



# **GUIDE TO**

# **Safe and Effective Use**

## **OF CHEMICALS FOR CROP PRODUCTION**

The Feed the Future Innovation Lab for Small Scale Irrigation (ILSSI) is a research-for-development project led by the Norman Borlaug Institute for International Agriculture at Texas A&M University. The project aims to contribute

to an increase of profitable, sustainable and gender-sensitive irrigation to support inclusive agricultural growth, resilient food systems, and nutrition and health outcomes, particularly for vulnerable populations.

**FEED THE FUTURE INNOVATION LAB FOR  
SMALL SCALE IRRIGATION**

THE MAIN GOAL

# Grow Healthy Crops

Careful selection of chemicals avoids waste, saves money, and grows healthy crops.







**BEFORE APPLICATION**

# Get Good Advice

**Use chemicals only when needed.**

**Before buying chemicals, get advice from authorized retailers, or your extension officer.**





**WHEN YOU PURCHASE CHEMICALS**

# **Buy Genuine Chemicals**

**Buy from registered, known, certified agrodealers and distributors.**

**Counterfeit chemicals will not work well and are a waste of money.**





**WHEN YOU PURCHASE CHEMICALS**

# Buy Labeled Chemicals

**Do not buy or use chemicals that are not in their original packaging.**

**You may not be buying a genuine product. It might not work, and it could be dangerous to human, animal, and plant health.**





**WHEN YOU PURCHASE CHEMICALS**

# **Keep Seller Contacts**

**Keep the seller's contact  
information.**

**If accidents happen, sellers  
can provide information  
that will save lives.**





**WHEN YOU PURCHASE CHEMICALS**

# **Do Not Buy Extra**

**Buy only the amount you need.**

**It is better not to store or dispose of extra unused chemicals.**





**WHEN YOU PURCHASE CHEMICALS**

# **Buy Fresh Chemicals**

**Do not buy expired products.**

**They may not be effective or may have become dangerous.**





**WHEN YOU PURCHASE CHEMICALS**

## **Buy Sealed Packages**

**Do not buy packets, bottles, or containers that are broken or have holes. Instead, buy chemicals that are sealed in their original packaging.**

**Unsealed chemicals may spill near people or animals and cause poisoning.**





**KEEP LABELS ON FOR SAFETY**

# **Never Remove the Labels**

**Store agricultural chemicals  
in original packages with  
original labels and information.**

**The labels are essential  
for proper use or in case  
someone is poisoned.**





**AFTER YOU PURCHASE CHEMICALS**

# **Store Correctly**

**Follow storage instructions  
according to the sales agent  
or package directions.**

**Correct storage avoids  
waste, saves money, and  
reduces risk of poisoning.**





**BEFORE YOU USE CHEMICALS**

# **Store Carefully**

**Store chemicals in a  
locked and well-ventilated  
room or cupboard.**

**This will help keep children  
and animals safe.**

**If you do not have a secure  
place, store chemicals  
up high, out of reach.**





**BEFORE YOU USE CHEMICALS**

# **Store Safely**

**Keep all chemicals away from the food, drinks, and fire.**

**Chemicals can poison your food and drinks.**

**Some chemicals catch fire easily.**





**STORE CHEMICALS SAFELY**

# **Store In Cool Dry Place**

**Store chemicals away  
from heat and water.**

**Heat and water may cause  
them to become dangerous.**



**STORE CHEMICALS SAFELY**

# Use Original Container

**Do not put chemicals in food and drink containers.**

**If the container looks appealing, or looks like food or drink, the chemicals may poison children or others.**







**WEAR PROTECTIVE CLOTHING**

## **Gear Up Before Mixing**

**Put on protective clothing  
before opening chemicals  
and while you mix them.**

**Continue to wear  
protective clothing during  
application and until you  
have finished cleanup.**

**Do this to protect  
your health and avoid  
accidental poisoning.**





**WEAR PROTECTIVE CLOTHING**

## **Wear Correct Clothing**

**Wear a long-sleeved shirt, long pants, boots or full shoes (waterproof is best), long socks, waterproof gloves, goggles or spectacles, a plastic apron, a nose mask, and overalls.**

**Also, to protect your head and face, men should wear a hat, and women should wear their hair back with a scarf or hat.**





**WEAR PROTECTIVE CLOTHING**

# **Check your Clothing**

**Check protective clothing for any holes before use.**

**Replace damaged gear to avoid accidental contamination.**





**STORE GEAR CORRECTLY**

# Keep Your Protective Clothing Separate

Use your protective clothing **ONLY** for chemical mixing, application, and cleanup.

Store your protective clothing separately from other clothes.





**MIX CHEMICALS CAREFULLY**

# **Follow Mixing Instructions**

**Carefully follow the mixing instructions according to the sales agent or package directions.**

**Correct mixing avoids waste, saves money, reduces risk of poisoning, and grows healthy crops.**





**MIX CHEMICALS CAREFULLY**

## **Do Not Mix At Home**

**Always mix chemicals at the time and place you are prepared to use them, never at the house or compound.**

**Keep chemicals away from your family to reduce their risk of poisoning.**





**MIX CHEMICALS CAREFULLY**

# Open Carefully

**Use a tool, such as a knife or scissors, to carefully open the chemical container.**

**Open packaging carefully to avoid spills or poisoning.**





**MIX CHEMICALS CAREFULLY**

# **Never Bite Packaging**

**Do not use your teeth to open  
a package of chemicals.**

**Even small amounts of  
chemicals can make you sick.**





**MIX CHEMICALS CAREFULLY**

# Rinse Carefully

**After mixing, TRIPLE-RINSE the empty chemical container into the spray tank.**

**Careful rinsing will help you save money and avoid wasting any of the chemicals.**





**MIX CHEMICALS CAREFULLY**

# **Never Taste Chemicals**

**Never put chemicals or spray in your mouth.**

**Tasting chemicals is not a safe or reliable way to test if the chemical mix is strong.**

**Even if you spit the chemical out after tasting, you will still be poisoned.**





**DO NOT WASTE CHEMICALS**

# **Calibrate Your Equipment**

**Check your sprayer  
regularly for leaks.**

**Ensure that the nozzle  
is working correctly.**

**Correct application avoids  
waste, saves money, and  
grows healthy crops.**





**DO NOT WASTE CHEMICALS**

# **Use Proper Equipment**

**Use proper equipment when applying chemicals.**

**Makeshift gear is wasteful and dangerous.**





**GET BETTER RESULTS**

# Apply Correctly

**Follow application instructions  
according to the sales agent  
or package directions.**

**Correct application avoids  
waste, saves money,  
reduces risk of poisoning,  
and grows healthy crops.**





**GET BETTER RESULTS**

# **Do Not Spray Mid-day**

**Spray early in the morning  
or late in the evening when  
it is cooler and less windy.**

**It will be easier to get more  
of the chemicals where they  
are useful, saving you time  
and money as well as reducing  
dangerous over-spray.**





**AVOID ACCIDENTAL POISONING**

# **Keep Your Hands Away from Your Mouth**

**Do not eat, drink, smoke, or chew tobacco while spraying.**

**You may poison yourself by accidentally transferring chemicals from your hands to your mouth.**





**AVOID ACCIDENTAL POISONING**

# **Do Not Spray Near Water**

**Do not spray chemicals near water sources.**

**Chemicals will poison the water supply and anyone who touches the water.**





**CLEANUP STEP 1**

# Clean Your Equipment

**Before removing your protective clothing, wash the spray equipment.**

**Wash equipment well away from rivers and streams.**



# Remove Your Gear

After you have finished using chemicals and cleaning your equipment, carefully take off your protective clothing and gear.





# Clean Yourself

Wash your entire body well with soap and water.

Wash your hands, head, and feet, especially thoroughly.





# Safely Dispose of Wash Water

**Do not pour wash water on the soil near a well or dugout or a green area. Instead, dump it in a dry place away from your home, livestock, and water sources.**

**Correct wash water disposal reduces the risk of poisoning livestock and people.**





# Wash Your Protective Clothing Separately

Wash, dry, and store protective clothing separately from your other laundry.

**ONLY** use your protective clothing for chemical mixing, application, and cleanup.







**AVOID ACCIDENTAL POISONING**

# **Clean Up First**

**Do not eat, drink, smoke, or  
chew tobacco until you are  
entirely done cleaning up.**

**You may poison yourself by  
accidentally transferring  
chemicals from your  
hands to your mouth.**





**AVOID ACCIDENTAL POISONING**

# Throw Away Disposables

**Do not reuse single-use items.**

**Properly dispose of your  
nose mask, rubber gloves,  
broken equipment, and  
any other contaminated  
single-use items.**





**HANDLE CONTAINERS SAFELY**

# **Puncture Used Containers**

**After cleanup, puncture all empty chemical containers before disposal so that they cannot be used for water or food storage.**





**HANDLE CONTAINERS SAFELY**

# Dispose of Containers

**Never leave empty chemical containers in the field.**

**Do not put empty chemical containers in the rubbish.**

**You must not burn or bury empty containers.**





**HANDLE CONTAINERS SAFELY**

# Collect Containers

**Put all empty chemical containers in a heavy sack until you can return them to the sales agent, project leader, or FAO collection point.**





**HANDLE CONTAINERS SAFELY**

# **Never Reuse Containers**

**Dispose of empty chemical containers properly to keep yourself, your family, neighbors, and animals safe.**

**It is important that no one uses empty chemical containers for food, drinks, kerosene, or livestock.**





**HANDLE CONTAINERS SAFELY**

# Return Containers

**Return all used original chemical containers to the sales agent, project leader, or FAO collection point.**

**NEVER remove labels from chemical containers.**



# Rinse Skin Immediately

If you get chemicals on your skin, immediately wash the poison away with water and check the label for first aid instructions.





# Get Prompt Medical Help

If you think you may have been exposed or poisoned, do not wait. Seek medical help immediately.

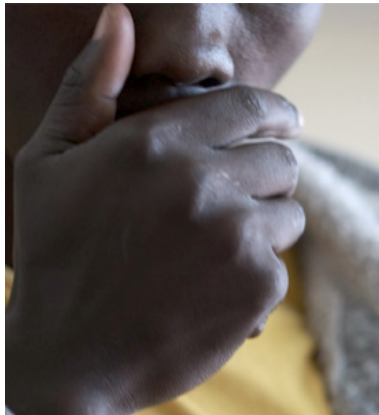
Bring the product label with you. A doctor or nurse will need the information on the label to provide proper medical care.







**Skin rash,  
burning, or  
other irritation**



**Painful  
breathing,  
coughing,  
sneezing, or  
catarrh**



**Fever, head pain,  
or dizziness**



**Eyes and nose  
burning**



**Painful sores**



**Vomiting, loss  
of appetite, or  
stomach pain**

**FIRST AID**

# Symptoms of Poisoning

**Watch for signs of  
exposure to chemicals.**

**If you think you may have  
been exposed or poisoned,  
do not wait. Seek medical  
help immediately.**

**Take the product  
label with you.**





**GENERAL WARNING**

Symbol widely used to warn of danger, hazard, and the unexpected.



**GENERAL POISON**

European Union Standard Toxic Substance Symbol

# Warning Labels

Watch for these and other warning labels that show the danger level and tell you how careful you need to be.

Chemicals are classified into systems created by governments and international organizations. But since there is no global system, the symbols can vary.

Class I-a



**EXTREMELY TOXIC**

Corrosive and Lethal

Class I-b



**HIGHLY TOXIC**

Severe Irritant

Class II



**MODERATELY TOXIC**

Moderate Irritant

Class III



**SLIGHTLY TOXIC**

Mild or Slight Irritant





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FROM THE AMERICAN PEOPLE



**FEED THE FUTURE**

The U.S. Government's Global Hunger & Food Security Initiative

TEXAS A&M  
**AGRILIFE**  
EXTENSION



THE TEXAS A&M  
UNIVERSITY SYSTEM



This publication was partly made possible through support provided by Feed the Future Innovation Lab for Small Scale Irrigation through the U.S. Agency for International Development, under the terms of Contract No. AID-OAA-A-13-00055.

The contents herein are those of the authors and do not necessarily reflect the views of the U.S. Agency for International Development.

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