

**MINISTRY OF HEALTH  
HEALTH AND PREVENTION DEPARTMENT**

**PROJECT REPORT**

**CURRENT SITUATION OF PESTICIDE  
AND GRAMOXONE USE, CONTROL  
AND HEALTH EFFECTS**

**HANOI 12/2001**

- 1. PROJECT NAME:**  
CURRENT SITUATION OF PESTICIDE AND GRAMOXONE  
USE, CONTROL AND HEALTH EFFECTS
- 2. PROJECT MANAGEMENT UNIT:**  
MINISTRY OF HEALTH
- 3. ORGANIZED BY:**  
THE HEALTH AND PREVENTION DEPARTMENT – THE  
MINISTRY OF HEALTH
- 4. IN COLLABORATION WITH:**
  - The Institute of Labor Health & Environment
  - The Nha Trang Pasteur Institute
  - The local Preventive Medicine Center at 8 provinces: Dong Nai,  
Lam Dong, Tien Giang, Binh Duong, Binh Phuoc, NinhThuan,  
Binh Thuan, Khanh Hoa
- 5. SURVEY AREA:**
  - Major agricultural districts with heavy use of pesticides at 8  
provinces: Dong Nai, Lam Dong, Tien Giang, Binh Duong, Binh  
Phuoc, Ninh Thuan, Binh Thuan, Khanh Hoa
- 6. TIMING:** In the year 2001
- 7. FINANCE SPONSOR: SYNGENTA VIETNAM**

# PESTICIDE USE REPORT

## I. Background:

In recent years, as Vietnam tried to boost its industrialization process, chemical use has also been on the rise. Chemicals have been used widely in almost all industries, which has helped to increase crop yield, product quantity and quality for demanding consumers. The use of agricultural chemicals (pesticides) has long been considered an important method for increasing crop (*food, vegetable and fruit*) yield and productivity. Vietnam has made a dramatic change from a food-shortage sufferer to the world's 3<sup>rd</sup> largest rice exporter. There has been increased yield and exports from industrial plant products (coffee, rubber, sugarcane, cashew nut). Herbicide use has played a considerable role in these achievements.

Since 70% of Vietnam's population work in the farming and forestry industry, where pesticide use is most prevalent, there is a potential risk of their becoming exposed to pesticides.

Various types of pesticides have found their way into Vietnam in the past few years, sometimes illegally in large volumes. Farmers have not been given much guidelines or restrictions over pesticide use, resulting in an increasing number of pesticide poisoning cases from occupational use. Pesticide imports into Vietnam have increased over the years: 20,000 tons in the year 1991, 25,666 tons in 1995, 30,406 tons in 1997, 33,715 tons in 1999. Pesticide use also rises comparatively, from 0.3 kg/ai ha in 1985 and before, to 1kg/ai ha in 1997 (3 times), almost as high as the rate in neighboring countries.

Gramoxone has been used in the past 40 years in more than 100 countries for weed control and soil reclamation. 1 liter of Gramoxone contains 200gl ion Paraquat – ranked as moderately toxic by WHO. In Vietnam, Paraquat is on the restriction list. However, Paraquat has been increasingly imported and used in recent years, from 350,000 liters in 1997 to 411,600 liters in 2000.

According to statistics of the last 10 years, herbicide imports have grown rapidly from 834 tons in 1991 (accounting for 4.1% of all pesticide imports) to 5,000 tons in 1995 (19.4%). In 1998 alone, herbicide imports were 13,711 tons, accounting for 32.03% of total pesticide use (with insecticides 45.4% and fungicides 22.54%). Herbicides are mostly used in Central and Southern provinces, very little in the Northern mountainous area. Herbicides are used mainly for rice (89%) and very little for other crops (11%).

Along with the great benefits to the economy, pesticides also have their negative effects on human health, the community and the environment. The Plant Protection Department survey on pesticide purchase and use in 1996 shows more than 70% of the farmer respondents purchased pesticides in the black market, 94% used pesticides without instruction, only 19.3% were aware of pesticides harmful effects. This ignorance has caused pollution and harmful consequences to the health of pesticide users and the community as well.

According to the survey by the Institute of Labor Health & Environment, the ratio of chronic pesticide poisoning among farmers is 15 – 18% in areas where rice, tea, vegetable and fruits are the major crops. Immediate poisoning with such symptoms as headaches, vomiting, eyesight disorders, and skin allergies is found in 50% of the farmer respondents who spray or splash pesticide regularly.

The effect of Paraquat on human health has been the subject of study for many world scientists (Wester, RC et al; Howard; Swann in Malaysia; Gurunathan and coordinators in Sri Lanka; Sabapathy in the Philippines and Whitaker and coordinators in Thailand). Occupational contact with Paraquat is mainly through the skin, not through inhalation. Occupational contact with Paraquat can only cause some mild irritation to the eyes and the skin. The study concludes that most Paraquat-poisoning cases were from suicide.

In acute toxicity studies where paraquat aerosol sprays are directed into the nostrils of laboratory animals Paraquat can be accumulated in the lungs and cause serious damage. However the particles used in agriculture practices (400 to 800um) are well beyond the respirable range and therefore inhalation toxicity is not a toxicological endpoint of concern. (US EPA RED 1997)

There has been no adequate survey on pesticide use and impact on human health in Vietnam. This survey was conducted to get information on how pesticides, including Gramoxone, are used and controlled, and how it affects farmers' health, in order to suggest appropriate medical care measures to maintain a healthy and stable workforce for the country's industrialization and modernization programs.

## II. Objectives:

- To get information on the control and use of pesticides, mainly Gramoxone;
- To get information on the number and causes of pesticide poisoning cases (including Gramoxone) and the effects on pesticide users' health;
- To suggest safety measures for pesticide and Gramoxone use.

## III. Survey methodology:

### 1. Survey area:

- 8 Southern provinces growing agro-industrial crops (maize, coffee, vegetables, orchards, rice) with regular use of Gramoxone and other pesticides: Dong Nai, Lam Dong, Tien Giang, Binh Duong, Binh Phuoc, Ninh Thuan, Binh Thuan, Khanh Hoa.

One district from each province where Gramoxone and other pesticides are used frequently, two communes and randomly picked up 100 farming households in each commune. The interviewer interviewed one respondent in each household who regularly uses Gramoxone and other pesticide

No.	Province	Main crop	District	Commune	No. of respondents
1	Dong Nai	<i>Maize</i> , beans, tobacco	Thong Nhat	Thanh Binh, Cay Gao	214
2	Lam Dong	<i>Vegetable</i> , coffee, tea, ornamental trees, soil reclamation	Don Duong	Lac Xuan, Lac Lam	217
3	Binh Duong	Maize, <i>fruit trees</i> , soil reclamation	Ben Cat	An Dien, Phu An	203
4	Binh Phuoc	Maize, fruit trees, <i>land reclamation</i>	Loc Ninh	Loc Thuan, Loc Dien	201
5	Tien Giang	Rice bundle weeds	Cai Lay	Tan Binh, Long Khanh	241
6	Ninh Thuan	<i>Grape</i> , rice weeds	Phan Rang	Thanh Hai, Do Vinh	228
7	Binh Thuan	Fruit trees, <i>rice weeds</i>	Phan Thiet	Tien Loi, Phong Nam	203
8	Khanh Hoa	Soil reclamation, <i>sugarcane</i> , fruit trees	Dien Khanh	Dien Son, Dien Lac	160
	<b>Total</b>		<b>8</b>	<b>16</b>	<b>1,667</b>

## **2. Respondents:**

Gramoxone and other pesticide users.

## **3. Methodology:**

3.1 Research method: Crossing method

3.2 Details:

a) At the commune: Survey on working conditions and health care of local farmers.

b) For pesticide and Gramoxone users:

- Personal data (name, age, education)
- Pesticide use situation
- Working conditions
- Personal hygiene and safety equipment used
- Pesticide purchasing, transporting and storage
- Health condition of pesticide users
- Experience when using Gramoxone

c) For pesticide and Gramoxone poisoning cases:

- Personal data
- Cause of poisoning
- Poisoning symptoms
- Treatment

There are 3 types of questionnaires for 3 sample groups:

**Group 1:** Information on population, cultivation area, working population, agricultural structure, farming tools and equipment, pesticide suppliers, common diseases and accidents at each commune.

**Group 2:** Interviews with pesticide and Gramoxone users to get information on working conditions, use of pesticides and fertilizers at each household, signs and symptoms resulting from Gramoxone use, health conditions, common diseases and accidents.

**Group 3:** Survey on poisoning cases from pesticide and Gramoxone users at each commune.

Along with the questionnaires, interviewers were also equipped with the following:

- Photos of popular sprayers
- Statistics of main crop diseases
- List of trading names and popular names of pesticides
- Photos of Gramoxone bottles (1-liter and 100ml).

### **3.3 Collection of information:**

- *Interviewers:* 2 staff from the provincial Preventive Medicine Center, 1 staff from the district Medical Center and some staff from each commune.
- *Supervisors:* Representative from the Preventive Medicine Department, the Institute of Labor Health & Environment, the Nha Trang Pasteur Institute and Syngenta Vietnam.

Survey at each household:

***Sample 1:*** Worked with the local People's Committee and the Medical Center to get general information from each commune.

***Sample 2:*** Grouping of households in survey. Each group included 5 households/time. The respondent was the regular user of pesticides and Gramoxone from each household.

***Sample 3:*** In sample 2, if there was any case of pesticide or Gramoxone poisoning, the interviewers then interviewed these respondents. If these respondents did not belong to the households in the survey, the interview was conducted later.

### **3.4 Timing:**

The survey was conducted in 8 provinces from July to August 2001.

### **3.5 Data processing:**

The data is processed by medical statistics method using EPI INFO and EXCEL softwares.

## **IV. Survey results:**

## I. GENERAL INFORMATION

### 1.1. Commune characteristics:

#### 1.1.1 Demographics:

Table 1: Demographics and the percentage of pesticide-use households

No.	Province	District	Commune	Population	Labour force	Number of households	Pesticide use households	Percentage of pesticide use (%)
1	Khanh Hoa	Dien Khanh	Dien Son	8,672	5,714	1,683	1,122	66.67
			Dien Lac	7,683	2,572	1,543	1,350	87.49
2	Ninh Thuan	Phan Rang	Thanh Hai	11,378	5,764	2,370	1,540	64.97
			Do Vinh	7,173	2,036	8,721	932	10.68
3	Lam Dong	Don Duong	Lac Lam	8,096	3,758	1,322	1,227	92.81
			Lac Xuan	9,920	6,531	1,870	1,500	80.21
4	Binh Thuan	Phan Thiet	Tien Loi	5,722	2,761	1,191	984	82.61
			Phong Nam	15,822	5,220	3,225	2,750	82.57
5	Binh Phuoc	Loc Ninh	Loc Thuan	7,885	4,284	1,667	1,667	100.00
			Loc Dien	8,338	2,868	1,801	1,510	83.84
6	Binh Duong	Ben Cat	An Dien	6,275	2,576	1,552	876	56.44
			Phu An	5,936	3,256	1,399	770	50.39
7	Dong Nai	Thong Nhat	Thanh Binh	12,756	6,326	2,154	1,978	91.82
			Cay Gao	9,083	4,858	1,626	1,503	92.43
8	Tien Giang	Cai Lay	Tan Binh	10,939	5,317	2,342	2,100	89.66
			Long Khanh	12,570	5,490	2,741	2,374	86.61
	<b>Total</b>			<b>143,111</b>	<b>69,331</b>	<b>37,207</b>	<b>24,183</b>	<b>64.99</b>

*Comments:* The average population of one commune is 8,944. The least populated commune is Do Vinh of Phan Rang district, Ninh Thuan province, with only 2,036 inhabitants.

- The total population of all the 16 surveyed communes is 143,111, of which people aged between 15 and 60 account for 48.44% (69,331 people).
- Over 80% of the farming households in 11 communes use pesticides, in some cases 90 – 100% (in Lac Lam, Thanh Binh, Cay Gao, Loc Thuan communes).

#### 1.1.2 Cultivation area (ha):

Table 2: Crop allocation

No.	Province	District	Commune	Total cultivation area	Rice area	Crop area	Industrial crop area
1	Khanh Hoa	Dien Khanh	Dien Son	847.77	646.75	131.21	69.81
			Dien Lac	324.00	119.71	16.00	108.30
2	Ninh Thuan	Phan Rang	Thanh Hai	324.16	292.78	31.38	0.00
			Do Vinh	464.22	322.04	111.11	22.02
3	Lam Dong	Don Duong	Lac Lam	463.32	62.27	400.18	0.87
			Lac Xuan	1,216.00	300.00	785.00	131.00
4	Binh Thuan	Phan	Tien Loi	384.12	151.24	182.88	50.00

		Thiet	Phong Nam	900.00	450.00	3.00	250.00
5	Binh Phuoc	Loc Ninh	Loc Thuan	1,181.00	10.00	10.00	841.00
			Loc Dien	2,658.00	100.00	6.00	2,518.00
6	Binh Duong	Ben Cat	An Dien	2,758.86	634.70	421.25	1,702.91
			Phu An	1,525.06	450.00	89.00	93.50
7	Dong Nai	Thong Nhat	Thanh Binh	2,129.87	76.10	869.26	1,160.61
			Cay Gao	1,568.78	211.26	56.76	902.60
8	Tien Giang	Cai Lay	Tan Binh	361.00	355.00	6.00	-
			Long Khanh	1,882.00	1,368.00	25.00	489.00
<b>Total</b>				<b>18,988.16</b>	<b>5,571.85</b>	<b>3,360.03</b>	<b>8,339.62</b>

Comments:

- The total cultivation area of all the 16 surveyed communes is 18,988.16 ha, of which rice cultivation area accounts for 29.31% , crop – 17.67%, industrial crop – 43.87%
- The average cultivation area for each commune is 1,187.88 ha, of which the average area for rice is 348.24 ha, crop – 210.00 ha, industrial crop – 521.26 ha.

1.1.3 Main crops:

There are various crops in the communes: rice, maize, sweet-potato, cassava, etc. Fruit trees include rambutan, longan, mango, durian etc. There are also some kinds of vegetables like balsam-apple, cucumber, bean, mustard greens, spinach etc. but with small cultivation area. Industrial crops include rubber, sugarcane, pepper, cashew, coffee etc. The total cultivation area for industrial crops in all 16 communes is 8,339.62 ha, averaging 521 ha per commune, accounting for 43.87%.

1.1.4 Plant protection methods:

Table 3: Percentage of households using plant protection methods

No.	Methods	Killing insects	Killing fungus	Killing weeds
1	Manual	13.8	8.4	69.3
2	Trapping	0.2	0.1	0
3	Pesticide	98.8	97.0	96.8
4	Natural enemies	0.5	0.2	0

Comments: Most of the households in the survey use pesticides to kill insects (98.8%), fungus (97%) and weeds (96.8%) to protect their crops. Only 13.8% of the households use manual methods to kill insects, 8.4% to kill fungus, and 69.3% to kill weeds. Other methods like trapping or using natural enemies are rarely used (only 0.1 – 0.3%).

1.1.5 Public awareness programs in the year 2000:

Table 4: Percentage and content of community-based public awareness programs

No.	Content	Total communication times	Average communication times	Percentage (%)
1	Birth control	333	21	37.54



2	Hygienic issues	184	12	20.74
3	Preventive medicine	291	18	32.80
4	Pesticide safety use	79	5	8.90
	<b>Total</b>	<b>887</b>	<b>56</b>	<b>100</b>

*Comments:* These community-based public awareness programs were made known to local people via PA system, local radio stations, posters, seminars etc. The local Cultural Information Board, Birth Control Agency, People's Committee, and Farmers' Association are responsible for communicating these programs.

Although about 70% of the households use pesticides (more than 100 brands), there have been very few public awareness programs on pesticide safety use, accounting for only 8.9% of the total communication times in each commune, averaging 3 times per commune.

1.2. Respondents' profile:

1.2.1 Respondents' age and gender: (n = 1,667)

Table 5: Respondents' age and gender

No.	<u>Age</u>	Number	Percentage (%)
1	15 – 29	173	10.37
2	30 – 39	437	26.2
3	40 – 49	509	30.5
4	50 – 59	453	27.2
5	Over 60	95	5.69
	<u>Gender</u>		
1	Male	1,602	90.1
2	Female	165	10.0

The average age of the respondents is 44.6, most of them are male (90.1%), only 10% are female.

1.2.2 Education level:

Table 6: Respondents' education level

No.	Education level	Number	Percentage (%)
1	Primary school	518	31.1
2	Secondary school	809	48.6
3	High school	304	18.3
4	Intermediate education	5	0.3
5	University graduate	10	0.6
6	Illiterate	20	1.0

Most of the respondents have primary school education (31.1%) and secondary school education (48.6%). Only 18.3% of the respondents have high school education. The illiteracy rate is 1%.

### 1.2.3 Number of persons in the households:

Table 7: Number of persons in the households

No.	Number of persons in each household	Number of households	Percentage (%)
1	1 – 2	38	2.3
2	3 – 4	505	<b>30.4</b>
3	5 – 6	666	<b>40.1</b>
4	7 – 8	325	19.6
5	9 – 10	101	6.1
6	More than 10	30	1.9

40.1% of the households have 5 – 6 members, 30.4% have 3 – 4 members, and 19.6% have 7 – 8 members.

### 1.2.4 Cultivation area for each household:

Table 8: Crop allocation

No.	Crop	Area (ha)	Regular land use households (%)	Future land use households (%)
1	Rice	25,081	99.5	86.1
2	Crops (maize, sugarcane, cassava, etc.)	8,555	77.7	72.7
3	Vegetables	10,798	76.7	85.9
4	Fruit trees	11,364	98.7	72.0
5	Coffee	14,239	92.8	64.4
6	Pepper	16,615	98.7	87.3
7	Rubber	1,520	99.3	83.8
8	Others	698	100	4.4
	<b><i>Total land area</i></b>	<b><i>90,626</i></b>		
	<b><i>Cultivation area</i></b>	<b><i>84,681</i></b>	<b><i>93.4</i></b>	

Most of the households use their land to grow rice, rubber, pepper and fruit trees (92.8 – 99.5%). About 76.7 – 77.7% of the households grow crops and vegetables. Regular cultivation land accounts for 93.4% of the allocated land area. Land for coffee cultivation is likely to decline sharply in the next few years, while vegetable cultivation area will rise 10%.

## II. PESTICIDE USE AND CONTROL

### 2.1 PESTICIDE CONTROL

#### 2.1.1 Pesticide shops:

Most of the respondents purchase pesticide from private shops (97.35%). Only 2.63% of them buy pesticide from state-owned stores.

#### 2.1.2 Pesticide packaging:

Table 9: Pesticide packaging

No.	Transport pesticide	Number of respondents	Percentage
1	With damaged packaging	128	7.66
	- Always	114	6.83
	- Sometimes	14	0.83
2	Always with good packaging	1,539	92.32
	<b>Buy pesticide</b>		
1	Always with labels	1,580	94.78
2	Without labels	87	5.3
	- Always	5	0.29
	- Sometimes	82	4.91

#### Comments:

- Most of the respondents transport pesticides with good packaging (92.32%) and only 7.66% with damaged packaging.
- 94.78% of the respondents only buy pesticides with labels while 5.3% don't.

### 2.1.3 Label instruction awareness:

Table 10: Label instruction awareness

No.	Reading label instruction	Number of respondents	Percentage
1	Yes	1,580	94.78
	- Fully understand	1,471	88.24
	- Not fully understand	109	6.53
2	Don't care	87	5.21
	<b>Being aware of toxicology color band</b>		
1	Yes	1,023	61.36
	- Fully understand	891	53.44
	- Not fully understand	132	7.93
2	Don't care	644	38.63
	Following label instructions		
1	Always	1,331	79.84
2	Sometimes	270	16.19
3	Don't care	66	3.95

Comments:

- As many as 94.78% of the respondents often read the label instructions, of which 88.24% fully understand the label information. Only 5.21% don't care for label information.
- Respondents who can understand the label color band account for 53.44% – 61.36%. More than one third (38.63%) don't care for the color band on the label.
- 79.8% of the respondents always follow the label instructions, 16.19% sometimes follow the instructions and 3.95% never care.

### 2.1.4 Pesticide storage:

Table 11: Pesticide storage

No.	Storage place	Number of respondents	Percentage
1	In the bedroom	13	0.77
2	In the kitchen	134	8.03
3	In the food cupboard	5	0.29
4	In the garden	719	<b>43.13</b>
5	In a tight case	443	<b>26.57</b>
6	Others (terraces, animal's cages etc.)	353	<b>21.17</b>

Comments: The respondents mostly keep pesticides in the garden (43.13%), in tight cases (26.57%) and in other places like terraces, animal's cages etc. (21.17). However pesticides are still stored in the kitchen (8.03%), in the food cupboard (0.29%) and in the bedroom (0.77%).

### 2.1.5 Disposal of empty pesticide packages:

Table 12: Disposal of empty pesticide packages

No.	Disposal method	Number of respondents	Percentage
1	Throw away	834	50.02
2	Clean up and use for other purposes	12	0.71
3	Sell	159	9.53
4	Burn or destroy	341	20.45
5	Bury	565	33.89

*Comments:* Half of the respondents (50.02%) throw away empty pesticide packages after use, 33.89% bury, 20.45% burn or destroy, 9.53% sell to junk collectors and 0.71% clean the packages and use for other purposes.

## 2.2 PESTICIDE USE

### 2.2.1 Pesticide currently used at the communes:

Table 13: Pesticide used at the 16 communes

No.	Category	Number of brands	Percentage
1	Insecticide	59	52.67
2	Fungicide	31	27.67
3	Herbicide	22	19.64
	<b>Total</b>	<b>112</b>	<b>100</b>

*Comments:* There are 59 brands of insecticides, 31 brands of fungicides and 22 brands of herbicides currently in use at the 16 communes. Although Monitor and Wofatox have been banned in Vietnam since 1995, they are still being used in some communes.

There are not enough antidotes at the local emergency clinics, which poses a high risk of death for pesticide poisoning cases. Please refer to Appendix 1 for a list of currently used pesticides at the communes in survey.

## 2.2.2 Form and method of pesticide use

Table 14: Method of using pesticide

No.	Pesticide			Gramoxone		
	Using method	Number of respondents	Percentage	Using method	Number of respondents	Percentage
1	Mix with soil then sprinkle	221	13.25	Mix with water then sprinkle	15	1.35
2	Mix with water then sprinkle	187	11.21	Mix with water then spray	1,050	94.59
3	Mix with water then spray	1,627	97.60	Mix with other pesticide then sprinkle	21	1.89
4	Seed treatment	63	3.77	Mix with other pesticide then spray	49	4.41

*Comments:* Most of the respondents spray pesticides themselves, they only hire seasonal workers to spray highly poisonous pesticides. Some farming households in 4 of the 16 communes sometimes coordinate with the local Plant Protection Department for spraying pesticides.

The most popular method of using pesticides is to mix pesticides with water then spray (used by 97.6% of the respondents). 13.25% of the respondents mix pesticides with soil then sprinkle, and 11.21% mix with water then spray. Only 3.77% of the respondents use pesticide for seed treatment.

Gramoxone is mostly mixed with water then sprayed (used by 94.59% of the respondents) or mixed with other pesticides then sprayed (4.41%).

## 2.2.3 Herbicide use

### 2.2.3.1 Popular weed-control methods and their effectiveness:

Table 15: Popular weed-control methods and their effectiveness

No.	Weed control methods	Used by		Effectiveness	
		Number of respondents	Percentage	Number of respondents	Percentage
1	Burn fields after harvest	253	15.17	92	5.51
2	Plough, rake the fields	653	39.17	162	9.71
3	Uproot weeds by hands	1,319	79.12	231	13.85
4	Use herbicides	1,289	77.32	1,181	70.84

*Comments:*

- Manual methods and herbicides are the two most popular methods for weed control (used by 77.32% - 79.12% of the respondents). Other methods like ploughing or burning the fields are less common, used by only 39.17% and 15.17% of the respondents respectively. The rest of the respondents (1.49%) use other methods.
- As many as 70.84% of the respondents say using herbicides is the most effective method, 13.85% prefer manual methods, and the rest kill weeds by ploughing (9.71%) or burning the fields after harvest (5.51%).

### 2.2.3.2 Reasons for using Gramoxone

**Table 16 Reasons for using Gramoxone \*\*\*\*\***

No.	Reasons	Number of agreed respondents	Percentage
1	Easy to use	528	61.75
2	Highly effective	747	87.9
3	Harmless to human health	198	23.15
4	Cheap	260	30.40
5	Non-toxic	140	16.37
6	Harmless to soil and the environment	132	15.43
7	Others	47	5.49

***Comments:*** 87.9% of the respondents find Gramoxone highly effective against weeds, 61.75% think this herbicide easy to use, 30.4% use Gramoxone because it's cheap. 16.37% agree that Gramoxone is non-toxic, 23.15% say it's harmless to human health and 15.43% say it's harmless to soil and the environment.

### 2.2.3.3 Purpose of using Gramoxone

Table 17: Number of farming households using Gramoxone for weed control

No.	Crops	Number of farming households	Percentage
1	Rice bund weeds	365	42.69
2	Crops	107	12.51
3	Vegetables	193	25.57
4	Fruits	264	30.87
5	Coffee	146	17.07
6	Rubber	122	14.26
7	Sugarcane	17	1.98

***Comments:***

- More than half of the households use Gramoxone for weed control of long-term crops (52.51%), for land preparation (51.11%), and for rice weed control (32.39%).
- Gramoxone is mainly used to kill rice weeds (42.69%), weeds at orchards (30.87%), vegetable gardens (25.57%), coffee and rubber plantations (17.07% and 14.26% respectively). Very few households use Gramoxone for sugarcane weed control (1.98%).

### 2.2.4 Pesticide use duration

#### 2.2.4.1 Duration of pesticide use

Table 18: Duration of using pesticide and Gramoxone



No.	Pesticide			Gramoxone		
	Duration	Number of respondents	Percentage	Duration	Number of respondents	Percentage
1	Over 10 years	1,089	65.3	1 – 2 years	422	38.01
2	6 – 9 years	324	19.43	3 – 4 years	455	40.9
3	2 – 5 years	242	14.5	5 – 6 years	172	15.49
4	Under 2 years	12	0.7	7 – 8 years	48	4.32
5				9 – 10 years	6	0.54
6				Over 10 years	7	0.63
	<b>Total</b>	<b>1,667</b>	<b>100</b>		<b>1,110</b>	<b>100</b>

*Comments:* 1,089 respondents (65.3%) have used pesticide for more than 10 years, 19.4% have used for about 6 to 9 years, and 14.5% for 2 to 5 years. Only 0.7% of them have used pesticides for less than 2 years.

#### 2.2.4.2 Annual pesticide spraying frequency

Table 19: Pesticide spraying frequency

No.	Annual frequency	Number of respondents	Percentage
1	Less than 5 times	359	21.53
2	6 – 10 times	351	21.05
3	11 – 15 times	278	16.67
4	16 – 20 times	165	9.89
5	More than 20 times	514	30.83

*Comments:* 514 respondents (30.3%) spray pesticides more than 20 times per year, 9.89% spray between 16 and 20 times per year, 16.7% spray for 11 – 15 times and 21% use pesticides less than 10 times per year. On average, a respondent spray pesticides around 15 times per year.

#### 2.2.4.3 Gramoxone spraying period

Table 20: Gramoxone spraying period

No.	Month	Number of respondents	Percentage
1	January	48	4.32
2	February	78	7.02
3	March	178	16.03
4	<b>April</b>	<b>239</b>	<b>21.53</b>
5	<b>May</b>	<b>340</b>	<b>30.60</b>
6	<b>June</b>	<b>414</b>	<b>37.29</b>
7	<b>July</b>	<b>401</b>	<b>36.12</b>
8	August	216	19.45
9	September	227	20.45
10	October	146	13.15
11	November	81	7.29
12	December	71	6.39

***Comments:*** Gramoxone is used throughout the year, but the peak time is in the rainy season (from May to July), when it is used by 30 – 37% of the respondents.

### 2.2.5 Pesticide-spraying manpower structure

Table 21: Pesticide-spraying manpower structure

No.	Spraying manpower	Pesticide		Gramoxone	
		Number of respondents	Percentage	Number of respondents	Percentage
<b>By gender</b>					
1	Male	1,452	87.10	1,015	91.44
2	Female	215	12.89	85	7.65
<b>By relationship with respondents</b>					
3	Grandfather	18	1.08	14	1.26
4	Grandmother	12	0.72	1	0.08
5	Children	182	10.91	109	9.81
6	Others (hired)	71	4.2	28	2.52
	<b>Total</b>	<b>1,667</b>		<b>1,110</b>	

***Comments:***

- Most of the direct users are male (87.10%), only 12.89% female. Some members of the respondent's family also help with spraying pesticides, with children account for 10.91% of the spraying manpower, and grandparents 1.8%. Hired labour only account for 4.2% of the manpower.
- Up to 66.58% of the respondents use Gramoxone. Males account for 91.44% of the direct users, females 7.56%. Gramoxone direct users also include children of the respondents (9.81%). Only 2.5% of the households hire labour for spraying.

### 2.2.6 Pesticide sprayers

#### 2.2.6.1 Popular sprayers

Table 22: Types and origins of popular sprayers

No.	Type and origin of sprayers	Number of users	Percentage
1	8-ltr, made in Vietnam	355	21.29
2	10-ltr, made in China	3	0.17
3	12-ltr, inox double-sprayer	1	0.05
4	5-ltr	5	0.29
5	8-ltr, made in Vietnam	54	3.23
6	10-ltr, inox double sprayer	459	27.53
7	X-pert sprayer	110	6.59
8	12-ltr, plastic double-sprayer	680	40.79
	<b>Total</b>	<b>1,667</b>	<b>100</b>

***Comments:*** Among the 8 sprayer samples used by farmers, the most popular types are 8-ltr plastic single sprayer (made in Vietnam), 12-ltr plastic double sprayer and 10-ltr stainless double sprayer,

used by 21 – 40% of the respondents. Other types are less common, used by only 6%. Most of the respondents (98%) purchase their own sprayers.

### 2.2.6.2 Conditions of sprayer

Table 23: Conditions of sprayer

No.	Condition	Number of sprayers	Percentage
1	Good	103	6.17
2	Clogged	1,564	93.82
	- Regularly	67	4.3
	- Sometimes	1,497	95.7
3	Leaked	940	56.38
	- Regular	25	2.7
	- Sometimes	915	97.3

*Comments:* Most of the sprayers are sometimes clogged and/or leaked, accounting for 93.8% - 56.38%

### 2.2.6.3 Treatment of damaged sprayers

Table 24: Treatment of damaged sprayers

No.	Treatment	For damaged hose		For leaked sprayer	
		Number	%	Number	%
1	Blow the hose	147	8.81		
2	Poke through the hose	1,263	75.76		
3	Suck by mouth	32	1.91		
4	Wash with water	803	48.17		
5	Do temporary repair and continue to use			774	46.43
6	Continue to use without repair			40	2.39
7	Replace the damaged part	239	14.33	1,035	62.08
8	Buy a new sprayer			150	8.99

*Comments:*

- When the hose is damaged, 75.7% of the respondents clear the clog by poking something through the hose, 48.2% wash it with water, 14.3% replace the damaged part, 8.8% blow through it and 1.9% still suck the hose to clear the clog.
- When the sprayer or the hose is leaking, 46.43% of the respondents will fix it temporarily and continue to use, 62.08% replace the damaged part and 8.99% buy a new sprayer. Some respondents still do not care about damaged or leaky sprayers and risk pesticide poisoning through direct contact.

### 2.2.7 Contact points with pesticide while spraying

Table 25: Contact points with pesticide while spraying

No.	Contact point	Regularly		Sometimes	
		Number	%	Number	%

1	Eyes	43	2.57	353	21.17
2	Head	35	2.10	262	15.71
3	Face	89	5.33	625	37.49
4	Arms and legs	635	38.09	762	45.71
5	Back	162	9.71	637	38.21
6	Chest, abdomen	58	3.47	169	10.13
7	Others	9	0.53	69	4.13

*Comments:* Respondents who spray pesticide regularly are more exposed to pesticide contact, mostly through the arms and legs (38.09%), back (9.7%), face (5.33%). The head, eyes, chest and abdomen are less exposed to pesticide contact.

## 2.2.8 Pesticide awareness

### 2.2.8.1 Awareness of pesticide toxicology and spraying habits

Table 26: Awareness of pesticide toxicology and spraying habits

No.	Awareness		%
1	Pesticide is toxic, should be warned of	1,599	95.92
2	Pesticide is non-toxic	54	3.23
3	Don't care, don't know	14	0.83
	<b>Habits when spraying</b>		
1	Eating	11	0.65
2	Drinking	63	3.77
3	Smoking	57	3.41

*Comments:*

- 95% of the respondents know that pesticides are toxic. However, 3.23% of them still assume that pesticides are non-toxic and 0.83% do not care.
- There are still some respondents who eat, drink and smoke while spraying (0.65 – 3.77%).

### 2.2.8.2 Respondents' self-assessment of Gramoxone toxicology and symptoms of poisoning

Table 27: Self-assessment of Gramoxone's health effects

No.	Toxicology level	Number	%
1	High	436	39.27
2	Moderate	315	28.37
3	Low	105	9.45
4	Non-toxic	163	14.68
5	Don't know	91	8.19
	<b>Symptoms of poisoning</b>		
1	Have experienced	87	7.83
2	Have no symptoms	936	84.32
3	Don't remember	87	7.83

*Comments:*

- 39.27% of the respondents see Gramoxone as highly toxic, 28.37% find it moderately toxic and 9.45% of them think Gramoxone is not very toxic. 23.87% assume that Gramoxone is not toxic or don't know.
- Most Gramoxone users cannot spot symptoms of poisoning (84.32%). About 7.83% have experienced these symptoms.

#### 2.2.8.3 Cleaning after using pesticide

Table 28: Hygienic measures after spraying pesticide

No.	Hygienic measures	Sometimes		Regularly	
		Number	%	Number	%
1	Bath without soap	102	6.1	120	7.19
2	Bath with soap	45	2.69	1,472	88.30
3	Scrub the hands with sand or soil	11	0.65	13	0.79
4	Dry the hands	11	0.65	25	1.49
5	Wash the hands with soap	14	2.63	853	51.16

*Comments:* The most popular hygienic measures after spraying pesticide are to bath with soap (88.3%) and wash the hands with soap (51.16%). Only 7.19% of the respondents bathe without soap and 0.79% scrub their hands with sand or soil.

#### 2.2.8.4 Treatment of Gramoxone poisoning

Table 29: Awareness of Gramoxone poisoning treatment and effects

No.	Poisoning treatment	Number of respondents	Percentage
1	Know how to treat poisoning	267	24.86
2	Know a little	287	25.85
3	Don't know	546	49.18
	<b>Health effects</b>		
1	Bad effects on health	438	39.45
2	Minor effects	440	39.63
3	No effects	179	16.12
4	Don't know	43	3.87

*Comments:*

- Half of the respondents do not know how to treat a Gramoxone poisoning case, only 24.86% can do and 25.85% know just a little.
- More than one third of the respondents (39.45 – 39.63%) think Gramoxone have bad or minor health effects, only 16.12% say it does no harm and 3.87% do not know.

### 2.2.9 Common safety gear when using pesticide and Gramoxone

Table 30: Safety gear for spraying

No.	Safety gear	Pesticide		Gramoxone	
		Number	%	Number	%
1	Masks	1,064	<b>63.82</b>	313	28.19
2	Long-sleeved shirts, pants	1,557	<b>93.40</b>	1,044	<b>94.05</b>
3	Gloves	279	16.73	168	15.13
4	Eyeglasses	431	25.85	265	23.87
5	Hats	1,435	<b>86.08</b>	981	<b>88.37</b>
6	Raincoats	225	13.49	453	40.81
7	Aprons	14	0.83	7	0.63
8	Shoes, boots	503	30.17	122	10.99
9	Nothing	17	1.01	7	0.63

**Comments:**

- In general, the respondents do not use safety gear when spraying pesticides and Gramoxone. However, they do wear long-sleeved clothing (90%) and masks (63.8% for pesticide users and 28.19% for Gramoxone users).
- In general, more respondents wear masks and boots when spraying pesticides other than Gramoxone and more respondents wear raincoats when spraying Gramoxone.
- The main reasons for not wearing safety gear are “uncomfortable” (26.03%), “unnecessary” (8.03%), and “not available” (7.6%). Only 1.37% don’t know they should wear safety gear and 0.95% think safety gear are costly.

### 2.2.10 Source of information on pesticide safety use

Table 31: Source of information on pesticide safety use

No.	Source of information	Number of respondents	%	Priority
1	Labels, leaflets, brochures	768	46.07	1
2	Ads on radio, TV, newspaper	288	17.27	2
3	Shops/Agents	267	16.02	3
4	Neighbours	245	14.69	4
5	Seminars, IPM, Plant Protection Dept., etc.	159	9.53	5
6	Conferences, product launches	40	2.39	6

**Comments:**

- Farmers get information about pesticide safety use mostly from leaflets and brochures (46.07%), less than 20% of the respondents obtain info from other sources.
- Up to 73.48% of the respondents have never had a chance to attend pesticide safety use seminars, only 26.52% have attended once or more.

## III. PESTICIDE POISONING CASES AND HEALTH EFFECTS

### 3.1 Current diseases at the 16 communes

Table 32: Current diseases at the 16 communes (total population of 143,111)

No.	Disease	Number of cases	Percentage
1	Cardio-vascular disease	607	0.42
2	Respiratory diseases	3,523	2.46
3	Digestive disorders/diseases	3,306	2.34
4	Urinary diseases	1,160	0.81
5	Neural diseases	312	0.21
6	Ear – Nose – Throat diseases	3,171	2.21
7	Dental diseases	2,047	1.43
8	Skin irritations	2,438	1.71
9	Gynecology	5,061	7.07
10	Muscular/joint diseases	1,885	0.88
11	Tumors	289	0.22
12	Surgery	1,360	1.01
13	Others	4,013	2.99

**Comments:**

- The percentage of cardio-vascular cases (mostly high blood pressure) is the highest (1.26%) at Loc Thuan commune (Loc Ninh, Binh Phuoc province) and the lowest (0.01%) at Tien Loi and Thanh Hai communes. The average rate of cardio-vascular cases is 0.42% of the total population at the 16 communes.
- The percentage of respiratory cases is the highest (13.02%) at Phu An commune (Binh Duong province) and the lowest (0.27%) at Tien Loi commune. The average rate of respiratory cases is 2.46%. Respiratory disease is the 2<sup>nd</sup> most common disease at the communes in the survey.
- Among the digestive disorder cases, An Dien commune has the highest rate at 11.39% and Tien Loi communes has the lowest rate at 0.36%.
- With the remaining diseases, gynecology cases remain high (7.07%), followed by dental diseases (2.21%).
- Women are more likely to acquired diseases than men, with 80.95% for respiratory diseases and 70.02% for urinary diseases. For other diseases, women and men face the same rate of acquiring diseases.

3.2 Rate of accidents and deaths

Table 33: Causes of accidents and poisoning cases from Health Care centers of study Communes

(Working population: 74,468)

No.	Cause	Number of accidents	%	Rate of accidents/ Working popula-tion	Number of deaths	Rate of death/ Acci-dent
1	At work	647	33.03	0.86	3	0.46
	- Male	505		78.05	2	
	- Female	142		21.94	1	
2	Other causes of accidents	1,149	58.65	1.54	19	1.65

	- Male	719		62.57	14	
	- Female	430		37.42	5	
3	Pesticide poisoning	<b>89</b>	4.54	<b>0.12</b>	<b>6</b>	<b>6.74</b>
	- Male	78		87.64	2	
	- Female	11		12.35	4	
4	Herbicide poisoning	<b>10</b>	0.51	<b>0.01</b>	<b>0</b>	<b>0</b>
	- Male	9		90.00	0	
	- Female	1		10.00	0	
5	Other causes of poisoning	<b>74</b>	3.78	<b>0.09</b>	<b>1</b>	<b>1.35</b>
	- Male	48		64.86	0	
	- Female	26		35.14	1	
	<b>Total cases</b>	<b>1,959</b>		<b>2.63</b>	<b>27</b>	<b>1.37</b>

**Comments:** There have been 1,959 cases of accidents and poisonings (from January 2000 until August 2001) at the 16 communes, in which work accidents at work account for 33% for example machinery and equipment accidents from other causes (mostly traffic) 58.65%, pesticide poisoning 4.54%. These accidents and poisoning cases have caused 27 deaths (1.37%).

- Accidents at work account for 0.86% of the total accidents, accidents from pesticide poisoning 0.12% from other causes 1.54% (resulting in 19 deaths).
- The highest rate of death per incident is among the pesticide poisoning cases, which account for 6.74% of the 89 cases. Most of the accident cases are found in men, ranging from 62% to 90%. With herbicides no deaths were recorded



### 3.3 Pesticide poisoning

3.3.1 Pesticide poisoning cases.(from minor accidents to fatalities) recorded during interviewing process for the period Jan 2000 to August 2001

Table 34: Pesticide poisoning cases

No.	Commune	Province	Commune's Population	Poisoning cases	Percentage	Poisoning rate per 10,000 people
1	Cong Thanh	Ninh Thuan		4	2.01	-
2	Tan Son			3	1.50	-
3	Nhon Hoi			4	2.01	-
4	Do Vinh		2,036	1	0.50	4.91
5	Dien Lac	Khanh Hoa	7,683	4	2.01	5.20
6	Dien Son		8,672	21	10.55	24.21
7	Long Khanh	Tien Giang	12,570	32	16.08	25.45
8	Tan Binh		10,939	40	20.10	36.56
9	Lac Xuan	Lam Dong	9,920	8	4.02	8.06
10	Lac Lam		8,096	2	1.00	2.47
11	Loc Dien	Binh Phuoc	8,338	21	10.55	25.18
12	Loc Thuan		7,885	20	10.05	25.36
13	Xuan Hoa	Binh Thuan		21	10.55	-
14	Tien Loi		5,722	18	9.04	31.45
	<b>Total</b>			<b>199</b>	<b>100.00</b>	<b>22.97</b>

**Comments:** There have been 199 pesticide poisoning cases at the 14 communes since 2000. This compares with the commune health center reported incidents of 89 cases.

Tan Binh commune has the highest rate of pesticide poisoning (20.10%) with 40 cases, followed by Long Khanh commune with 32 cases (16.08%), Loc Dien, Loc Thuan, Dien Son with around 20 – 21 cases each (10%). On average, each commune has 14 poisoning cases.

For every 10,000 people, the poisoning rate reaches its peak at Tan Binh commune with 36.56 cases/10,000 people, followed by Tien Loi with 31.45 cases. At the other communes like Dien Son, Long Khanh, Loc Thuan, and Loc Dien, the rate is 25 cases/10,000 people.

The average poisoning rate for every 10,000 people is 22.92 cases.

### 3.3.2 Poisoning cases categorized by age group and gender

Table 35:

No.	Age group	Number of cases	Percentage
1	15 – 29	33	16.58
2	30 – 39	66	33.16
3	40 – 49	57	28.64
4	50 – 59	27	13.56
5	60 – 76	17	8.54
	<b>Gender</b>		
1	Male	174	81.44
2	Female	25	12.56
	<b>Total</b>	<b>199</b>	<b>100</b>

**Comments:** The highest number of poisoning cases is with the groups aged between 30 – 39 (accounting for 33.16%) and 40 – 49 (28.64%). The poisoning rate is about 15% for people aged between 15 – 29 and 50 – 59. And notably, there are some cases with the older age group of over 60, accounting for 8.56%.

Most of the poisoning cases are found among men with 81.44%, only 12.56% are women (25 cases out of 199).

### 3.3.3 Type of poisoning pesticide

Table 36: Poisoning pesticide group

No.	Pesticide group	Number of types		Poisoning cases	
			%	Number	%
1	Insecticide	29	60.41	138	69.34
2	Fungicide	12	25.00	25	12.56
3	Herbicide	4	8.33	20	10.05
4	Nameless			16	8.04
	<b>Total</b>	<b>48</b>		<b>199</b>	<b>100.00</b>

**Comments:**

- Among the 48 types of poisoning pesticide, insecticide accounts for 60.41%, fungicide 25%, herbicide 8.33%.
- Poisoning cases caused by insecticides account for 71.85%, by fungicides 12.56%, and 10.05% by herbicides, in which poisoning by Gramoxone is only 1 case (0.5%).
- Most of the poisoning cases are caused by Padan (29.14%), Basa (10.55%). Other pesticides including Round-up, Monitor, 2,4-D cause 3.5% – 5% of the cases. The remaining 40 types of pesticides are responsible for only a few poisoning cases. (Please refer to **Appendix 3**)

### 3.3.4 Causes of pesticide poisoning cases

Table 37: Causes of poisoning cases

No.	Cause	Number	Poisoning rate (%)
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		of cases	In the survey area	Nationwide
1	Misuse	2	1.00	-
2	Commit suicide	24	12.06	86.5
3	While spraying	173	86.93	3.6
4	From food	0	-	9.2
5	Poisoned	0	-	-
6	Accidentally	0	-	-
	<b>Total</b>	<b>199</b>	<b>100%</b>	

**Comments:**

- **The poisoning rate at the survey area is 13.90/10,000 people, while the figure from local Preventive Medicine Centers nationwide is 7.19/100,000 people.**

- Most of the poisoning cases are found in people spraying pesticides (86.93%). Using pesticides to commit suicide account for 12.06% of the cases. There shows no case of pesticide poisoning from food or by accident. Misuse of pesticides causes only 1% of pesticide poisoning.

However, statistics from Preventive Medicine Centers nationwide show that most of the poisoning cases are found in people using pesticides to commit suicide (86.5%) while poisoning from occupational accidents is only 3.6%..3.5 Common symptoms when spraying pesticides

There are 36 common signs and symptoms of irritation among farmers who spray pesticides and Gramoxone. Please refer to Appendix 2 for more details.

There are 3,338 cases showing symptoms of irritation when spraying pesticides and 415 when using Gramoxone. Total number of pesticide users is 1,667 and Gramoxone users is 1,110.

Table 38: Common signs and symptoms of irritation and poisoning

Signs and symptoms	Pesticide		Gramoxone		RR	CI 95%	P
	Number	%	Number	%			
Irritation of the central nervous system	1,543	<b>46.28</b>	110	26.19	1.77	1.50 – 2.08	<0.001
Irritation of the respiratory system	505	15.15	112	<b>26.98</b>	0.50	0.43 – 0.60	<0.001
Excessive irritation of the endocrine tracts	499	<b>14.97</b>	14	3.37	4.44	2.63 – 7.47	<0.001
Excessive irritation of the stomach and intestine	129	3.87	18	4.28	0.90	0.56 – 1.46	>0.05
Irritation of the eyes	240	7.20	28	6.67	1.08	0.76 – 1.58	-
Excessive irritation of the muscles	36	1.08	0	0	-	-	<0.001
Irritation of the skin	378	11.34	90	<b>21.42</b>	0.53	0.43 – 0.65	<0.001

Irritation of the nails	8	0.23	43	<b>10.23</b>	0.02	0.01 – 0.05	
<b>Total cases</b>	<b>3,338</b>		<b>415</b>				

**Comments:**

Irritation of the central nervous system is the most common symptom (46.28%) among people spraying pesticide. Excessive irritation of the endocrine tracts accounts for 15%. The risk of having these symptoms among pesticide-users is 1.77 – 4.3 times higher than that of the Gramoxone users. 3.3.6 Health effects of pesticide poisoning

Table 39: Health effects of pesticide poisoning

No.	Consequence	No. of cases	Percentage
1	Death	5	2.51
2	Severe poisoning	32	16.08
3	Moderate poisoning	43	21.60
4	Mild poisoning	120	60.38
	<b>Total</b>	<b>199</b>	<b>100</b>

**Comments:**

- Pesticide poisoning causes 5 deaths among the 199 cases, accounting for 2.51%, severe poisoning 16.08%, moderate 21.6%, and mild poisoning over 60%.
- Most of the victims have pesticide poisoning once (73.36% of the cases), some have 2 or 3 times (14.57%, 12.06% respectively), mainly because of spraying pesticides.

3.3.7 Treatment of poisoning cases

Table 40: Treatment of poisoning cases

No.	Treatment	Number	Percentage
1	Drink fuller earth	0	0
2	Drink lemonade, green bean juice	76	38.19
3	Go to local medical center	61	30.65
4	Stomach Lavage	24	12.06
5	Cause to vomit	10	5.03
6	Take laxative	1	0.50
7	Injection	37	18.59
8	Intravenous transfusion	38	19.95

**Comments:**

- **There are various treatment methods for pesticide poisoning depending on the poisoning level, contact point, type of pesticide. Most of the mild poisoning cases are caused by contact with pesticide while spraying.**
- Intentional self-poisoning cases often result in severe poisoning and request professional treatment at local medical centers, accounting for more than 30% of the poisoning cases and all the self-poisoning cases must get emergency treatment at local medical centers.

**V. CONCLUSIONS:**

The survey on the use and management of pesticide (including Gramoxone) and its effects on human health at 16 communes of 8 provinces in Central and Southern Vietnam shows the following results:

### **1. The use and management of pesticide and Gramoxone:**

- More than 80% of the households in the survey use pesticides, with the major part (66.5%) using Gramoxone and the remaining 13.5% using other pesticide brands.
- Most of the respondents have used pesticides for more than 10 years (65.3%), 19.43% for 6 – 9 years, 14.5% for 2 – 5 years. The majority of the respondents (30.83%) spray pesticides more than 20 times a year.
- Gramoxone is in great demand between April and July, and has been used for the past two years by 45.22% of the respondents, for the past 3 – 4 years by 33.78%.
- There are 112 brands of pesticides currently in use, including 59 types of insecticides, 31 types of fungicides and 22 types of herbicides in the survey area. Even though Monitor and Wofatox have been banned in Vietnam since 1995, they are still in use at some of the communes in the survey.
- Spraying equipment is not in good condition: more than 90% of the sprayers are often leaking or clogged.
- Pesticide storage is left unchecked, with 15% of the households keeping pesticides in the kitchen, food cupboards or even in the bedroom. Most of the respondents do not have a safe place to store pesticides.
- The respondents do not have suitable safety gear for spraying.
- 73.48% of the respondents have never attended a pesticide safety use seminar. 47% do not understand the label color band, thus they are not aware of the pesticide toxicology.
- Public awareness programs on Pesticide Safety Use rank the lowest (only 8.9%) in comparison with other programs like Birth Control, Disease Prevention, etc.

### **2. Pesticide users' health issues:**

- The most common diseases among women are gynecologically related (7.07% of the 12 diseases). More people have troubles with the respiratory and digestive systems (2.46%, 2.34%), and with the ear-nose-throat (2.21%).
- The most common symptom among people spraying pesticides is irritation of the central nervous system (46.28%), followed by excessive irritation of the endocrine tracts with 15%. The risk of having these symptoms when spraying other pesticides is 1.77 – 4.3 times higher than that of Gramoxone users. This difference is statistically notable.
- Irritation of the respiratory system, skin and nails among Gramoxone users is quite high, from 10 – 26%. The risk of having these symptoms is 1.78 – 44 times higher than that of the non-Gramoxone users.

### **3. Pesticide poisoning situation:**

- There have been 199 poisoning cases between early 2000 and June 2001 at 14 communes in the survey. Tan Binh commune has the highest rate of poisoning, with 36.56 cases for every 10,000 people, followed by Tien Loi with 31.45 cases/10,000 people. The average rate at Dien Son, Long Khanh, Loc Thuan and Loc Dien communes is 25 cases/10,000 people.

- Among the 57 brands of poisonous pesticides, Padan causes the highest mortality rate of 29.14%, followed by Basa with 10.55%. Other brands cause 0.5 – 5% poisoning cases. There is only one Gramoxone poisoning case. 8% of the poisoning cases have unknown cause.
- 86.93% of the poisoning cases happen when people are spraying pesticide. Intentional use of pesticide for self-poisoning accounts for 12.06%.
- The mortality rate by pesticide poisoning is 2.51%. Severe poisoning accounts for 16.08% of all cases, moderate poisoning 21.6%, and mild poisoning over 60%.

## APPENDIX

### Annex 1. THE PESTICIDE CHEMICALS USED IN 16 HAMLETS

#### *1.1. Insecticides*

No	Brand	Toxic classification (WHO)	Chemical group	No	Brand	Toxic classification (WHO)	Chemical group
1	Karate			30	Dualvate		
2	Fastac	II	PY	31	Nitox		
3	Bassa	II	C	32	Bi58	II	OP
4	Basudin			33	Supercil		
5	Serpus			34	Tiodan		
6	Padan	II	C	35	“saùt truøng linh”		
7	Neptosin			36	Thiodan	II	OC
8	Decis	II	PY	37	Micin		
9	Regent	II	C	38	Ridomil (Fungicide)		
10	Sherpa			39	Netoxin	II	C
11	Mipcide			40	Sherzol		
12	Fenbis			41	Hopsan		
13	Butyl	V	TC	42	Demon		
14	Cypermethrin	II	PY	43	Vifenva	II	PY
15	Monitor	Ib	OP	44	Shezel		
16	Furadan			45	Azivo		
17	Trebon			46	Sumix		
18	Vitragiro			47	Diterex	III	OP
19	Wofatox	Ia	OP	48	Plytrin		
20	Beam (Fungicide)	II	C	49	Ekalux		
21	Bian			50	Phenat		
22	Mocap			51	Lancer		
23	Conpidor			52	Tiodal		
24	Lanate			53	Cidi		
25	Match			54	Confider		
26	Confider			55	Ofatox		
27	Ofatox			56	Pegasus		
28	Atapron			57	Sumix		
29	Diaphos						

### 1.2. Fungicides

No	Brand	Toxic classification (WHO)	Chemical group	No	Brand	Toxic classification (WHO)	Chemical group
1	Validacin	IV	C	17	M18		
2	Anvil			18	Volicen		
3	Tilt Super	III	C	19	Coc 85		
4	Win 80			20	Kenfidor		
5	Carbenzim			21	CuSO4		
6	Beam	II	C	22	Atomat		
7	Vimix			23	Mancozeb		
8	Desoral			24	Ridomil		
9	Rovral			25	Daconil		
10	Bendazol			26	Topxin		
11	Benzeb			27	Kasuran		
12	Bumper			28	Bourdeau		
13	Fungur			29	Vicarben		
14	Fuji-one	III	C	30	Zinep	IV	C
15	Beam			31	Alied		
16							

### 1.3. Herbicides

No	Brand	Toxic classification (WHO)	Chemical group	No	Brand	Toxic classification (WHO)	Chemical group
1	Sinus			12	Dipoxim		
2	2,4-D			13	Gardon		
3	Round-up			14	Nufarm		
4	Carborat			15	Gramoxone	II	
5	Sofit			16	Nabu		
6	Sanga			17	Star		
7	Echo	IV	C	18	Rhumini		
8	Glyphusal			19	Venus		
9	Bandit			20	Onecide		
10	Whame			21	Ronstar	III	C
11	Zico			22	Dual		

### Annex 2:

COMMON SYMPTOMS AND APPEARANCE WHEN USING PESTICIDES AND GRAMOXONE

No	Symptoms / Appearance	Pesticides		Gramoxone	
		# of people	% rate	# of people	% rate



<b>I</b>	<b>Central Nervous System</b>				
1	Fatigue	658	39.47	-	-
2	Dizzy	297	17.81	60	5.41
3	Headache	465	27.89	50	4.50
4	Hand shaky	43	2.57	-	-
5	Walking hard	61	3.65	-	-
6	Convulsion	6	0.35	-	-
7	Unconscious	8	0.47	-	-
8	Coma	5	0.29	-	-
<b>II</b>	<b>Over Muscle-strain</b>				
9	Muscle weakness	9	0.53	-	-
10	Cramp	8	0.47	-	-
11	Eyelid convulsion	19	1.13	-	-
<b>III</b>	<b>Gland Stimulation</b>				
12	Tearing	59	3.53	4	0.52
13	Excessive perspiring	197	11.81	10	0.90
14	Excessive salivation	243	14.93	-	
<b>IV</b>	<b>Eye Stimulation</b>				
15	Red eye	133	7.97	-	-
16	Eye itchy	125	7.49	24	2.16
17	Eye ulcer	2	0.11	4	0.36
18	Blurred eyes	107	6.41	-	-
<b>V</b>	<b>Respiration</b>				
19	Runny nose	81	4.85	49	4.44
20	Nose bleeding	5	0.29	4	0.52
21	Nose itching	107	6.41	-	-
22	Dry, sore throat	185	11.09	51	4.59
23	Cough	34	2.03	8	0.72
24	Chest pain	41	2.45	-	-
25	Difficult breathing	41	2.45	-	-
26	Noisy breathing	11	0.65	-	-

No.	Symptoms / Appearance	Pesticides		Gramoxone	
		# of people	% rate	# of people	% rate
<b>VI</b>	<b>Stomach Stimulation</b>				
26	Nausea	81	4.85	15	1.35
27	Vomiting	39	2.33	-	-
28	Abdominal pain	5	0.29	-	-
29	Diarrhoea	4	2.39	3	0.27
<b>VII</b>	<b>Skin</b>				
30	Cold skin	9	0.53	-	-
31	Itchy skin	260	15.59	55	4.95
32	Red rash	103	6.17	11	0.99
33	Skin ulcer	6	0.35	4	0.36
34	Dry, cleaving skin	-	-	15	1.35
35	Burning skin	-	-	5	0.45
<b>VIII</b>	<b>Finger nails</b>				
36	Losing color	5	-	39	3.51
37	Getting damaged	3	0.17	4	0.36
	<b>Total # of people spraying</b>	<b>1667</b>		<b>1110</b>	

**Annex 3:** PESTICIDES CAUSING POISONING CASES

No.	Pesticide	Chemical Group	# of people	Ratio
1	Padan	TS	58	29.14
2	Bassa	TS	21	10.55
3	2,4-D	DC	10	5.03
4	Monitor	TS	8	4.02
5	Round-up	DC	7	3.51
6	Euradan	TB	6	3.01
7	Cyper-alpha	TS	6	3.01
8	Methyl parathion	TS	6	3.01
9	Validacin	TB	5	2.51
10	Basudin	TS	5	2.50
11	Thiodan	TS	5	2.51
12	Bi-58	TS	5	2.51
13	Fuji-one	TB	4	2.01
14	Fatac	TS	4	2.01
15	Serpa	TS	3	1.50
16	Regent	TS	3	1.50
17	Folicur		2	1.00
18	Decis	TS	2	1.00
<b>No.</b>	<b>Pesticide</b>	<b>Chemical Group</b>	<b># of people</b>	<b>Ratio</b>
19	Mitox	TS	2	1.00
20	Anvil	TB	2	1.00
21	Moceps	TS	2	1.00
22	Nufarm	DC	2	1.00
23	Pegent		2	1.00

24	Nibas	TS	2	1.00
25	Rovral	TB	1	0.50
26	Zitrat	TB	1	0.50
27	Biotex	KT	1	0.50
28	Politrin	TS	1	0.50
29	Mossan	TS	1	0.50
30	Hopsan	TS	1	0.50
31	Selzol	TS	1	0.50
32	Viphensa	TS	1	0.50
33	Landnad	TS	1	0.50
34	Peripen		1	0.50
35	Gramoxone	DC	1	0.50
36	Somicavdah		1	0.50
37	Nominex	TS	1	0.50
38	Usstiad	TB	1	0.50
39	Malathion	TS	1	0.50
40	Azodrin	TB	1	0.50
41	Cymerin	TS	1	0.50
42	Netoxin	TS	1	0.50
43	Dinacin	TS	1	0.50
44	Cojsid	TB	1	0.50
45	Kitazin	TB	1	0.50
46	Ridomil	TB	1	0.50
47	Sincosin	TB	1	0.50
48	Unknown		16	<b>8.04</b>
	<b>Total</b>		<b>199</b>	<b>100%</b>

## EVALUATION ON GRAMOXONE USE MONITORING

(Conducted in 4 provinces: Khanh Hoa, Ninh Thuan, Binh Thuan, Lam Dong)

### I. MONITORING GROUP:

#### Group 1

### II. Areas monitored:

- Khanh Hoa: Dien Son ham let, Dien Lac hamlet – Dien Khanh town
- Ninh Thuan: Do Vinh Ward, Thanh Hai hamlet – Phan Rang

- Binh Thuan: Tien Loi hamlet and Phong Nam hamlet – Than Thiet
- Lam Dong: Lac Xuan hamlet and Lac Lam hamlet – Don Duong town

### III. Monitoring time:

July 04 – July 21, 2001

### VI. Monitored issues and evaluation:

#### 1. *Preparation and local support:*

The provinces' local relevant authorities have actively cooperated and provided the areas for the survey. They also advanced money for the preparation task.

- All the four provinces held necessary training courses for the would-be-interviewers to make a unique survey plan for all the hamlets: all training courses were well-prepared with full attendance from the local authorities, health department and key farmers in the hamlets
- During the survey period, the monitoring team also worked closely with some local officials and were well received and got good cooperation from these people on the survey
- The appointed hamlets all met with the survey requirements

#### 2. *On-site Gramoxone survey*

- 100% interviewers had been well trained or had trained others carefully before they conducted the survey
- The survey was done according to each of the area's geographic characteristics with the following key points:
  - + Survey to be conducted one to one (one hamlet after the other)
  - + The interviewers worked by group (01 interviewer + 01 local guide/group) penetrating into each group of villagers. The interviewers worked very hard since most of the time the interviewing required time outside work hours and had to be done out in the field. Especially for Lam Dong province, the interviewers had to work from 17:00 h – 22:00 h due to the villagers' working in the field.
- The interviewees were screened carefully to meet with the interviewing requirements and so the data collected from interviews was very objective and authentic
- The interviewers were very professional and experienced in working with the community and so the information obtained from interviews was relevant and accurate
- In general, the survey was conducted in the four appointed provinces with high concentration, all the data and information collected was accurate and reliable

#### 3. *Quick evaluation on the data from the interviews: \*\*\*\*\**

- Going through the reports, it is seen that in the survey, the ratio of families using Gramoxone is fairly high, the province with the lowest rate of using Gramoxone is even greater than 50% (Khanh Hoa), while the one with highest rate is up to 81.5% (Lam Dong)
- From the interviews, it was seen that in the four appointed provinces, most of the families used Gramoxone (used to be called "weed burning killer") to kill weeds and grass – this has been proven by the high ratio of use in Lam Dong where the villagers here have sprayed herbicides directly on vegetables to kill grass before.
- The Southern Central provinces (Khanh Hoa, Ninh Thuan, Binh Thuan) have not yet used much Gramoxone. Most of the interviewed households were just those who used Gramoxone for the "Farmers' Queries" Program a few years before. It was only in Ninh Thuan where there was a high number of household use of Gramoxone whilst in Khanh Hoa and Binh Thuan it was only a few. One basic reason the farmers here gave was that Gramoxone didn't kill weeds/grass completely (weeds came up again few

days after spraying) and that they were afraid Gramoxone 's quick action might cause damage to crops

- Despite of the farmers' feeling on Gramoxone's poisoning effects, the survey's result has revealed there wasn't any severe poisoning cases caused by using Gramoxone, except for some side effects, dizziness, perspiring, shakiness which often happens when being hungry. Otherwise those severe cases were noted as being caused by other pesticides
- For the interviewers, the questionnaire is clear and relevant except for the 3 faulty questions which are 5.6, 8.2, 8.19. The question often missed is 7.1
- As for the Company, the products haven't met with the users' wants. Generally, users prefer plastic containers than glass ones. Most farmers don't know much about the Company's products except for the highland vegetable-planting areas like Don Duong, Lam Dong.

#### **4. Recommendations: \*\*\*\*\***

- Through the survey result and with cooperation with the interviewers, we would like to make some recommendations:
  - *For the Health Training & Prevention:*
    - \* There should be detailed and unique written instructions on how to answer the quantitative questions to avoid blank or incorrect answers
  - *For the Company:*
    - \* Need to hold training courses to educate farmers on the advantage/effect and toxicity of Gramoxone to assist with the farmers' understanding about this herbicide\*
    - \* Need to vary the packaging to meet with users' wants

## **Group 2**

### **EVALUATION ON GRAMOXONE SURVEY**

(In 4 provinces: Binh Duong, Binh Phuoc, Dong Nai, Tien Giang)

Phung Thi Thanh Tu

Nha Trang Pasteur Institute

#### **I. Survey areas:**

- |              |   |                                    |
|--------------|---|------------------------------------|
| - Binh Duong | : | Hoa Loi hamlet, Loc Thuan hamlet   |
| - Binh Phuoc | : | Loc Dien hamlet, Loc Ninh hamlet   |
| - Dong Nai   | : | Thanh Binh hamlet, Cay Gao hamlet  |
| - Tien Giang | : | Long Khanh hamlet, Tan Binh hamlet |

#### **II. Survey period:**

July 11 – July 23, 2001

#### **III. Contents:**

##### **1. Preparation:**

- The four provincial Health and Prevention Centres have cooperated and chosen the survey areas to meet with requirements and make it easy for the survey execution. They also advanced some money for the survey.

- All the four Health and Prevention Centres held training courses with a unique plan and execution method for all the appointed survey areas. The training was conducted with participation from the local authorities, health department and key farmers
- During the survey period, the team worked closely with the above four provincial officials and found out that they very much supported this kind of survey due to the benefits offered to their village
- The appointed areas for the survey were all met with the requirements

## **2. About the Gramoxone survey:**

- All the interviewers had been well trained before the survey was conducted
- The survey was executed accordingly to each of the area's characteristics by:
  - + Conducting the survey one to one (one hamlet after the other)
  - + The interviewers worked very hard. They had to work outside their regular working hours
  - + When conducting interviews, the interviewers invited the listed farmers to a well-accommodated place one by one and so the interviews were done well with detailed information as required (especially well done in Binh Duong, Binh Phuoc)
- The interviewees were screened before they were brought to the survey and so the data collected was correct and authentic (whoever came first was interviewed first)
- The interviewers are experienced in working with the community and so the data collected is accurate and relevant
- The survey was done well in the other 3 provinces with reliable data. For Tien Giang itself the survey couldn't be conducted due to the Health and Prevention's request for one-week delay

## **3. Quick evaluation on the input data:**

- Going through the survey data, it was seen that the rate of families using Gramoxone is fairly high
- Most of the families use Gramoxone to clean weeds and grass before they plant a new crop or before they do land reclamation (Gramoxone is called the "grass-burning killer"). In Binh Duong, Binh Phuoc, Dong Nai, farmers often use Gramoxone to kill grass for corn, industry plants, fruit trees and rice.
- Farmers were first afraid of Gramoxone poisoning, but later on when they were instructed carefully about usage instruction and safety, they became interested in it very much due to its effectiveness and in fact there wasn't any poisoning cases caused by Gramoxone
- There are a few questions with incorrect answers: 8.11, 8.17
- Users tend to use plastic containers rather than glass ones.

## **4. Recommendations:**

- Through the survey conclusions and with cooperation from the interviewers we would like to recommend the following:
  - + *For the Health and Prevention Centre:*  
Need to instruct and explain to the interviewees how to answer the quantitative questions correctly to avoid missing information or inaccurate answers
  - + *For the company:*  
Need to hold training courses to educate farmers on Gramoxone's effectiveness and safety use to avoid misunderstanding with other herbicides.

# REPORTS ON PESTICIDE AND GRAMOXONE MANAGEMENT AND USAGE LABOURERS' HEALTH IN BINH PHUOC PROVINCE

Binh Phuoc Health and Prevention Centre

## I. SITUATION AND GEOGRAPHIC CHARACTERISTICS:

Binh Phuoc is a highland province in the South East area with a total of 6,853.81km<sup>2</sup> and a population of 730,778 in which the ethnic minority groups rate about 20% (Khermae, Tay, Nung, Satieng). The province is founded with 01 town and another 05 districts with a total of 80 wards. In addition, there are also 04 state-owned Rubber companies equipped with clinics. The North with a 240km<sup>2</sup>-length border line between Cambodia has developed mainly with farming. Industrial trees occupies a fairly large area, and the people here have to use pesticides to protect crops for a good harvest.

The pesticides' effect on these labourers' health is very high. There are about 201 store-houses and wholesalers in the province with a huge variety of pesticides that can't be controlled completely whilst the farmers are not equipped with enough knowledge of how to store and use pesticides safely.

The pesticide usage situation in farming nowadays is a serious matter that needs to be attended to very carefully. In order to raise farmers' awareness on the matter, the Health and Prevention Department of the Health Ministry has held training classes on the above for the 8 provinces including Binh Phuoc as a first step in the 'health care' program for the people.

## II. SURVEY:

- Quick survey
- Survey period: July 10 – July 20, 2001

## III. SURVEY FINDINGS:

- *Form 1:* 02 samples

Has been seen that all of them are doing farming and are using pesticides to protect crops

- **Form 2:** 200 samples

In which the households using Gramoxone were picked up to consider the rate of the farmers using Gramoxone. Results found that 184/200 households are using Gramoxone, with a rating at 92%

- **Form 3:** 48 samples

Through interviewing 200 households for the poisoning cases, it was found out that 41/200 cases were poisoned with pesticides due to unsafe pesticide usage.

#### **IV. EVALUATION:**

##### **- Preparation and execution of a unique technique:**

The Health and Prevention Centre invited all levels of attendees for the training. These people also supported the survey very much. Henceforth, the team was very well received and cooperated with the local authorities during the survey conduction. The survey was well executed and completed according to what the Health & Prevention Ministry and Department had instructed.

##### **- Survey findings analysis:**

Going through the 200 samples Form 2, it was found out that Gramoxone was used by 184/200 households (92%). This rating doesn't point out how much quantity of Gramoxone was used in comparison with other herbicide since the survey form was done accordingly to Syngenta's request.

##### **- Safety Kit:**

The labourers/farmers all have known about pesticides' poison effect but they still haven't used necessary safety kits/methods all the time to protect themselves when using pesticides. Henceforth, there were still many poisoning cases during or after pesticide applications.

##### **- Essential information:**

The farmers lack of information concerning the pesticide storage and usage. They tend to care only about which insecticides, or fungicides or herbicides that can treat their crops fast and effectively but neglect all information about the pesticides' poison effects on their health.

The poisoning cases during pesticide usage were also happening with those who were hired to work temporarily. With these people, the contact times with pesticides and duration lasted long enough to cause poisoning cases which sometimes lead to death.

When faced with pesticide poisoning situations, farmers apply one simple method for all cases since they haven't been trained about how to react to individual cases for each kind of pesticide.

Farmers usually carelessly dispose all containers, bottles, etc... after use anywhere. They didn't collect all containers and dispose them correctly and this has been causing bad pollution for the living environment.

\*\*\* In short, through the survey execution in Loc Ninh, Binh Phuoc Province, it is found that pesticide management hasn't been paid good enough attention. The labourers/farmers, due to lack of knowledge on pesticide safety use, didn't care for their own health and used massively any kind of pesticides on the market that they are able to purchase. Henceforth, it is necessary to find out a solution to the pesticide management and usage in order to protect themselves and everybody in the community in general.





## **CONCLUSIONS:**

**1/ Pesticide Management:** There are now many pesticide retailers everywhere in communes and villages and therefore most of the farming households don't store pesticides at home. Instead they buy them from these retailers for one time spray only when in need.

A few that store pesticides at home have good storage conditions since all pesticides are now packed in good containers in small quantities, so they don't cause environment pollution when farmers store or use them.

### **2/ Pesticide usage:**

The pesticides used now are of different kinds and categories. Farmers tend to use pesticides by information obtained from newspapers, radio, TV... especially from advice and instructions from their neighbours with good results. Some farmers use pesticides according to the instructions on labels but some others still use them at their own discretion (e.g. reduce pesticide rate when there are only few insects, increase rate if there are many insects, etc...). Still there are some cases when farmers just do a simple mixing of many kinds of pesticides for a one time spray.

### **3/ For Herbicide use only:**

The herbicides used mainly are Sofit, Meco, Echo, Gramoxone... Through the survey, it was found that farmers prefer using Sofit, Meco rather than others due to its control of weeds, easy usage, acceptable prices, and they don't cause any ill effects at all to rice and other crops. *For Gramoxone itself, (in fact farmers can't remember the name of the product, they describe it as a blue herbicide only) farmers said it kills emerging grass very fast but it can't kill weeds. They also said Gramoxone is very good for killing grass in large high land or on hills. There were also some farmers saying that Gramoxone if over sprayed and dropped into rice or other crops that are near the spraying area, it will cause some damage.*

### **4/ Impacts on labourers/farmers' health:**

- 73 poisoned cases in which:
  - + 12 suicide cases (01 caused by Furadan)
  - + 61 minor cases during spraying which they cured themselves at home
- Many poisoned symptoms during spraying, especially PADAN
- **For GRAMOXONE itself, according to what farmers claimed during the survey, no poisoning cases were found with GRAMOXONE in use.**

**MINISTRY OF HEALTH  
HEALTH AND PREVENTION DEPARTMENT**

**PLAN FOR 2003**

**Pesticide SAFETY USE AWARENESS AND  
POISON PREVENTION FOR  
AGRICULTURAL workers**

## **HANOI – 1/2003**

**1. PROJECT TITLE:**

pesticide SAFETY USE AWARENESS AND POISONING PREVENTION FOR  
AGRICULTURAL workers

**2. PROJECT MANAGEMENT:** MINISTRY OF HEALTH

**3. PROJECT IN-CHARGE:**

Doctor Nguyen Thi Hong Tu, Deputy Director of the Department of Preventive Medicine

**4. SURVEILLANCE allocation:**

10 agriculture key provinces using pesticide: Binh Dinh, Lam Dong, Dac Lak, Ninh Thuan, Binh Duong, Binh Phuoc, Dong Nai, Kien Giang, An Giang, Long An

**5. COOPERATION AGENCIES/COMPANIES:**

- Syngenta VN Company
- Institute of Epidemiology and Hygiene, Nha Trang Pasteur Institute,
- Hygiene and Community Health Institute of Ho Chi Minh City
- Hanoi Medical University, Bach Mai Anti-Poison Central Hospital
- Provincial Prevention Centres and District Health Centers in the 10 agriculture key provinces using Pesticide and Gramoxone

**6. PROJECT TIMING:** 01 year (2003)

# PROJECT CONTENT

## I. ISSUE RAISED:

In 2001, the Department of Preventive Medicine of MoH and the provincial Medical Prevention Centres of the 8 key agriculture provinces using Gramoxone in VN Central and Southern areas (Khanh Hoa, Lam Dong, Ninh Thuan, Binh Thuan, Binh Duong, Binh Phuoc, Dong Nai, Kien Giang) conducted a survey to evaluate pesticide and Gramoxone management and usage as well as the labourers' health on 1667 agriculture labourers in 8 provinces and 16 communes as a model sample.

The survey findings revealed that within the 16 surveyed communes, the ratio of households using pesticides was greater than 80%, and that of those using Gramoxone was at 66.5%. The households using Gramoxone for 02 years now rates at 45.22%, where as that of 3-4 years ago was 33.78%, and 5-6 years ago was 15.49%. The peak consumption time for Gramoxone is from April till July every year.

The pesticides used by the surveyed areas comprises of a wide range of products which cannot be controlled well due to pesticide retailers/agencies presence everywhere, average 2-3 selling points in one area/commune. At the moment there are 112 kinds of pesticides used by the surveyed areas in which there are 59 Insecticide brands, 31 Fungicide brands, and 22 Herbicide brands. There are still a few communes using Monitor, Wofatox which have been banned in VN since 1995.

The pesticide users do not have good storage and safe enough hygiene. Survey results have shown that most of the farmers bought and used any type of sprayer. Over 90% of these sprayers leaked or got blocked. Until now there isn't any group or organization doing regular checking on these sprayers.

The pesticides are still not under good management yet: there is still 15% households storing pesticides in the kitchens, in kitchen cupboards, or even in the bedrooms. Most of the households don't have a good and safe place to store pesticides.

Most of the people when spraying don't wear suitable safety clothing.

Through the survey on pesticide users' awareness and knowledge, it was seen that 73.48% of the interviewees haven't attended any training on pesticide safety use. 47% users don't understand at all about the poison severity of the color codes on product labels. Also the rating of public information training on pesticide safety use to farmers/villagers is the lowest in comparison with other public communication such as Family Planning, Diseases Prevention, etc...

On the pesticide users' health condition, among the 12 disease groups, the female gynecology rates are the highest at 7.07% of the total female population in the commune. The diseases concerning respiratory, digestion, and facial/dental also have a rather high rating in comparison with other diseases, at 2.46%, 2.34%, and 2.21% respectively, of the total interviewees.

The central nervous system symptoms caused by pesticide spraying rate highest – 46.28%. The gland over-stimulating symptoms rate at 15%. In comparison to the group spraying Gramoxone, these ratings are very far different ( $p < 0.001$ ). These symptoms when spraying pesticide are much higher at 1.77 – 4.3 than those when using Gramoxone.

With Gramoxone, the symptoms have a concerning respiratory, skin and nails rate rather high at 10-26% which is much different ( $p < 0.001$ ) from that of the groups spraying other pesticides. The risk of getting symptoms on respiratory, skin and nails when spraying Gramoxone is as 1.7-4.4 higher than those when spraying other pesticides.

For the pesticide poisoned cases, there were 199 pesticide poisoned cases from 2000 till June 2001 in the 14 surveyed areas. The pesticide poisoned rating thru 10,000 surveyed people is found highest in Tan Binh Commune which is up to 36.56 cases/10,000 people.

Among the 57 kinds of poisonous pesticides used, Padan is the highest used poisonous pesticide with 29.14%. Basa at 10.55%. Other pesticides are from 0.5-5%. There was only 01 poisoning case with Gramoxone in all of the total surveyed interviewees. 86.93% poisoning cases happened while spraying. 12.06% are intentional cases.

Death caused by pesticide poisoning is 2.51%. Severe poisoning cases rates at 16.08%, not very severe ones at 21.6%, mild cases at 60%.

Through the survey conducted in 2001, to strengthen pesticide management and usage, to ensure of the safety and hygiene conditions and raise the pesticide and Gramoxone users' awareness, the 2001 plan is recommended with the following:

- Raising skills of Medical Preventive Centres as well as local district Health Centers in recognising and working with pesticides' harmful effect on worker's health. To enhance local clinics with both manpower and equipment, especially for commune clinics to enable them to provide health care services as well as agriculture services
- To increase training courses and public media on pesticide hygiene and safety usage and health protection methods for the agricultural workers. To hold training on pesticide safety use, how to recognise the colour code on product labels, also the symptoms of poisoning and to provide users with first aid for emergencies.
- Supply medical clinics and Health Centres in agricultural communes with antidotes. As a first step, provide Fuller Earth antidote for commune clinics and local health centres in areas with high pesticide usage.
- Distribute POS and brochures on pesticide and agricultural machinery safe use.
- In 2001, Gramoxone was de-restricted and put on the pesticide-for-use list in Vietnam. Since this kind of pesticide is very new for Vietnam, it has been shown through the survey that there are still conflicts and confusion in using this herbicide safely and effectively. Therefore in 2002-2003 plan it is urgent and necessary to

raise pesticide and Gramoxone poisoning prevention and safety use for agricultural workers.

## **II. PROJECT OBJECTIVE:**

### *2.1. General objective:*

**To raise pesticide and Gramoxone poisoning prevention and safety use for agricultural workers.**

### *2.2. Detailed actions:*

1. Train and educate agricultural workers on pesticide and Gramoxone poisoning prevention and safety use awareness in key provinces with high pesticide usage
2. To enhance skills on pesticide and Gramoxone poisoning prevention and treatment for all channels.

## **III. PROJECT'S OBJECTIVE ACTIONS:**

1. Draft documents on training and education on pesticide and Gramoxone poisoning prevention and safe – effective usage.
2. Design and distribute POS and prints on pesticide and Gramoxone poison prevention and safety use.
3. Support to hold 02 training courses for medical officials and concerned departments (01 for VN central + 01 for the South) on pesticide and Gramoxone poisoning prevention and effective – safe use.
4. Support Health and Prevention Centres in 10 provinces with training courses on raising Gramoxone effective and safe use for the two groups: the Health officials/concerned departments and Gramoxone users.
5. Enhance skills for local medical clinics on emergencies and Pesticide antidote.

## **III. ATTENDEES AND METHODOLOGY:**

**Activity 1: Draft information for training courses for the two groups: Medical officials/concerned departments and pesticide users**

- Cooperation with labour and medical health specialists
- Discussions/conference to complete a unique training documents
- Assignments for training study and drafting
- Collect information for writing and revision to be used for publication
- Bind documents and distribute to relevant local officials for project execution

**Activity 2: Hold 02 training courses as first examples for 02 groups:**

- The VN Central Group: Cooperation with Nha Trang Pasteur Institute
- The Southern Group: Cooperation with Ho Chi Minh Public Hygiene and Medical Institute
- The trainers are from the VN North: The Department of Preventive Medicine, National Institute for Occupational and Environmental Health, Hanoi Medical University, the Central Hygiene and Epidemiology Institute
- The attendees of the training for medical officials and relevant departments are those of the Provincial Medical Preventive Centres, the Health Preventive Team and anti-poison departments of the local Medical Centres of the above provinces The total attendees for the training courses is 120 persons.

**Activity 3: Support the 10 Health and Prevention Centres to organize training courses for the two groups: 01 training course for the medical staff and relevant departments plus other two courses for the farmers/agricultural workers.**

***Place and Attendees:***

10 key agricultural provinces using pesticide and Gramoxone representing the South and the North are: Lam Dong, Binh Dinh, Ninh Thuan, Dak Lak, Binh Duong, Binh Phuoc, Long An, Tien Giang, Dong Nai, An Giang. Trainers for these training courses were trained from Activity 2.

- Each of the provinces conducts one training course for the medical staff and relevant departments
- Each of the provinces conducts two training courses for Gramoxone users.

**Activity 4: Write and print media documents on pesticide and Gramoxone antidote and safe use**

- Cooperation with the Medical and Labour Institute, Syngenta VN Company, Bach Mai Antidote Centre (Bach Mai Hospital). Design leaflets on pesticide safe use, as well as booklets on emergency first aid for pesticide and Gramoxone poisoning
- Print 20,000 leaflets, 1000 brochures on pesticide and Gramoxone poisoning first aid and 1000 booklets on pesticide Gramoxone safety use, antidote and emergency first aid.

**Activity 5: Enhance skills for local clinics on pesticide and Gramoxone emergency first aid.**

- Provide local clinics in the 10 key provinces using pesticide and Gramoxone with media documents and booklets on first aid of poisoning.
- Provide Fuller’s Earth to Medical Centres in the 10 key provinces.

**pesticide and GRAMOXONE SAFETY USE AWARENESS AND ANTIDOTE PLAN FOR AGRICULTURAL WORKERS YEAR 2003**

<b>No</b>	<b>CONTENTS</b>	<b>BUDGET (mil. Vnd)</b>	<b>IN-CHARGE PERSON</b>	<b>COOPERATION FROM</b>
1	Design and print the training materials for the two groups: - Medical Staff and concerned depts. - Agricultural workers	15	Health and Prevention Dept.	- Syngenta Co. - Medical Study and Labour Institute - Hanoi Medical University - Bach Mai Anti-Poisoning Centre
2	Design and print media materials on pesticide and Gramoxone safety use and antidote (20,000 leaflets, 1000 booklets, 1000 first aid brochures)	55	Health and Prevention Dept.	- Syngenta Co. - Medical Study and Labour Institute - Hanoi Medical University
3	Hold training courses for medical staff and concerned departments in the two	60	Health and Prevention Dept.	- Syngenta Co. - Medical Study



	areas (02 TOT classes)			and Labour Institute - Hanoi Medical University - Nha Trang Pasteur Institute - HCM Public Health and Hygiene Institute
4	Support the Provincial Medical Preventive Centres in the 10 provinces to organize training courses for medical staff and concerned departments (10 courses)	60	Provincial Medical Preventive Centres (10)	Medical Preventive Centres
5	Train farmers on pesticide and Gramoxone usage (20 training courses)	80	Provincial Health and Prevention Centres (10)	- Local Medical Preventive Centres - Local Plant Protection Dept. - Farmers' Organization
<b>No</b>	<b>CONTENTS</b>	<b>BUDGET (mil. Vnd)</b>	<b>IN-CHARGE PERSON</b>	<b>COOPERATION FROM</b>
6	Enhance skills for local clinics on pesticide and Gramoxone emergency first aid: Provide Fuller Earth antidote and first aid brochures	Free-of-charge	Syngenta Co.	Medical Preventive Dept. of MoH
7	Operation Budget	30	Medical Preventive Dept.	
	<b>Total</b>	<b>300 million vnd</b>		

PROJECT DIRECTOR

**Nguyen Thi Hong Tu**