

Lives corrupted by agrochemicals

*Rural flower growing communities in Mexico experience abnormally high rates of congenital abnormalities, spontaneous abortions, and stillbirths. While official explanations point to the close blood relationships and a lack of folic acid in the diet, some clinicians and researchers are concerned about the liberal use of highly toxic pesticides by small-scale flower growers. **Neus Rafols** investigates.*

Freddie Guadarrama, born in Villa Guerrero, a flower growing municipality in the centre of Mexico, is only 10 years old but has already undergone eight operations in his short life. He was born with a malformation of the neural tube, myelomeningocele. Juanito Diaz Reyes, also from Villa Guerrero, is seven years old and suffers from hydrocephalus, another neural tube defect. Their parents, like one-third of Villa Guerrero's residents, are small-scale flower growers.

Freddie and Juanito's cases are not isolated. A private medical centre in Tenancingo (Centre for Psychopedagogical Attention to Children and the Family) has recorded at least 800 cases of congenital abnormalities in the neighbouring municipalities of Tenancingo and Villa Guerrero. 'All along this corridor of floriculture we find health problems due to congenital malformations, spontaneous abortion and stillbirth', explains Dr Alfonso Guadarrama Rosales, a surgeon and director of the centre, who believes the problem may be related to agrochemical use.

In 1999 Dr. Julieta Castillo, a chemist from the Mexican State Autonomous University (UAEM), started investigating. She discovered that four times more children were born with congenital malformations at the Tenancingo General Hospital (21%, or 169 out of 802) than at the gynaeco-obstetric hospital of Toluca, the capital of Mexico State (5.6%, or 285 out of 5,064). Such malformations may be caused by a number of factors such as close family relations, lifestyle habits and diet. However, many flower growers, particularly small-scale growers, use highly hazardous pesticides, such as methamidophos, monocrotophos (WHO Class 1b) and extremely hazardous pesticides, such as aldicarb (WHO Class 1a). Although these pesticides have been prohibited in many Northern countries and in Mexico, some agrochemical companies in Mexico are able to sell them more cheaply than the authorised pesticides. Their low price and high toxicity (which means they kill pests rapidly) means that many small-scale flower growers still use them. The high incidence of congenital malformations within flower growing communities suggested to Dr. Castillo that the use of such pesticides might be a contributing factor.

Studies point to pesticides

Nuestra Senora de la Paz University in

Bolivia published field studies from flower producing zones. Examination of clinical records of subjects living in the flower producing zones and attending Tiquipaya Hospital and San Jose Obrero Medical Centre showed a high prevalence of spontaneous abortion. The researchers noted that while spontaneous abortions may be caused by factors other than exposure to pesticides, there was cause for concern and called attention to the fact that flower growers who used large quantities of teratogenic pesticides, showed rates of abortion 47% and 126% higher (different rates noted at each centre) than was seen in the non-exposed population. Colombian and Chilean studies¹ have also shown an increase in spontaneous abortions and stillbirths in flower growing populations related to the effect of pesticides.

Pregnant women spraying

The results of these published studies coincide with the observations of Dr Guadarrama: 'we have recorded more frequent abortions than even the congenital malformations. Pregnant women in Tenancingo, Villa Guerrero and Santa Ana lose their babies not due to viral infections but from exposure during pregnancy to agrochemicals. The incidence of still births is also high.' Out of economic necessity many women in these municipalities continue to spray pesticides even when they are pregnant. Maria del Carmen Martinez Bernal who has worked in floriculture for 15 years has a three-year old daughter who has been affected. 'For a while I deadheaded flowers, and sprayed and pruned plants. When I got pregnant I carried on working. My husband grew his own plants and I also helped him. Here nobody uses a mask when spraying, not even children or pregnant women,' she commented.

Economic influences

Historically flowers produced in Tenancingo and Villa Guerrero were destined for the domestic market but in the 1990s with the free-trade agreement these two municipalities began to produce flowers for export, mainly to the US. The Mexican federal government encouraged floriculture through national bank credits and a special export programme aiming to increase Mexico's market share. This economic imperative may explain the lack of

vigilance among the responsible authorities regarding agrochemical use. It may also explain the impunity under which the agrochemical industries, the majority of which are transnationals, are allowed to commercialise pesticides prohibited in Northern countries.

The official version

According to Maria Concepcion Alvarez Arratia (co-ordinator of the State Genetics Programme at the Mexican Institute of Social Security), the main causes of the congenital malformations detected in Tenancingo are likely to be close blood relationships between parents and the lack of folic acid (vitamin B12) in the diet of pregnant mothers. 'If women take folic acid before pregnancy this probability decreases greatly,' explains Alvarez Arratia. She cites a number of studies linking such defects with folic acid deficiency and genetic similarity and points to a programme set up 25 years ago in Ireland to educate pregnant mothers about the need for folic acid which successfully decreased the rate of congenital abnormalities.

Still Dr Castillo returns to her former hypothesis: 'If we talk about lack of folic acid we're talking about malformations of the neural tube. But harelip, genital ambiguity and extra numbers of fingers or nipples has nothing to do with lack of folic acid ... in Tenancingo hospital, a high percentage of malformed newborn babies had other congenital malformations, not just those related to the neural tube, which could undermine the folic acid hypothesis.' Neither can Dr Maria Elisa Zamudio Abrego, director of the Centre for Rehabilitation and Special Education in Mexico State disregard the possibility that agrochemicals play a role. 'Use of agrochemicals could be one of the causes since these malformations are multifactorial ... When I worked as a general practitioner in Tuxpan, a campesino community dedicated to growing tobacco and maize, I observed that there were many congenital malformations. At that time, I attributed it to the fact that the inhabitants continually handled agrochemicals. I also observed ... many abortions and stillbirths.'

Although the impact of agrochemicals on human health remains a matter for debate, amongst the inhabitants of these two municipalities, the uncertainty over pesticides has turned into a shared fear: that of creating more lives plagued by malformation and death. Flower growers are looking in the mirror and doubting the happiness their flowers bring.

1. Restrepo M, Munoz N, Day NE, Parra JE, de Romero L, Nguyen-Dinh X, Prevalence of adverse reproductive outcomes in a population occupationally exposed to pesticides in Colombia. Scandinavian Journal of Work Environment and Health. 1990;16:232-8.

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