



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.

FIRST AID

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.



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.



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



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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