

# **Paraquat/Gramoxone use and abuse in Trinidad & Tobago**

**Prepared by Nipaul Gangeram, Pesticides and Toxic Chemicals Inspector II(Ag.)**

In Trinidad & Tobago, Paraquat is referred to as Gramoxone, however there are other trade names of this products registered that has Paraquat as its active ingredient such as Sunquat, Pilarxone, Weedless, Raze, Gramoxone Super and Wopro Paraquat. Paraquat is a contact non-selective herbicide (weed killer) that has been used by farmers locally for over 20 years to control a very wide range of broad leaved weeds and grasses in agricultural crops and otherwise, it can also be used as a defoliant. The main manufacturer of paraquat is Syngenta, which (as ICI) developed the active ingredient Paraquat Dichloride in the early 1960's. Syngenta remains the major producer, with its products accounting for at least 50% of the market. Paraquat no longer has patent protection and as such is produced by a number of manufacturers worldwide.

Paraquat was first submitted for registration in Trinidad and Tobago as Gramoxone Super by Geo F. Huggins & Co Ltd in 1989 with manufacturers being ICI Agrochemicals of the UK. The Pesticides and Toxic Chemical Act and Regulations of Trinidad and Tobago has included additional requirements for its registration in that the product must be stented and an emetic must be added to its ingredients before it could be registered. Premises licensed for the sale of paraquat must also have facilities for the keeping of a register of the sales and purchases; this would entail the agro shop owner getting basic information from the intended buyer of this product. Class 1 pesticides such as this must also be displayed in a secured place on the premises in that the general public must not have free access.

Paraquat is used locally by both farmers and the average householder since there is no legislation governing the usage of pesticides in Trinidad & Tobago. Sustainable agriculture is essential for our survival, especially given our rapidly increasing population. Hence the use of herbicides has become very important in maintaining and increasing agricultural production. The users of this product are convinced that the instant reaction obtained after spraying is testimony to the product's potency and effectiveness.

## **Benefits**

Paraquat is an important tool for weed management. It controls many species of weeds and can be used with most crops. Paraquat acts fast in all seasons, no matter what the weather conditions are and is rain fast in 15 - 30 minutes. Once sprayed, paraquat kills the weeds and then becomes inactive in the soil.

## **Safety when using Paraquat**

- Avoid all contact when handling

## **How you could be exposed to paraquat**

- The most likely route of exposure to paraquat that would lead to poisoning is ingestion (swallowing). The suicide rate in Trinidad and Tobago is much greater than that of its English-speaking Caribbean neighbors. Many of these suicides are paraquat induced. Research conducted

reviewed the deaths due to suicide in the area with the greatest agricultural activity in Trinidad and identified paraquat as the chemical ingested as the agent of these suicides. Of 48 cases of suicide for the year, 39 (81.3%) were due to paraquat poisoning. Individuals of East Indian origin accounted for 89% of the suicide victims. When compared with suicide by other methods in the country, these findings confirm that paraquat poisoning is a significant means of suicide in Trinidad and that young East Indian individuals are particularly vulnerable.

- Eating or drinking paraquat-contaminated food or beverages is also possible. Paraquat can be easily mixed with food, water, or other beverages.
- Paraquat poisoning is also possible by skin exposure especially if the skin has sores, cuts, or severe rash.
- If inhaled, paraquat could cause poisoning leading to lung damage. Farmers and other frequent users of paraquat are the people most at risk for this type exposure.

### **How paraquat works**

- Paraquat causes direct damage when it comes into contact with the lining of the mouth, stomach, or intestines. The extent of poisoning caused depends on the amount, route, and duration of exposure and the person's condition of health at the time of the exposure.
- After paraquat enters the body, it is distributed to all areas of the body. Toxic chemical reactions occur throughout many parts of the body, primarily the lungs, liver, and kidneys. A teaspoon of paraquat concentrate can cause death. Paraquat is corrosive to the skin and is easily absorbed once the skin is damaged.

### **Immediate signs and symptoms of paraquat exposure**

- After a person ingests a large amount of paraquat, he or she is likely to immediately have pain and swelling of the mouth and throat. The next signs of illness following ingestion are gastrointestinal (digestive tract) symptoms, such as nausea, vomiting, abdominal pain, and diarrhea (which may become bloody).
- Severe gastrointestinal symptoms may result in dehydration (not enough fluids in the body), electrolyte abnormalities (not enough sodium and potassium in the body), and low blood pressure.
- Ingestion of small to medium amounts of paraquat may lead to development of the following adverse health effects within several days to several weeks:
  - Liver failure
  - Kidney failure
  - Heart failure
  - Lung scarring (may evolve over several weeks)
- In general, ingestion of large amounts of paraquat leads to the following signs/symptoms within a few hours to a few days:
  - Pulmonary edema (fluid in the lungs)
  - Lung scarring (evolves more quickly than when small to medium amounts have been ingested)
  - Liver failure
  - Kidney failure
  - Confusion
  - Coma
  - Seizures
  - Injury to the heart
  - Fast heart rate
  - Muscle weakness

- Respiratory (breathing) failure, possibly leading to death
- Showing these signs and symptoms does not necessarily mean that a person has been exposed to paraquat.

### **What the long-term health effects are**

- If a person survives the toxic effects of paraquat poisoning, long-term lung damage (scarring) is highly likely. Other long-term effects may also occur, including kidney failure, heart failure, and esophageal strictures (scarring of the swallowing tube that makes it hard for a person to swallow).
- People with high-dose exposure to paraquat are not likely to survive.

### **How you can protect yourself, and what you should do if you are exposed to paraquat**

- Since ingestion is likely to be the primary route of exposure, if poisoning is suspected, avoid any further ingestion and call 811 immediately.
- Inducing vomiting (giving ipecac) is unlikely to be of any benefit unless done within a few minutes of ingestion. Activated charcoal should be ingested if it is available. Ingestion of food (or even plain dirt) may be of some benefit if charcoal is not readily available.
- If you think you may have been exposed to liquid paraquat on your clothes or body, remove your clothing, rapidly wash your entire body with soap and water, and get medical care as quickly as possible.
- **Removing your clothing:**
  - Quickly take off clothing that has liquid paraquat on it. Any clothing that has to be pulled over the head should be cut off the body instead of pulled over the head.
  - If you are helping other people remove their clothing, try to avoid touching any contaminated areas, and remove the clothing as quickly as possible.
- **Washing yourself:**
  - As quickly as possible, wash any liquid paraquat from your skin with large amounts of soap and water. Washing with soap and water will help protect people from any chemicals on their bodies.
  - If your eyes are burning or your vision is blurred, rinse your eyes with plain water for 10 to 15 minutes. If you wear contacts, remove them and put them with the contaminated clothing. Do not put the contacts back in your eyes (even if they are not disposable contacts). If you wear eyeglasses, wash them with soap and water. You can put your eyeglasses back on after you wash them.
- **Disposing of your clothes:**
  - After you have washed yourself, place your clothing inside a plastic bag. Avoid touching contaminated areas of the clothing. If you can't avoid touching contaminated areas, or you aren't sure where the contaminated areas are, wear rubber gloves or put the clothing in the bag using tongs, tool handles, sticks, or similar objects. Anything that touches the contaminated clothing should also be placed in the bag. If you wear contacts, put them in the plastic bag, too.
  - Seal the bag, and then seal that bag inside another plastic bag. Disposing of your clothing in this way will help protect you and other people from any chemicals that might be on your clothes.
  - When the local or state health department or emergency personnel arrive, tell them what you did with your clothes. The health department or emergency personnel will arrange for further disposal. Do not handle the plastic bags yourself.
  - For more information about cleaning your body and disposing of your clothes after a chemical release, see "Chemical Agents: Facts About Personal Cleaning and Disposal of Contaminated Clothing".

- Seek medical attention right away. Dial 911 and explain what has happened.

### **How paraquat exposure is treated**

Treatment consists of removing the paraquat from the body (decontamination) and providing supportive medical care in a hospital setting. Supportive care includes intravenous fluids (fluids given through a needle inserted directly into a vein), medications to help with breathing and to raise low blood pressure, a ventilator to support breathing, and possibly dialysis for kidney failure (artificial kidneys). No proven antidote or cure exists for paraquat poisoning.

### **Paraquat and the environment**

Paraquat binds strongly to soil particles and tends to remain strongly bound for a long time in an inactive state, although it can also desorb again and become biologically active. The half-life in soil can be up to 20 years. In water it is absorbed with a half-life between 2 and 820 years depending on sunlight and depth of water. It has been found in surface waters, drinking water, and in groundwater although it is generally believed to be immobile in the soil and not to leach to groundwater.

It is extremely biologically active and toxic to plants and animals. Moderately toxic to birds, toxic to some soil fungi and bacteria, and increases populations of some soil pathogens. Freshly sprayed foliage can kill livestock.