PAN Germany

Paraquat and Suicide

The highly toxic pesticide paraquat is used as a major suicide agent in many developing countries

Pesticides are often extremely toxic. The consequences of its use are far-reaching and incalculable. Basic human needs - food, clothes, housing - can be satisfied without the use of toxic pesticides. PAN Germany provides information on pesticide risks and campaigns for alternatives.

Fact Sheet 2003

Paraquat and the „Stop paraquat“ campaign

The non selective herbicide paraquat - a pesticide that kills a broad range of weeds - is sold by Syngenta and other producers in more than 100 countries mainly under the brand name Gramoxone. It is extensively used on bananas, cocoa, coffee, cotton, palm oil, pineapple, rubber, and sugar cane, both on plantations and by small-scale farmers. Paraquat is highly acutely toxic, with no known antidote. Less than one teaspoon, if ingested, is fatal. It is also blamed for causing severe acute and long term health problems such as severe dermatitis, kidney failure, respiratory failure, rapid heart rate, second degree burns, skin cancer and Parkinson's disease. Furthermore paraquat is commonly used as a suicide agent in many developing countries.

Due to its high toxicity paraquat is part of the Dirty Dozen List. PAN International launched the Dirty Dozen campaign in 1985 to target a list of extremely hazardous pesticides for banning or more strict controls, and to advocate their replacement with safer and more sustainable pest control methods. In order to accelerate the phase-out of paraquat, several non-governmental organisations (NGOs) from Asia, America and Europe (including PAN Germany) launched the "Stop paraquat" campaign in 2002. This campaign, which urges Syngenta to stop paraquat production, has already achieved some remarkable results, Malaysia banned paraquat in August 2002 – one of the first Asian countries to do so - and Chiquita decided to ban paraquat from all its banana plantations.

Intentional Pesticide Poisoning

Deliberate self-poisoning with pesticides lead to several hundred thousand cases of death every year. The *Global Burden of Disease* estimated that 798.000 people died from deliberate pesticide poisoning in 1999, over 75% of whom were from developing countries (Murray/Lopez 1996). Pesticides are the most important method of self-poisoning in many rural regions and are associated with a high death rate (Eddleston, 2000). The World Health Organisation (WHO) estimates that at least 2 million intentional pesticide poisoning cases occur every year, resulting in 200.200 deaths (WHO, 1990). According to the WHO 91% of all cases of death (the overall number of fatal intentional and unintentional pesticide poisonings, is specified with 220.000) are due to intentional pesticide poisonings (WHO, 1990). This estimation is backed up by a study from Sri Lanka (Hettiarachchi/ Kodithuwakku, 1989), which revealed that about 73% of all cases due to pesticide poisoning were intentional; 93% of all fatal cases were deliberate. Significantly higher estimations were made by Jerayaratnam (1990). He estimates around 25 Million cases of pesticide poisoning every year. Based upon assumptions of the above (WHO, 1990), concerning the quota of fatal suicide cases, this

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would result in an even higher total number of suicide cases.
Among all those pesticides used as suicide agents, paraquat plays a key role.

Intentional Paraquat Poisoning

Paraquat can be described as a „major suicide agent“ (Dinham, 1996) in many countries because:

1. It is highly acutely toxic (one teaspoon is fatal)
2. No antidote exists
3. It is readily available (like many pesticides)
4. It is relatively cheap

Being highly acutely toxic, with no known antidote, paraquat poisonings result in a very high fatality rate, compared with other suicide chemicals (Hettiarachchi/Kodithuwakku, 1989), although the ingestion of other pesticides (e.g. organophosphate) can also lead to high fatality rates (Eddleston, 1999). Fatality rates for intentional paraquat ingestion range from 58% in Fiji (Booth, 1998) to nearly 80% in Southern Mexico (Tinoco et al., 1993).
As has been seen in studies from different countries, the ’’intent to commit suicide was the most commonly expressed motive for paraquat ingestion“ (Tinoco et al.,1993). Each year around the world there are estimated to be more than thousands of suicides due to paraquat ingestion, though problems with poor reporting and data collection in developing countries mean that the real magnitude of the problem is not known. Although the WHO does not maintain global statistics, neither for unintentional nor for intentional paraquat poisonings, relevant regional-data does exist.
Paraquats role as a major suicide agent has been proved by numerous studies which researched the different agents used in suicides. An epidemiological evaluation was conducted on 270 patients who died at the general hospital, Port Spain (Trinidad and Tobago), “after presenting with deliberate self-poisoning between January 1986 and June 1990” (Hutchinson et al., 1991).The causes of death were confirmed by autopsies and toxicological analysis.
Paraquat was the most popular poison used in 63% of the suicidal cases, and other agrochemicals were used in just 20% (Hutchinson et al., 1991). Forensic analysis of fatal intentional poisoning in South Trinidad showed that of 105 deaths from poisoning in 1996-97, paraquat was the causative agent in 80 cases (76%) (Hutchinson/Daisley 1999; Hutchinson et al., 1999). Hettiarachchi and Kodithuwakku (1989) describe paraquat as the “most common poisoning agent“ in their study. In nearly half of the cases[1] the agrochemical used was the herbicide paraquat. In Samoa paraquat is blamed for being used as a suicide agent in 70% of all suicide cases between 1979 and 2000 (Le Samoa, 2001).

Table1: Percentage of overall suicide-victims in three countries/regions using paraquat as a suicide-agent

Country	Time Period	Per-centage	Source
Trinidad and Tobago	1986 - 90	63 %	Hutchinson et al., 1991
South-Trinidad	1996 - 97	76 %	Hutchinson/ Daisley, 1999
Samoa	1979 - 2001	70 %	Le Samoa, 2001

Easy Availability of Paraquat

Some studies do suggest that the easy access to a potent substance, in this case paraquat, increases the number of suicides and may result in death when in fact there was no definite intention on the part of the victim to commit suicide.
In Sri Lanka it was observed that ’’two of the three peaks of seasonal incidence of paraquat poisoning [intentional and unintentional] are related to the most common time of use of paraquat“ (Hettiarachchi/Kodithuwakku, 1989).
In Surinam a link was revealed between the monthly incidence of paraquat poisoning and the volume of monthly paraquat imports (Perriens et al., 1989). The example of Samoa (Figure 1) shows clearly how the number of suicides correlates with the arrival of paraquat

[1] Agrochemicals were responsible for 59% of intentional and unintentional poisoning cases. Among those agrochemicals, paraquat was the most common one used in nearly 50% of the cases (Hettiarachchi/Kodithuwakku, 1989).

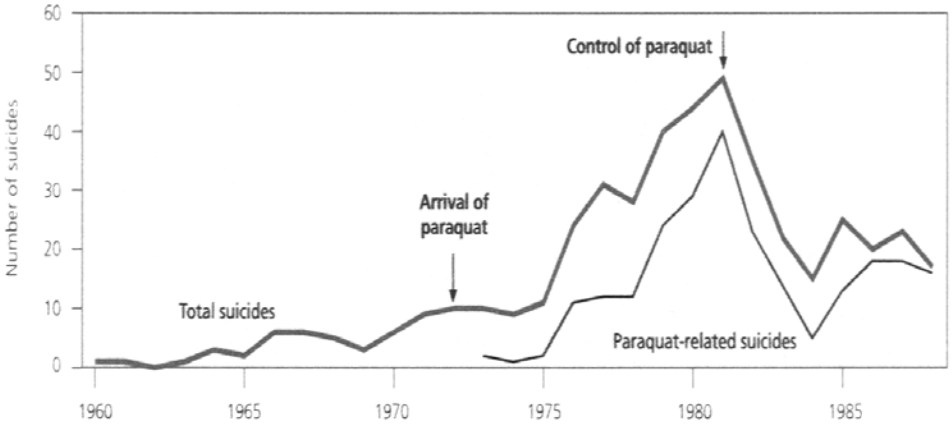

Figure 1:

Number of sucides in Samoa in relation to the arrival of pesticides containing paraquat and the control of sales of paraquat

(source: Bowles, 1995)

and the control of sale a few years later. Up until 1972, when paraquat was first introduced into the country, the number of suicides was below 10. The number began to rise sharply in the mid-1970s and reached nearly 50 in 1981 (in almost 40 cases paraquat was the causative agent!), when efforts to control the availability of paraquat began. During this period, suicides rates increased by 367%, from 6.7 per 100.000 in 1972 to 31.3 per 100.000 in 1981. Within 3 years after controlled paraquat sales, suicide rates had dropped back to 9.4 per 100.000 (WHO, 2002).

Safe use of paraquat?

Although there have been attempts and measurements[2] from Syngenta (the main paraquat producer) to make their product safer in order to avoid intentional and unintentional poisonings, their results are neither satisfying nor sufficient. Contrary to the manufacturers claim that safe use practices and training have decreased the number of suicides, recent data from developing countries do not sustain this claim.

For example, an increase in paraquat suicides has been documented in Costa Rica (Wesseling et al., 2001).

Even the control and restriction of paraquat sales does not necessarily mean that paraquat is not commonly used as a suicide agent anymore. Although the overall number of suicides has decreased in Samoa since the control of Paraquat sales (Figure 1), it still accounts for between 50% and 60% of fatal suicide cases for the years 1999-00 (Le Samoa, 2001).

Conclusion

It can be concluded from this paper that the highly toxic pesticide paraquat must be seen as a major suicide agent in many developing countries. Its misuse for deliberate self-poisoning results in a high mortality rate and causes thousands of deaths every year. Limitations on the availability of paraquat to professional users may mitigate the problem, conditional on the successful enforcement of tight regulations; PAN Germany sees the only option being a complete paraquat-ban and production-stop.

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[2] In the late 1980s paraquat manufacturers added a blue pigment, a stenching compound, and also an emetic to many formulations of paraquat to help avoid severe poisonings due to oral intake. Another measurement was the launch of the 'Global Safe Use Project' by the pesticide industry in 1991 in order to train pesticide operators in developing countries.

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For more information

on the „Stop paraquat“ campaign and on paraquat see the homepages of the organizations that support the „Stop paraquat“ campaign: Erklärung von Bern (Schweiz) www.evb.ch; Banafair e.V. (Deutschland) www.banafair.de; Bio Suisse (Schweiz) www.bio-suisse.ch; Central American Institute for Studies on Toxic Substances (IRET), Costa Rica; Fédération genevoise de coopération (Schweiz) www.fgc.ch; Foro Emaus (Costa Rica) www.foroemaus.org; Swedish Society for Nature Conservation www.snf.se; Pesticide Action Network Asia Pacific www.panap.net; Pesticide Action-Network Europe www.pan-europe.net; Pesticide Action-Network Germany www.pan-germany.org; Pesticide Action-Network Latin America (RAP-AL) www.rap-al.com; Pesticide Action-Network North America www.panna.org; Pesticide Action-Network UK www.pan-uk.org; Red de Accion sobre Plaguicidas y Alternativas en México (RAPAM)

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- Paraquat Exposure and Parkinson`s Disease, 06/2003
- Paraquat and Suicide, 07/2003