

The Problem of Endosulfan

By Jutta Hammer, Alexandra Baier and Susanne Smolka

Table: Cases of poisoning and deaths in Benin during a study by PAN UK, in cooperation with PAN Africa and OBEPAB, January 2001 to July 2003.

Product/Active Ingredient	Endosulfan	Cotalm	Dursban	Decis	Tiktac	DN	Cystoate	unbekannt
Poisonings	347	73	26	4	1	9	0	11
Deaths	53	9	8	0	0	0	9	13
Total accidents (Poisonings +Deaths)	400	82	34	4	1	9	9	24
Deaths - % of total accidents	13	11	24	0	0	0	100	54

Source: PAN UK (2003): Effects of pesticides on the health of cotton-growing families in West-Africa

Allround insecticides with many side-effects

Endosulfan was used as an active ingredient in many pesticides as early as 1956. It has a wide range of use as an insecticide and plays an especially important role in cotton cultivation, as cotton in conventional production is particularly susceptible to pests and disease. In particular, endosulfan is used against one of the main cotton pests, the boll weevil *Helicoverpa armigera*.

Endosulfan is introduced to the environment via many retail products, (Thiodan being the most well-known worldwide), which are used on farms and cultivation areas. Apart from the previously mentioned use in cotton cultivation, the active ingredient is also used on tea and coffee plantations or in vegetable cultivation, as well as in fruit growing and in forestry. It is also used as a wood preservative.

Due to its broad-band effectiveness against insects and mites it is universal-

ly used as a form of contact poison or stomach insecticide. In addition, as its patent has now run out it is cheaply available on the market.

Therefore, as it is less expensive endosulfan is still used, especially in poorer countries.

As endosulfan is not aimed at a particular type of insect, other non-target organisms are also endangered. However, endosulfan is mainly associated with the many cases of poisoning which occur every year, mainly in developing countries.

The World Health Organisation (WHO) has classified endosulfan as moderately dangerous due to its poisonous effects (Danger Class II); the American Environmental Agency EPA classifies endosulfan as highly dangerous.

PAN Asia and PAN Africa have long been campaigning for a worldwide ban on endosulfan due to frequent cases of poisoning. The substance is too dangerous

for people in developing countries who are frequently illiterate and often do not have protective clothing.

Variety of poisoning possibilities

Pesticides do not only enter the body by using them directly. Many cases of poisoning occur due to contaminated drinking water and food which contains residues of endosulfan. Even smoke from a cigarette, the tobacco of which contains residues of endosulfan, can lead to poisoning as can contact with contaminated ground.

Realities in developing countries ignored

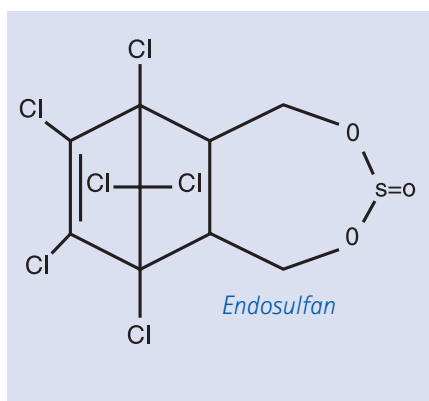
Pesticide manufacturers recommend the use of gloves, glasses, long clothing and a breathing mask when handling pesticides. However, in developing countries reality is sometimes very different. Under conditions of poverty, pesticides are usually handled without any protective clothing whatsoever. The climatic conditions also make the wearing of protective clothing in high temperatures a torment. Recommendations given by



manufacturers are not suited to the conditions in tropical countries and are therefore unrealistic for many of the countries affected. Moreover, many of the users who only speak the local language are usually not able to understand the handling instructions, which are usually written in a European language, or they cannot read them at all.

International responsibility

According to a study by the Fraunhofer Institute in 2002, between 10,000 and 50,000 tons of endosulfan are produced each year in the EU. In the year 2003, in Germany alone, between 250 and 1,000 tons of endosulfan were exported. European and German concerns must therefore also take responsibility for poisonings in Southern countries.



What happens in the body?

The exact mechanism of endosulfan in the body has not been completely researched. However, various studies have shown it to be extremely toxic and that it has a direct effect on the central nervous system.

Many investigations prove that Endosulfan has a damaging effect on the skin, as well as on the mucus membranes of the breathing tract and the eyes. Additional symptoms of poisoning in humans are vomiting, diarrhoea, headaches, dizziness and restlessness which can increase and lead to disorientation and end in cramping attacks. As well as hyperactivity and twitching, symptoms such as breathing difficulties, lack of coordination in movement and lack of balance were observed. For those with a low protein diet, the effects of endosulfan are even more drastic. This is especially the case in many of the poorer countries where many people have to deal with the problem of malnutrition and undernourishment.

Although acute poisoning is the main problem, there are also possibilities of chronic effects on people who were exposed to small doses of endosulfan over a long period of time. Animal studies show that it affects the liver and kidney, as well as unborn foetuses. The animals examined also showed lack of resistance to disease.

Small amounts with great effects

The WHO, in cooperation with the FAO (Food and Agriculture Organisation of the United Nations), lays down the ADI values (Acceptable Daily Intake) for dangerous substances. The ADIs define the maximum amount of a substance which a person could consume on a daily basis during the whole of their life, without it resulting in any damage to their health. For endosulfan the value is 0.006 mg/kg

body weight. An adult weighing 65 kg could therefore consume 0.36 mg of endosulfan a day without endangering themselves. Such a dose, taken over a period of 50 years, would result in the low risk amount of 7.12 g. This is the equivalent of two lumps of sugar. An unbelievably small amount in comparison to the production figures of the active ingredient.

Endosulfan also has an immense effect on the environment. Just small concentrations of endosulfan in water can cause lasting damage to plant and animal life.

Bans and new approvals

Endosulfan is no longer approved as a pesticide due to its toxicity in only four countries worldwide. It is completely banned in Sri Lanka, Norway, Belize and the Netherlands. Another four countries have limited its use. This is also the case in the German Federal Republic. The registration of the active ingredient ran out in West Germany on 26.11.1991, and in the newly-formed German states it didn't run out until 1994 because of an interim arrangement. At present, a revision of older pesticides is being carried out at EU level within the framework of the pesticides authorization Directive 91/414. Endosulfan is already undergoing the reviewing process.

While some countries are trying to get endosulfan banned and others have already succeeded, in other parts of the world it is still used. In some West African countries it was re-approved for the



1999/2000 season and marketed by Aventis, whose agricultural branch has since been taken over by Bayer. Previous to this, the cotton crop had seriously declined as some pests had developed resistance to other pesticide active ingredients. In Senegal, the crop yield fell from 50,576 tons in the 1991/1992 season to 11,623 tons in the years 1998/1999. In the 2000/2001 season altogether 29,331 litres of Endosulfan were sprayed. The re-utilization of endosulfan led to many deaths. OBEPAB (Organisation Béninoise pour la Promotion de l'Agriculture Biologique) registered 37 deaths in the Borgou area in Benin during the 1999/2000 season. Another 36 people suffered serious poisoning. The total number of pesticide accidents was probably much higher. These examples illustrate just how hazardous endosulfan is.

Poisonous maize

On the 24th August, 1999 three youths between the ages of 12 and 14 went to hoe their fathers cotton field. Maize was also grown in the same field as the cotton. The youths did not know that their father had sprayed the field with endosulfan the day before. After work, the boys were hungry and ate a few maize cobs. After 15 minutes they had to vomit. They were taken to the next hospital in Bembereke where one of the boys died.

Endosulfan in West Africa

In January 2001 until July 2003, PAN UK investigated the effects of various pesticide products on humans, in cooperation with PAN Africa, OBEPAB and some smaller African NGOs. This study was carried out in Benin, Mali and in Cameroon. In all three countries most of the pesticides used contained endosulfan. Blood probes were taken from farmers and tested for traces of endosulfan. In the Koutiala region in Mali a total of 28 cases of poisoning were reported. In Fana, Mali, 78 farmers from six villages were questioned. Here there were 19 poisonings. Most of those poisoned were illiterate adults, of whom only a few allowed themselves to be treated in hospital.

The results of the investigation of deaths and poisonings are illustrated in the table on page 1. With 347 poisonings and 53 deaths endosulfan tops the list of hazardous pesticides.



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