your body thoroughly with soap
- change and wash clothes immediately after spraying
- spray only in the direction of the wind, even if it means walking back to the next row of plants, after spraying one row, and beginning again
- wear safety equipment like a face mask, gum boots, gloves, apron etc.
- do not ever mix with bare hands; use a long stick for mixing and mix only in an open place; gloves must be worn for handling and mixing of pesticides
- do not create mixtures of pesticides and use them
- do not eat, drink or smoke during, or immediately after use of pesticide
- keep your food and water away from the spray in the fields
- do not eat food with hands contaminated from spraying
- do not use leaking sprayers
- always spray only during early mornings and late afternoons. Do not spray during the hot afternoon
- watch out for any poisoning signs or symptoms and rush to a doctor immediately in case of experiencing any symptoms

OUR RECOMMENDATIONS AND DEMANDS

Given the wide extent of acute poisoning and the related socio-economic problems, we strongly demand the following:

To the government:

- acknowledge the threat and that the problem exists
- assess the extent of the problem
- raise awareness about the dangers through well-financed education campaigns
- ensure the dissemination of information on ill effects of pesticides to all users
- in the short term, use can be reduced through improved equipment and the situation improved through some precautions followed
- highlight the problems posed by cocktail mixtures and their use
- fix liability and get compensation to be paid for medical care and economic rehabilitation for all victims – get the industry to pay up; if not, the government to pay
- ban all class I a, I b and II pesticides
- modify pesticide risk assessment procedures – bring in the precautionary principle
- promote better and safer agricultural practices including NPM approach and organic farming
- curb aggressive marketing by pesticide industry

With the health sector:

- train and equip health sector staff and infrastructure to identify and deal with such cases
- set up systems for regular and proper monitoring

To the Industry:

- pay compensation to all the farmers affected
- pro-actively withdraw all Class I and Class II products from the market
- stop practicing double standards
- pesticide containers to contain explicit warnings and other information….
- stop aggressive marketing

Annexures

Cases of Hospitalisation from MGM Hospital in 2004 due to Pesticide Exposure

Sl No	Name of the victim	Village	Mandal
1	Gandrathi Laxmaiah	Pegadapalli	Hasanparthi
2	Muttu Prasad	Gudimaheshwaram	Duggondi
3	Chatrashi Raju	Mustalapalli	Atmakur
4	Maduri Manemma	Annaram	Parvathagiri
5	V Nagesh	Dharmaram	Geesukonda
6	Rapal Sadanandam	Vanamala	Kanparthi
7	Topucharla Sudhakar Rao	Ramchandrapuram	Sangem
8	Keshaboina Bhaskar	Bollikunta	Sangem
9	Kanakada Sammaiah	Madipalli	Hasanparthi
10	Addi Laxmi	Ashalapalli	Sangem
11	Purella Kumar	Pedda Pendyala	Dharmasagar
12	Dowdar Sarvaiah	Geesukonda	Geesukonda
13	Anumula Ramana	Akkampeta	Atmakur
14	Chatla Bhikshapathi	Punnelu	Wardhannapeta
15	Doubu Yellaswamy	Geesukonda	Geesukonda
16	Manda Bhikshapati	Elukurthy	Geesukonda
17	Bokka Bobbili	Siddapuram	Hasanparthi
18	Mathor Laxman	Nered	Koravi
19	Sandasani Shivudu	Perlapalli	Kamalapur
20	Budhe Chandraprakash	Arepalli	Hanamkonda
21	D Mallaiah	Pulukurthi	Atmakur
22	Kalwa Rajaiah	Kamlapur	Kamalapur
23	Masumpalli Raju	Rallakunta	Nallabelli
24	Mujnea Yesu	Warangal	Warangal
25	Ganta Sridhar Reddy	Sarvapuram	Narsampeta
26	Bukya Balu	Chintalapalli	Parvathagiri
27	Gigiri Kanakaiah	Kazipet	Warangal

Cases of Hospitalisation from Narsampet Hospital in 2004 due to Pesticide Exposure

Sl.No.	Date Admission	Address	Spri	Posing	D.D.
1.	07-03-04	Cheera Narayana, S/o. Komuraiah, R/o.Dwarakapet"	"	08-03-04	
2.	25-07-04	Alai Gowardhan, S/o. Chendraiah, R/o. Narsampet	"	26-07-04	
3.	28.07.04	Azmeera Rajaiah, S/o. Lachaiah, R/o. Parshanayak Thanda,(m) Narsampet.	"		
4.	27-08.04	Azara Narsaiah, S/o. Hariya, R/o. Bhanojipet	"	Refer to M.G.M	
5.	30-08-04	Wardha Raju, S/o. Sailu, R/o. Ashok Nagar	"	31-5-04	
6.	03.09.04	Ponnel Rajaiah, S/o. Rajamallu, R/o.Kamalapuram,(M)Narsampet	"	05.09.04	
7.	08.09.04	Mohd. Akash, S/o. Alisab, R/o. Laknepally, (M) Narsampet	"		
8.	15-09-04	Kotagir Raju, s/o. jampaiah, R/o. Narayana thanda, (m) Narsampet."		18-09-04	
9.	15-09-04	Pindi Raju, S/o. Kattaiah, R/o. Laxmipuram, (m) Duggondi	"	18.09,.04	
10.	17-09-04	Sura Saraiah, s/o. Mallaiah, R/o. Manubothulagada (m) Khanapur"			
11.	17-09-04	Dharavath Erya, s/o. Devla, R/o. Thimmaraopet, (m)Chennaraopet	"		
12.	18-09-04	Eergura Balakumar, s/o. Mallaiah, R/o. Walab Nagar, (m) Narsampet			
13.	19.09.04	Tejavath Panthulu, s/o. Ramulu, Mondraigudem	"	20-9-04	
14.	19.9.04	Lingam pally Raju, s/o. Sambaiah, Narayana Thanda, Duggondi(m)	"	22-9-04	
15.	24.09.04	Mallu Baig Mallaiah, S/o. Komuraiah, Gundlapad	"	26.9.04	
16.	24.09.04	Malla boina Nagaiah, S/o. Kouraiah, Gundlapad, No.	"	26.9.04	
17.	25-9-04	Boda rama Singh, s/o. Narsimha, R/o. Seetharam thanda, (m) Narsampet.	"	26.09.04	
18.	26.09.04	Samaraboina Ramchander	"	Refer toM.G.M.	
19.	28.09.04	Kandikola Yakamma, W/o. Venkanna,R/o. Ashok nagar, Ghanpur,	"	29.9.04	
20.	28.09.04	Seelam Yelagoud, s/o. ?Seeramulu, R/o. Sarwapur, (M) Narsampet.	"	30-09-2004	
21.	28.09.04	Boda Narsaiah, S/o. Samulu, R/o.Bonda babi , (m), Narsampet.	"	29.09.04	
Sl.No.	Date Admission	Address	Spri	Posing	D.D.
22	29.09.04	Thadi Sattaya, s/o. Kandaya, R/o. Khanapur	"	29.09.04	
23.	29.09.04	M. Esob, s/o. samil, R/o. Akula Thanda, (m), Narsampet.	"	30.09.04	
24.	29.09.04	Badavath Ravi, s/o. Kherya, R/o. Kherya Thanda, (m) Khanapur	"	Refer M.G.M.	

25. 30.09.04 Gone Saraiah, s/o. Bhuttaiah, R/o. Darmaraopet, (m), Khanapur " Refer to M.G.M
26. 30.09.04 Nakkala Ilaiah, s/o. Venkataiah, " 31-5-04
27. 30.09.04 Malla Srinivas, s/o. Laxmaiah, R/o. Mangalaxmipet (m) Khanapur. " Refer to MGM
28. 30.09.04 Mohd. Ramzam s/o. Yakub, R/o. Chennaraopet " Refer to M.G.M>
29. 01.10.04 Veti Shankar, s/o. Komuraiah, R/o. Kamalapur (m), Narsampet " 01-10-04
30. 02.10.04 Bommineni Samireddy, s/o. Narsimha Reddy, r/o. Otai (m) Kothaguda. " 03-10-04
31. 07-10-04 Velpu Yakaiah, s/o. Sailu, R/o. manobothulagada (m) Khanapur" 09-10.04
32. 07.10.04 Medi Veeya, s/o. Devla, R/o. Khanapur " 09-10-04
33. 4.10.03 Bompelli Devender, s/o. Yakaiah, Laxmipura, KTDA " 10.10.04
34. 8.10.04 Manda Rambabu, s/o. Veeraiah, Sarwapuram,Narsampet, " 10.10.04
35. 8.10.04 Arabelli Kattaiah, S/o. Rajaiah, R/o. dwarakapet Narsampet " 9.10.04
36. 8.10.04 Boda Badru, s/o. Gogia, R/o. bandamidi thanda " 10.10.04
37. 9.10.04 Nare Kumar, s/o. Agaiah, R/o. Dwarakapet Narsampet, " 11.10.04
38. 9.10.04 Bhashaboina Kumaraswamy s/o. Sambaiah, R/o. Dwarakapet " 10.10.04
39. 9.10.04 Bukya Sevla, s/o. narsimha R/o. Khanugapuram. "
40. 10.10.04 Nagula Sambaiah, s/o. Rajaiah, R/o. narsampet "
41. 10.10.04 Badhavath narayana s/o. Sivya, R/o. Narsampet 11.10.04
42. 12.10.04 Pindi Janardhan, s/o. Rama swamy, R/o. Dwarakapet, narsampet " 15.10.04
43. 20.10.04 Kandikonda Narsimha swamy, s/o. Ramaiah, R/o. Nagurla Palli, Narsampet. " 21.10.04

Sl.No. Date Admission Address Spri Posing D.D.
44. 20.10.04 Gugilla Sitar, s/o. Chandraiah, R/o. pogullapalli, M/o. KTDA. " 23.10.04
45. 21.10.04 Bathini Uattaiah, s/o. Lingaiah, R/o. Lagampet, Khanapur. "
46. 21.10.04 Medi Srinu, S/o. Yakaiah, Ashoknagar, Khanapur " 24.10.04
47. 21.10.04 Satla Bhaskar, S/o. Sambaiah, R/o. Dwarakpet, Narsampet. "
48. 26.10.04 Neelapongu Kattaiah, s/o. Gopaiah, R/o. Khanapur. " 27.0.04
49. 27.10.04 Bontha Mallaiah, s/o. Mambothu lagadda, Khanapur 27.10.04

50. 27.10.04 Gadudula Ashok, s/o. Kattaiah, R/o. Dwarakapet. " 30.10.04
51. 28.10.04 Koravi Veeranna, s/o. Mallaiah, R/o. Khanapur " 30.10.04
52. 28.10.04 Dhanupati Ravinder, s/o. yadi Reddy, Peddamma gadda, Khaanapur " 30.10.04
53. 29.10.04 Damerla Sambaiah, s/o. y ellaiah, R/o. Mamidi veeraiahpally, Nallabelli. " 31.10.04
54. 29.10.04 Kasarla Ravi, s/o. Narsaiah, R/o. Sarwapuram. " 30.10.04
55. 30.10.04 Thanda Srinivas, s/o. Sammaiah, R/o. Sarwapuram. " 31.10.04
56. 30.10.04 Nedhuru Raja, s/o. Swamy, R/o. Narsingapur, Narsampet"
57. 31.10.04 Bommera Bhadraiah, s/o. Yakaiah, Khanapur. "
58. 31/10/04 Jarpula Pulamma, w/o. Lingaiah, R/o. Konapuram, KTDA. "
59. 2.11.04 Amulu Raja, s/o. Beerappa, R/o. Dasaripalli " 4.11.04
60. 4.11.04 Kulumalla Kommaiah, s/o. Kattaiah, R/o. Dwarakapet. " 6.11.04
61. 5.11.04 Polaboina Narsaiah, S/o. Bikshamaiah, Laxmipuram " 6.11.04
62. 6.11.04 Balaya Kothaguda, Veeranna, S/o. Manthya, R/o. Kammapalli, Narsampet, (M) " 7.11.04
63. 8.11.04 Akarapu Raja, s/o. Kattaiah, Madhannapeta " 9.11.04
64. 14.11.04 Lakhavath Dharma, s/o. swamy, Gundlapad, Nallabelli " 115.11.04
65. 14.11.04 Mamidi Bhadramma, w/o. Sailu, R/o. Chandraiah palli" 16.11.04
66. 17.11.04 Ajmira Jankya, s/o. Dhadha, Kampalli, Narsampet " 8.11.04
67. 17.1.04 Satla Sathaiah, S/o. Janardhan, R/o. Dwarakapet. " 18.11.04
68. 30.11.04 Ajmeera Maru, s/o. Dhadu, R/o. Kammagalli "

Pesticide Exposure Poisoning cases from Mahbubabad Hospital, Warangal district

Sl No	Name	Village	Age	Date of hospitalisation
1	E Sampath Mallaiah s/o Somaiah	Munigalaveedu	25	08/09/04
2	Chikati Mallesham s/o Ilaiah	Allaru	25	10/09/04
3	Boda Venkanna s/0 Lalya	Munigalaveedu	24	17/09/04
4	Guguloth Goria s/o Sriram	Appiralapalli	22	18/09/04
5	Kanchanapalli Yellaiah	NA	22	18/09/04
6	Voddi Venkanna s/o Buchaiah	Narsimhulagudem	25	24/09/04
7	Aryoth Ramesh s/o Bhadru	Vemnur	25	28/09/04
8	Sabavath Veeranna s/o Sukya	Senigaram	27	29/09/04
9	Kothuri Vijaya d/o Uppalaiah	NA	20	30/09/04
10	Azmera Nehru s/o Somlu	Laxmipuram	NA	
11	Pedole Veeranna s/o Pullaiah	Rajolu	25	03/10/04-died
12	Guguloth Chinna s/o Lachiya	Pedda tanda	25	06/10/04
13	Guguloth Ramu s/o Darinya	Pedda tanda	15	14/10/04
14	Tejavath Sardar s/o Bhaskar	Betholu	60	14/10/04
15	Pabboju Brahmachary s/o Vedachary	Kambalapalli	27	15/10/04
16	Daravath Sali w/o Achyar	Redyala	24	15/10/04
17	Badavath Pandu s/o Sakru	Korivi	20	16/10/04
18	Azmeera Ramaswamy s/o Thochya	Edullapusapalli	25	17/10/04
19	N Laxmaiah s/o Muthaiah	Gorimallu	23	20/10/04
20	Sangili Ramaiah s/o Bhadraiah	Nadikol	50	20/10/04
21	Janiki Yellaiah s/o Bixmaiah	Gunnoor	25	21/10/04
22	Vaddula Venkatreddy s/o Rangareddy	Kambalapalli	35	08/10/04-died
23	Bhukya Deepla s/o Narsing	Redyala	30	09/10/04
24	Kanchanapalli Nagaswamy s/o Biksham	Uggampalli	27	09/10/04
25	Maloth Sunder s/o Lachcha	Kandikonda	40	09/10/04
26	M Venkanna s/o Jalaiah	Kambalapalli	35	10/10/04
27	M Venkatramaiah s/o Narsaiah	Kambalapalli	35	10/10/04
28	Sompalli Ramaiah s/o Jaggaiah	Kistapuram	18	10/10/04
29	Guguloth Veeru s/o Varya	Kistapuram	25	11/10/04
30	Maloth Laxmaiah s/o Rajya	NA	35	12/10/04
31	Sangini Yadagiri s/o Uppalaiah	Ayyagaripalli	30	13/10/04
32	Maloth Hala s/o Hachya	Rajolu	NA	
33	Banoth Nageshwar Rao s/o Balu	Lingya tanda	20	13/10/04
34	Kanthi	Tekula tanda, Kuravi	NA	10/10/04
35	Thota Bhadraiah	Upparigudem	NA	10/10/04

Cases of Hospitalisation from Eturunagaram Hospital due to Pesticide Exposure

Sl No	Name	Age	Village
1	Enaganti Sathyam	22	Cross Road, Eturunagaram
2	Junagari Venkateshwarlu	30	Akulavari Ghanpur, Eturunagaram
3	Pedaboina Saraiah	30	Kondai, Eturunagaram
4	Alam Krishna Rao	28	Eturunagaram
5	Alam Rambabu	28	Gogupalli, Eturunagaram

Cases of Hospitalisation from Janagaon Hospital due to Pesticide Exposure

Sl No	Name	Age	Village
1	Konne Ramlal Jumiki	42	Konne, Bachannapet Mandal – died after one week
2	Mahasakthi Murali	32	Adavi Keshavapur, Jangaon Mandal – died after 4 days after admission on 9/8/04
3	Barla Saraiah	NA	Chinna Ramancharla
4	M Prakash	28	Tharigoppula, Narmetta mandal
5	Bhupathi Anandam	40	Marri Machyala, Cherial Mandal
6	V Komuraiah	34	Komuravelli, Cherial Mandal
7	T Venkateshwarlu	33	Garjekunta, Narmetta Mandal
8	K Chennaiah	42	Alimpur, Bachannapet Mandal