

# Illustrative Guide to Sugarcane Farming



SOUTH AFRICAN SUGARCANE  
RESEARCH INSTITUTE

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# PLANTING

## Site Selection

- If virgin land, a permit is required
- Slope should be less than 20%
- Soil potential (soil form & depth)
- A Land Use Plan (LUP) is recommended



Checking the soil type and depth



Plough out field



# PLANTING

## Land Preparation

The purpose of good land preparation is to:

### 1. Kill the old crop

- If yield has become too low
- To control diseases
- To change the variety



### 2. Prepare a seed bed

- With no clods
- Remove the old stools
- With no volunteers
- To create a furrow in which to plant (100 mm)





# PLANTING

## Methods of land preparation

### Minimum tillage

Equipment needed: tractor, rotary hoe and knapsack sprayer

- Glyphosate is used to kill the old crop
- Reduces soil erosion
- Recommended for steep land:  $>12\%$
- Recommended for sandy soils
- Used in summer November - March
- Lower costs



Old crop

Interrow

### Conventional tillage

Equipment needed: tractor, plough and harrow

- Can only be done in Winter  
eg. April - September
- Lime can be incorporated
- Not suitable for steep land
- Higher costs



# PLANTING

## Row Spacing and Depth

### Row Spacing

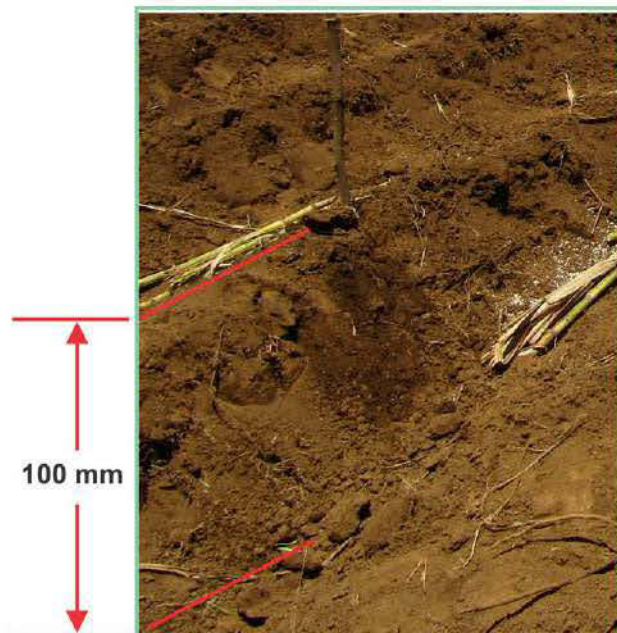
- Depends on your soil type and location
- Common row spacing = 1m or 1,2 m



Row spacing

### Row Depth

- 100mm optimum



Planting depth



# PLANTING

## Seedcane

### Variety selection

Based on:

- Harvest cycle: 12 or 24 month?
- Soil type
- Aspect and elevation
- Time of year of harvest
- Distance from mill



Seedcane harvesting

### Seedcane quality

- Disease and pest-free seedcane
- Age of seedcane (9 - 18 months)
- Source seedcane two years ahead of planting





# PLANTING

## Method

### Application of fertiliser

- Apply plant fertiliser in the furrow
- Topdress  $\pm$  12 weeks later



### Seed Cane Rate

- 6 Tons - Single Stick
- 8 Tons - 1½ Stick
- 10 Tons - Double Stick



### Set Length

- Cut 3 - 4 internodes
- RSD control - 5 litres of water per 500ml of Jeyes Fluid

### Covering Depth

- Winter (shallow) - 50 mm
- Summer (deep) - 100 mm
- Compaction is vital
- Weed control using a pre-emergent herbicide immediately after planting





# Fertiliser

## What is fertiliser?

An organically or chemically manufactured compound that when applied supplies the nutrient requirements of the crop to stimulate growth.



## Why do we need to fertilise?

To provide plant nutrients to increase yields and profits.





# Fertiliser

## Types of fertiliser

### Organic:

Animal or composted manure

Contains variable amounts of nutrients

### Inorganic fertiliser:

Granular or liquid compound that contain exact quantities of plant nutrients



## Plant Nutrition

N - Nitrogen - Leaves

P - Phosphorous - Roots

K - Potassium - Stalk



N

P



K





# Fertiliser

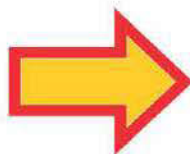
## Step by step procedure

Take a soil sample and submit to laboratory



1

Read the results of the soil sample



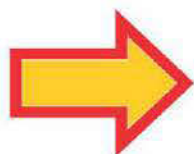
2

Buy the recommended fertiliser



3

Lime may also be required





# Fertiliser

## When to apply fertiliser?

At planting -  
in furrow



Topdressing  
after planting



Topdressing  
after harvesting





# Fertiliser

## How to apply fertiliser?



**Tin & String**



**Fertiliser applicator**



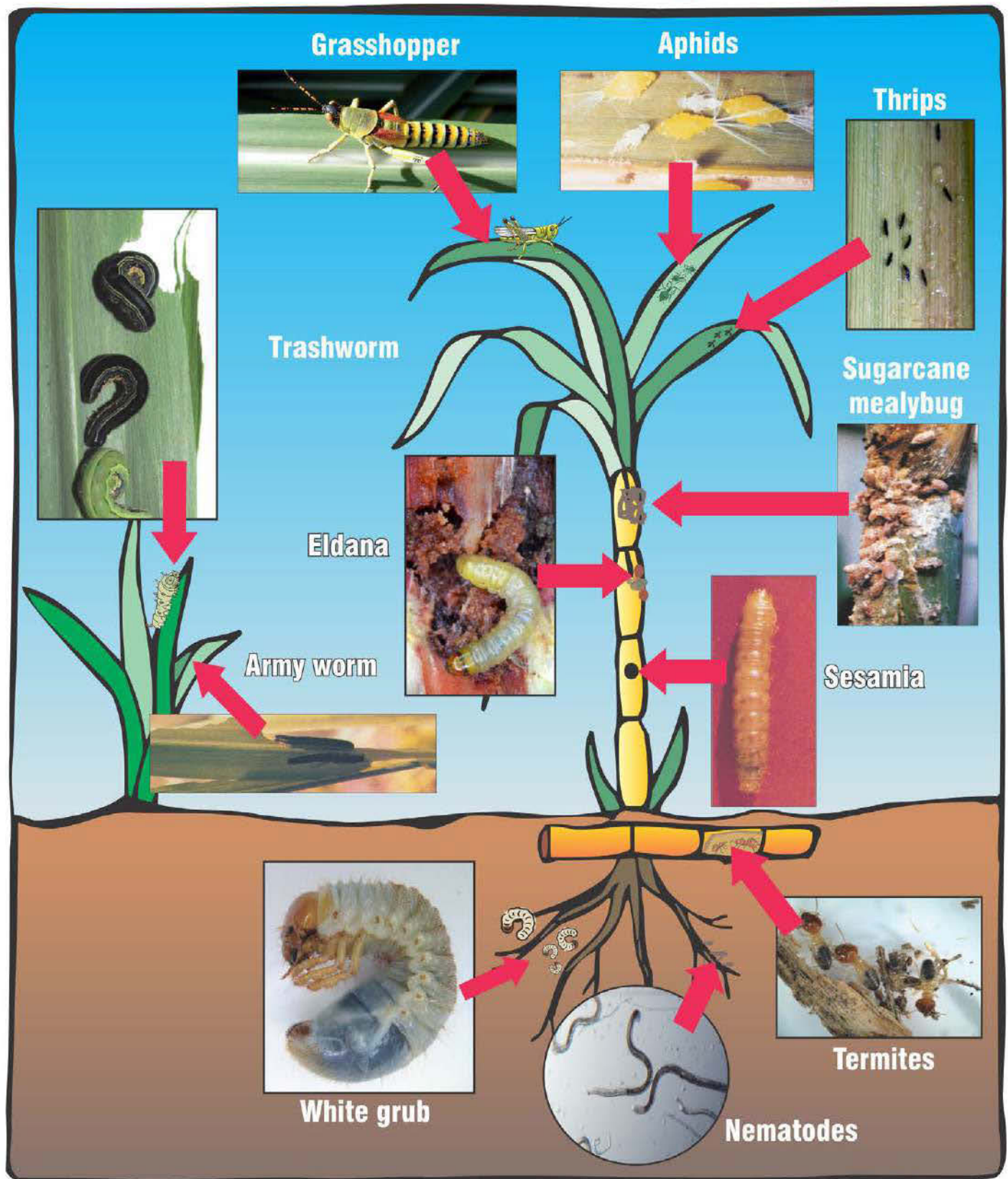
# Fertiliser

## Fertilising tips

- Always use **FAS** recommended rates and types of fertiliser.
- **In summer**- apply fertiliser after harvest.
- **In winter** - apply fertiliser after the first spring rain.
- **On clay soils** - apply fertiliser as a narrow band over the row.
- **On sandy soils** - apply fertiliser as a wider band over the row and interrow.
- **On sandy soil** - split the nitrogen application.
  - 1/2 at planting
  - 1/2 8-weeks later
- **N recommendations can be reduced by 20 to 30 kg/ha**
  - On shallow soils
  - During a drought
  - If eldana is a serious problem

# Pests of Sugarcane

Several insect pests damage sugarcane





# Pests of Sugarcane

## Eldana Borer

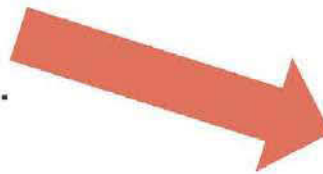
### Eldana is found:

- Predominantly in warmer, coastal areas.
- In cane of all ages, at any time.
- In stressed cane.



### Damage caused:

- Bores into cane stalks.
- Can destroy the entire crop.



### What to do:

- Inspect cane to be carried over.
  - Immediately mill infested cane.
  - Pre-trashing can be done.
- 
- Cut cane as young as possible.
  - Only apply recommended rates of Nitrogen.
  - Do not carry over old or stressed cane.
  - Plant less susceptible cane varieties.
  - Plant only inspected seed cane.





# Pests of Sugarcane

## Sesamia Borer

- A sugarcane borer similar to Eldana.
- Does less damage than Eldana.



## Differences between Eldana & Sesamia:

- Eldana is more active than Sesamia.
- Eldana wriggles more vigorously than Sesamia when touched.
- Eldana moves backwards when touched on the head.
- Eldana often has a silk thread, Sesamia does not.
- Eldana is dark grey in colour, Sesamia is pink.
- Eldana bores lower down stalk. Sesamia bores towards top of stalk



# Pests of Sugarcane

## Trash Caterpillar

### Trash Caterpillar is found:

- Usually in trashed fields
- During the cutting season (May - Nov)
- At night feeding on the leaves of young cane.
- During the day under the trash blanket.

### Damage caused:

- Yield losses up to 17tc/ha can occur with a severe infestation.
- The crop will recover.

### Control:

- Natural control - fungi, parasitic flies and wasps, birds, ants, spiders.
- Use of Insecticides **IS NOT RECOMMENDED**

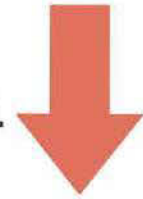




# Pests of Sugarcane

## Sugarcane Thrips

- ▶ Minute insects with slender bodies and fringed wings.
- ▶ Adults dark brown to black, (1mm long).
- ▶ Nymphs colourless to yellow with red eyes.



## Sugarcane thrips is found:

- ▶ Within leaf spindles.
- ▶ Found by unrolling spindle leaves.
- ▶ Year round, most common from Oct to March

## Damage caused:

- ▶ Feeds on sugarcane leaves.
- ▶ Leaf-tips tied together and later become dry and twisted.
- ▶ Causes yellow to white patches on open leaves.



## Control:

- ▶ Apply systemic insecticides at planting.
- ▶ In ratoon crops, apply foliar insecticides.
- ▶ Avoid planting late season crops.

# Pests of Sugarcane

## White Grub

“Comma - shaped”, whitish-grey grub.



### White Grub is found:

- ▶ Around the roots of sugarcane plants.
- ▶ February to August.



### Damage caused:

- ▶ Feeds on sugarcane roots.
- ▶ Poor growth and the yellowing of leaves when large numbers are present.



### Control:

- ▶ Control is difficult.
- ▶ Natural control (fungi and soil predators) is unreliable.
- ▶ Contact insecticides need to reach the pest  
- difficult in ratoon crops.
- ▶ Insecticides **ARE NOT RECOMMENDED.**



# Pests of Sugarcane

## Termites

- Do not normally harm cane.
- Damage is normally to newly planted cane setts, during dry weather and in sandy soils when termites look for moisture.

### Control:

- No economical control available.
- Onset of rain helps.

### What to do?

- Replant (gap fill) affected areas.



## Nematodes

- Are tiny worms that feed on the roots of sugarcane
- Cannot be seen with the naked eye
- Damage most severe in sandy soils

### Above ground symptoms

- Uneven and stunted growth, poor tillering, spikey leaves.

### Below ground symptoms

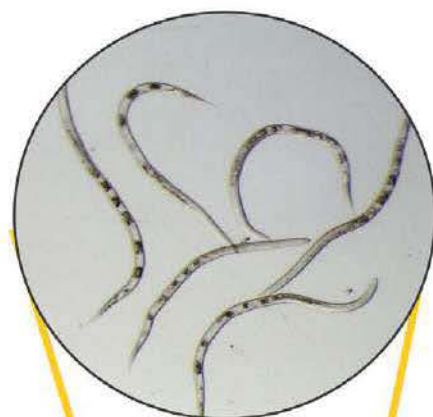
- Short, stubby roots
- Swellings/galls may be present but not always visible

### What to do?

- Send soil and root sample to lab for analyses to confirm presence of damaging nematodes

### Control

- Soils with <6% clay: Use a nematicide
- Soils with >6% clay: First assess use of nematicide by using test strips
- Use tolerant varieties
- Choose green manure crops carefully, some decrease nematode numbers e.g. oats
- Encase sett at planting with kraal manure/filter cake to provide physical barrier





# Diseases of Sugarcane

The major diseases of sugarcane are:

## 1. Ratoon Stunting Disease (RSD)



## 2. Mosaic



## 3. Smut



# Diseases of Sugarcane

## Ratoon Stunting Disease

- **RSD is found in all areas**
- **No variety is immune**
- **All SA varieties can get RSD**

### What does RSD do?

- Nearly half your yield can be lost
- Losses are greater if the cane is stressed

### Symptoms

- Stunted sugarcane stools (short, thin stalks)
- Fields look uneven
- Not easy to see



### How is RSD spread?

- Infected seedcane
- Cane knives at harvest
- Infected volunteers



### Control

- Healthy, hot-water treated seedcane
- Test seedcane for RSD
- Dip cane knives regularly in a 10% solution of Jeyes fluid
- Remove volunteer plants



# Diseases of Sugarcane

## Mosaic

- Mosaic is found mainly in the cooler high altitude areas but can occur in all areas
- Many new varieties are resistant

### What does mosaic do?

- Causes loss of cane yield

### Symptoms

- Plants have a yellow-green colour
- Infected leaves show small streaks of dark green (Easiest to see at the base of young leaves).



### How is mosaic spread?

- Infected seedcane
- By aphids (insects) - particularly the maize aphid



### Control

- Resistant varieties
- Disease-free seedcane
- Control weeds and other grasses (these serve as hosts for the virus)
- Observe local LPD&VCC restrictions



# Diseases of Sugarcane

## Smut

- Smut is found mainly in the northern irrigated areas and Zululand.

### What does Smut do?

- Causes yield losses
- Losses increase with each ratoon
- Losses can be as high as 75% in poorly grown stressed cane
- Some varieties are more susceptible



### Symptoms

- Early - elongation of the stem
- Late - formation of a black whip
- Badly affected stools become grass-like and unmillable



Whip



Badly affected stool

### How is Smut spread?

- Infected seedcane
- Wind blown spores
- Planting healthy seedcane in contaminated soil

### Control

- Smut resistant varieties
- Healthy, disease-free seedcane
- Rogue out infected stools →
- Plough-out severely infected fields
- Remove volunteer plants
- Avoid stress conditions





# Diseases of Sugarcane

## Other common diseases



Pineapple Disease



Red Rot



Pokkah Boeng



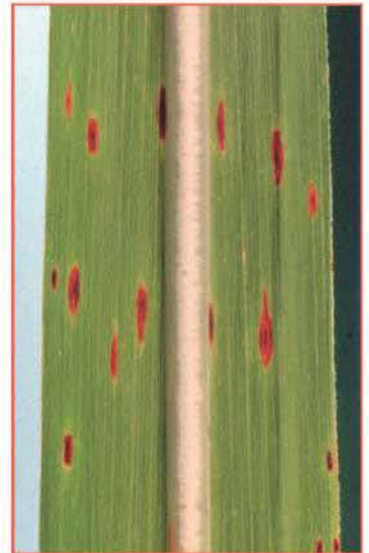
Tawny Rust



Brown Rust



Ring Spot



Brown Spot



# Diseases of Sugarcane

## Less Common Diseases



Leaf Scald  
(bacteria)



Yellow Leaf Syndrome  
(virus)

## Non-Disease Symptoms



Ratoon  
Chlorosis



Banded  
Chlorosis



Herbicide  
Damage



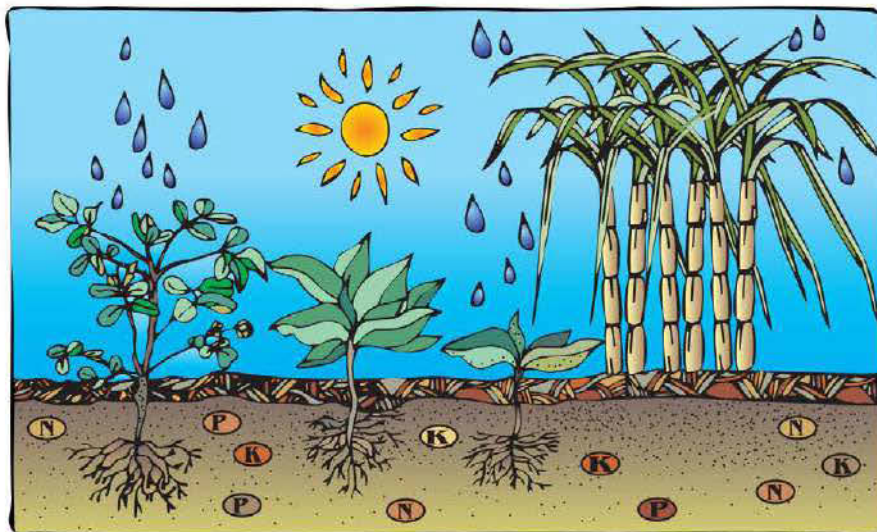
# **WEED CONTROL** **in Sugarcane**

## **What is a weed ?**

**A weed is a plant growing where it is not wanted**

## **Why do we not want weeds ?**

- **Weeds compete with the crop for:**
  - ◆ **Sunlight**     ◆ **Water**     ◆ **Food**



- **Weeds cause crop yield losses**
- **Cane fields should be weed free for at least the first 3 months of cane growth**

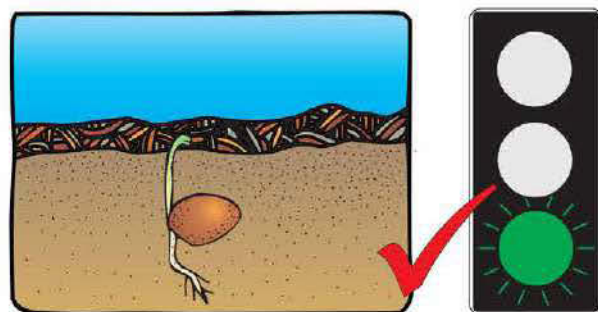


# WEED CONTROL in Sugarcane

## Stages of weed growth

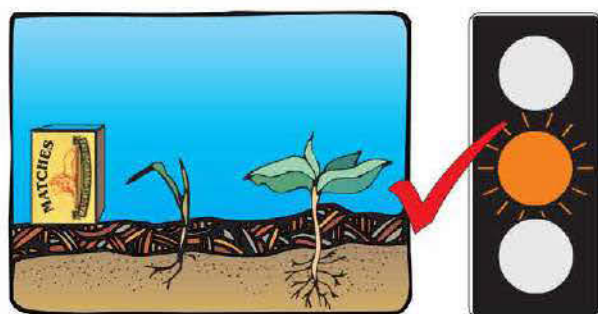
- **Pre - emergence**

- Before the weeds show through the soil



- **Early Post - emergence**

- Grasses: 1 or 2 leaves
- Broadleaf: smaller than a matchbox



- **Post - emergence**

- Grasses: 2 to 4 leaves (before tillering)
- Broadleaf: less than 10cm but before flowering



- **Late Post - emergence**

- Grasses: have tillered
- Broadleaf: taller than 10cm or have flowered

# WEED CONTROL in Sugarcane

## Weed Control Methods

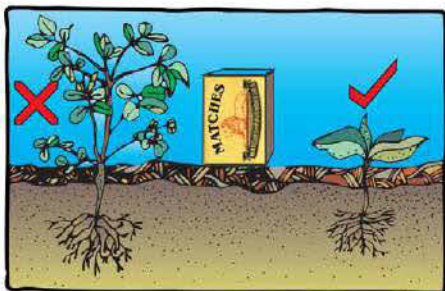
- **By Hand**



**Hoeing may be cheaper**

**T  
U  
B**

- Needs to be done regularly
- Needs many people
- Can be expensive if delayed
- Slow
- Weeds must not get taller than matchbox
- Can replant weeds
- Can damage cane shoots





# WEED CONTROL

## in Sugarcane

### Weed Control Methods

- **By Chemicals**



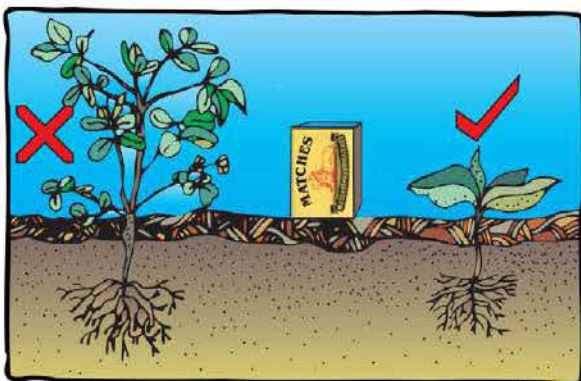
- Requires the correct chemicals
- Requires a knapsack sprayer
- Requires caution

**BUT**

- Lasts longer (up to 16 weeks)
- Is quicker
- Needs moist soil
- Mixing is important

#### **Plant Crop:**

**Spray bare soil after planting**  
**Use a pre-emergent herbicide**



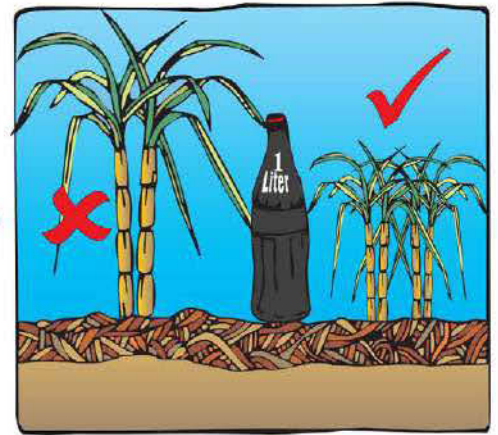
#### **Ratoon Crop:**

**Spray soon after cutting**  
**Weeds must not be taller than a matchbox**

# WEED CONTROL in Sugarcane

## Care when spraying herbicides

- Try not to spray the cane leaves
- Damage is minimized if the cane is young - smaller than a 1 litre cooldrink bottle
- If the cane is taller than 30cm, spray inter row only
- Calibrate the knapsack sprayer regularly
- Use flood jet nozzle



## Storage & usage of herbicides

- Read the labels and instructions carefully
- Store chemicals in a safe place
- Use good quality water - rain water is the best
- Use protective clothing



# WEED CONTROL in Sugarcane

## Symptoms of herbicide damage

- Germination failure
- Stunted growth
- Brown or yellow spots on leaves
- Deformed leaves
- Side shooting





# ALIEN PLANTS

## What is an Alien Plant?



**CHROMOLAENA**  
(South America)



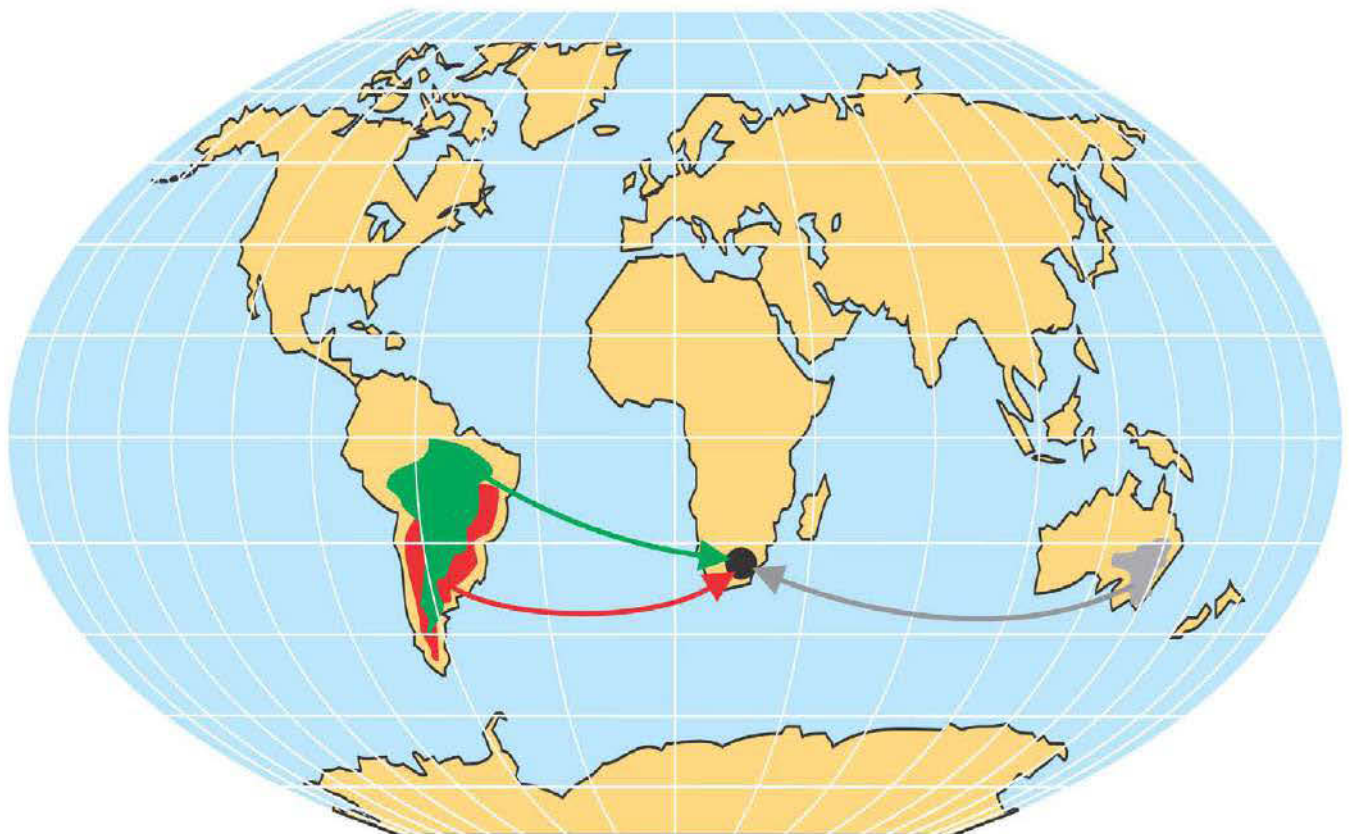
**LANTANA**  
(South America)



**BLACK WATTLE**  
(Australia)

## Where do Alien Plants come from?

Introduced from other countries by accident  
or for its usefulness





# ALIEN PLANTS

## Why control Alien Plants?

**Alien plants compete with other plants for:**

- Sunlight
- Water
- Food
- Space

- Kills natural grasses
- Increases erosion
- Destroys natural habitats



## Why Alien Plants are invasive?

- **Produce many seeds**  
Chromolaena produces millions of seeds
- **Seeds can survive a long time**  
Black Wattle seeds can survive for  $\pm 80$  years re-infestation occurs
- **Seeds spread easily**  
Wind, water, animals or machinery
- **Few natural enemies**

# ALIEN PLANTS

## Identification and Categories

### CATEGORY 1

- Must be removed and controlled.

1. Triffid Weed
2. Lantana
3. Bug Weed
4. Pereskia



Triffid Weed



Lantana



Bug Weed



Pereskia



# ALIEN PLANTS

## Identification CATEGORY 2

- Only allowed with a permit from Agricultural Resource Management
- Spread must be controlled.

1. Guava
2. Black Wattle
3. Gum
4. Pine



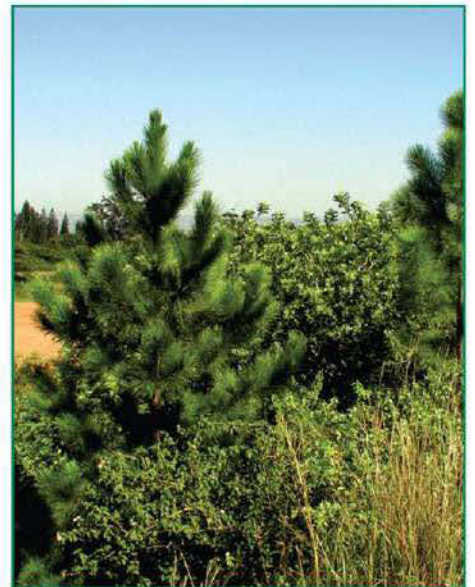
Guava



Black Wattle



Gum



Pine



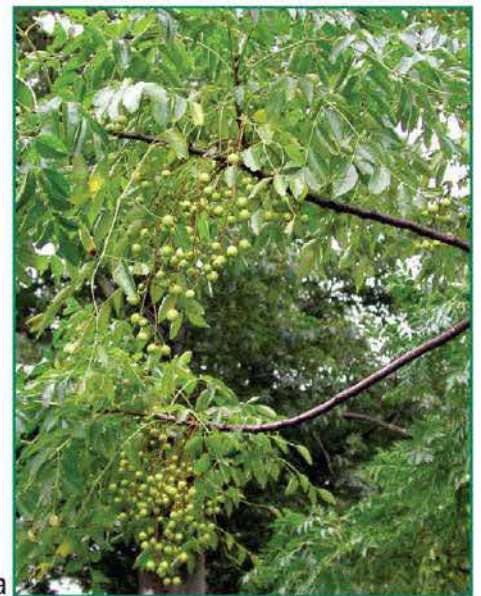
# ALIEN PLANTS

## Identification

### CATEGORY 3

- Trade or further planting is not allowed.

1. Syringa
2. Jacaranda
3. Loquat
4. Mulberry



Syringa



Jacaranda



Loquat



Mulberry



# ALIEN PLANTS

## Control methods

- Mechanical
- Biological
- Chemical

### MECHANICAL

- Hand pulling of seedlings
- Slashing and burning
- Strip barking



### BIOLOGICAL

- Uses natural enemies
- Most effective in dense growth
- Host-specific (only eats Alien plants **NOT** the crop)



### CHEMICAL

#### Applied to:

- Cut stump
- Basal stem
- Foliage





# ALIEN PLANTS

## Equipment & Treatments

### Paint brush

- Used for cut stumps and basal stem treatment.



### Bush knife / slasher

- Cut stump
- Strip barking
- Dense growth cut back

### Knapsack Sprayer with solid cone nozzle

- Used for short regrowth.
- Foliar spray
- Cut stump



### Treatment for tall regrowth

- Cut back dense growth in winter
- Spray regrowth in spring
- Regrowth must be knee to waist high
- Hand slash + knapsack spray





# ALIEN PLANTS

## Stages of Control

All stages require followup control

### Step 1. LIGHT CONTROL

- Fewer alien plants
- Cheaper and easier to control



### Step 2. MEDIUM CONTROL

- Remove seedlings, roots suckers and re-growth from stumps

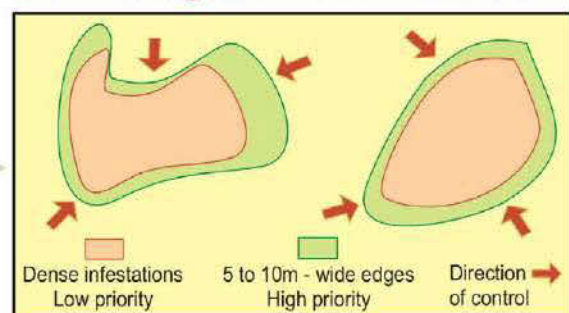


### Step 3. DENSE CONTROL

- Control of larger plants
- Adult plants will produce seeds
- Start only when light and medium control have been done

- If money is not available control the edges of dense areas

Confine edges of dense infestations



- Encourage grass to grow and stabilize soil, preventing erosion



# ALIEN PLANTS

## Care and use of Herbicides

- Identify the Alien plant.
- Choose a suitable herbicide.
- Choose the correct application method.
- Herbicides are dangerous and expensive so follow label recommendations.
- Users should be trained on the use of herbicides.
- Mix chemicals correctly.
- Use good quality water.
- Wear protective clothing at all times.
- Store herbicides in a safe place.
- Burn empty herbicide containers.

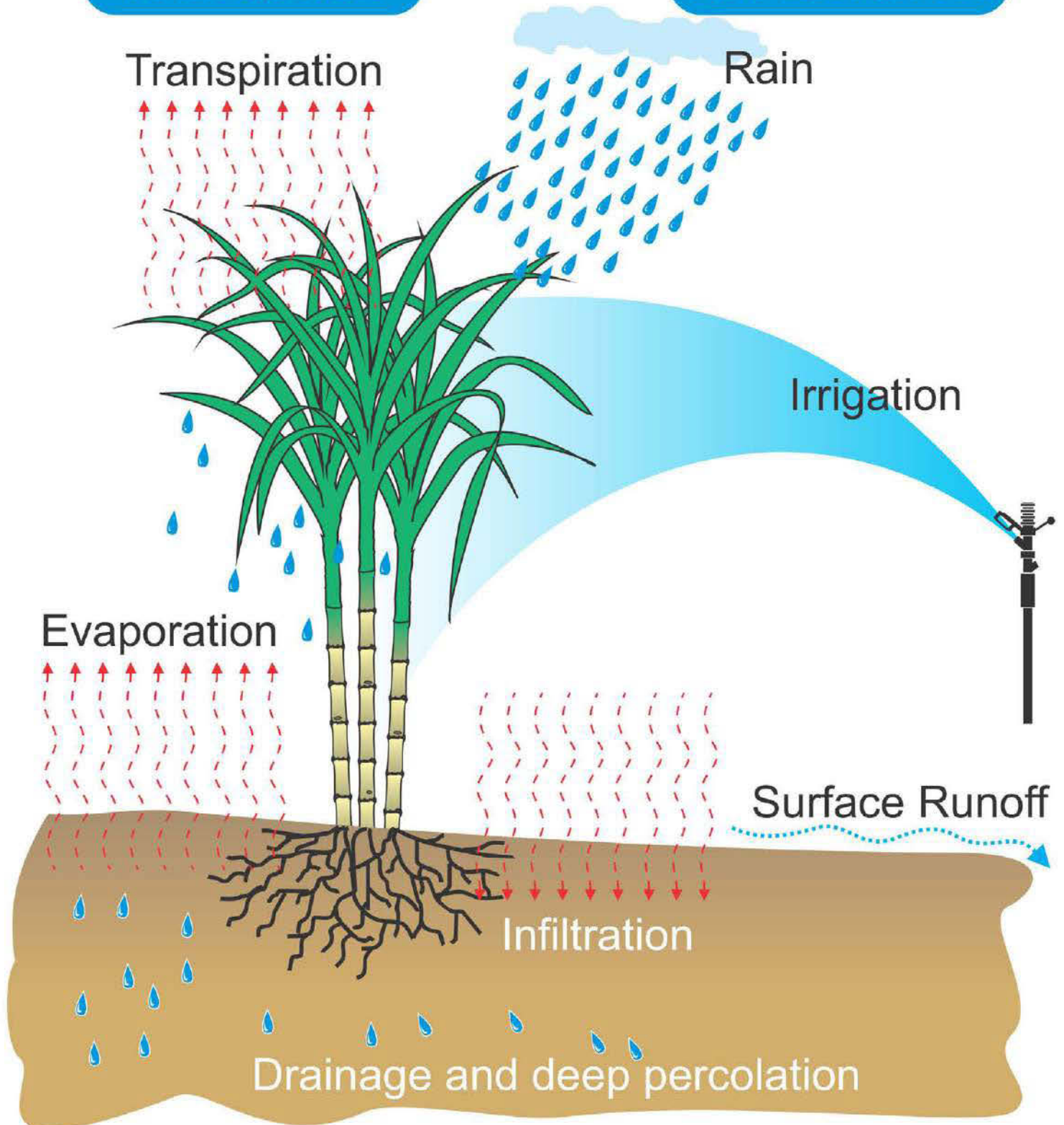




# IRRIGATION

## WATER USE

## APPLICATION



# IRRIGATION



Pivot



Drip



Drag Line

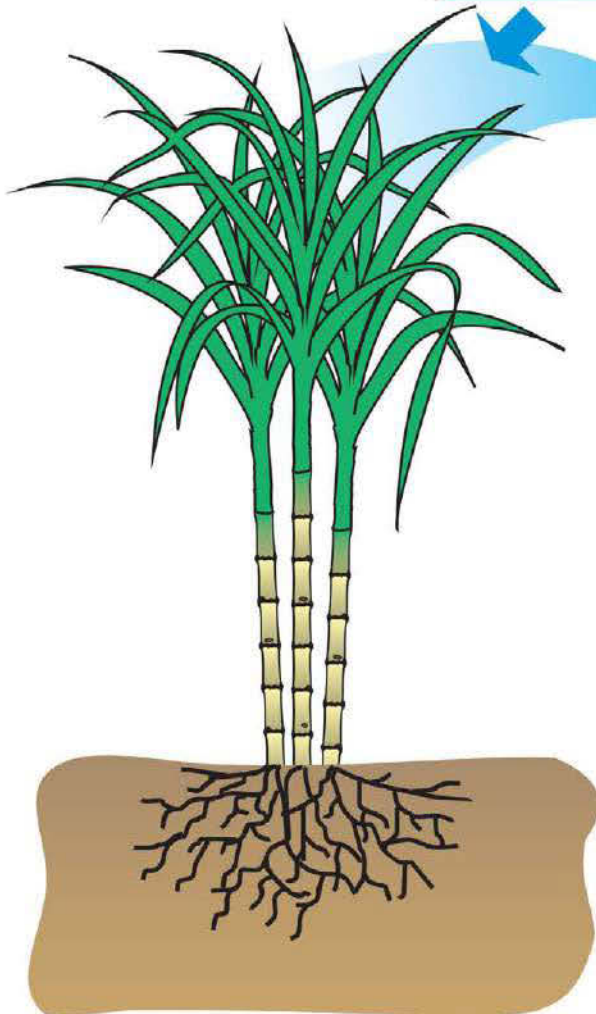


Solid Set  
(flop)

Water use + loss



Adequate application



Water use + loss

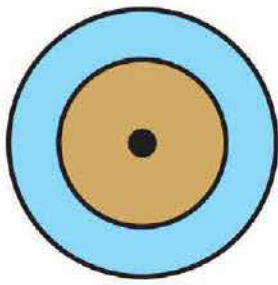


Poor application

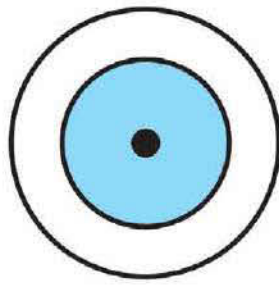




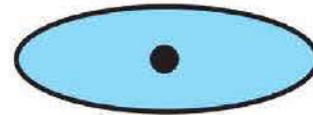
# IRRIGATION SYSTEMS



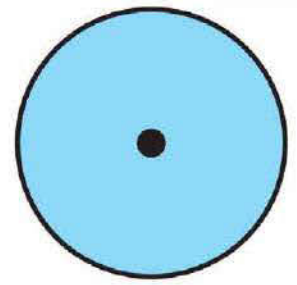
Low Pressure



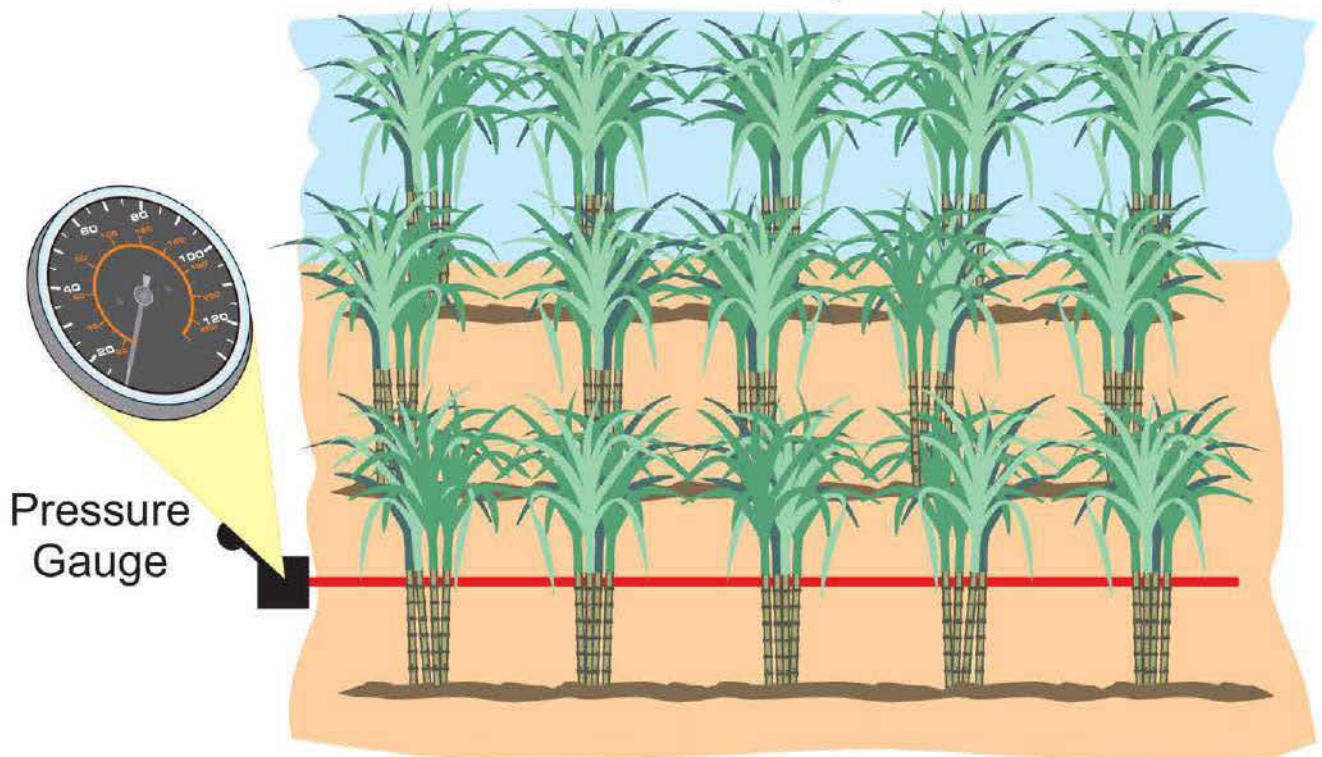
High Pressure



Skew Stand Pipe



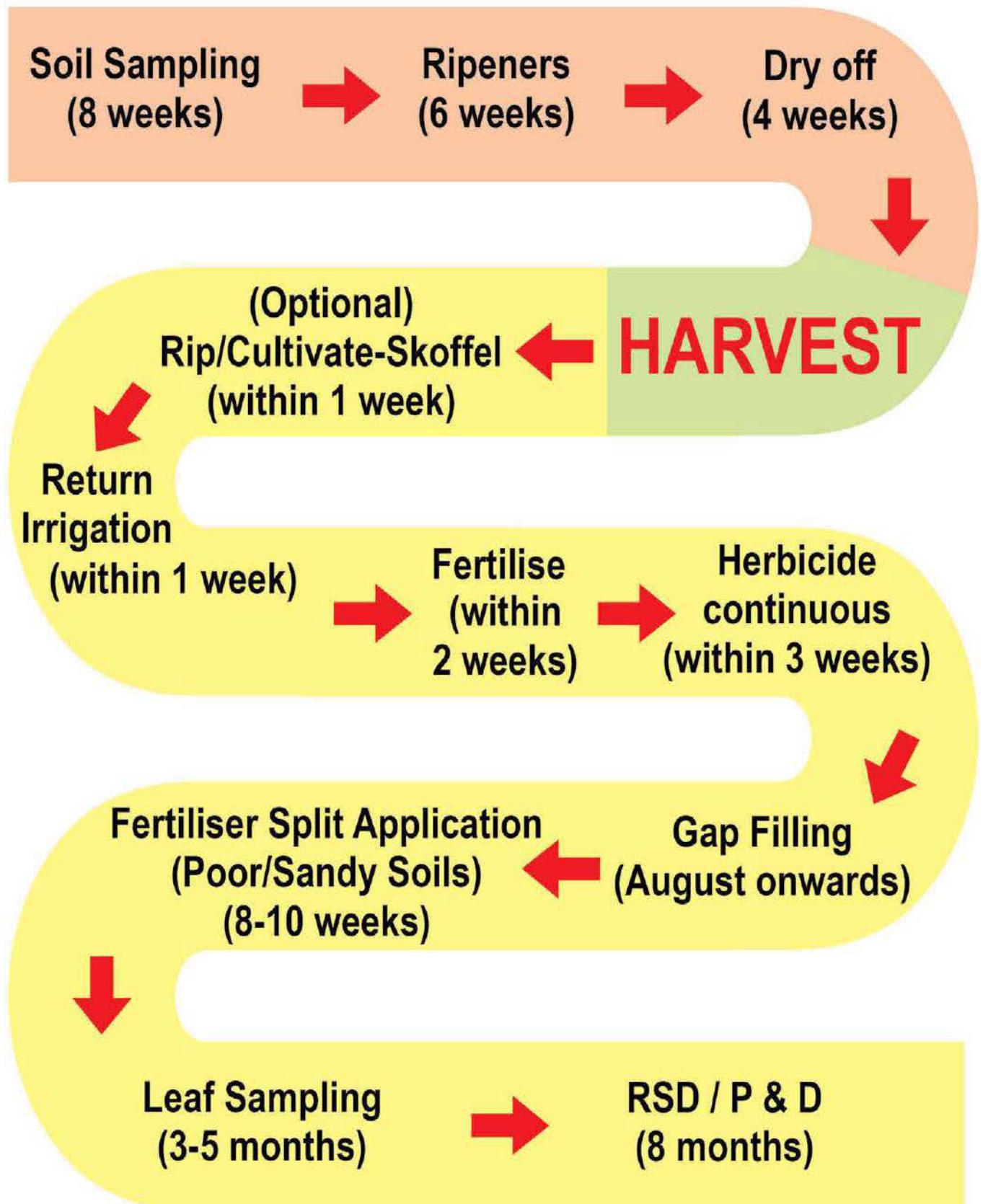
Correct Pressure



## Causes of incorrect application

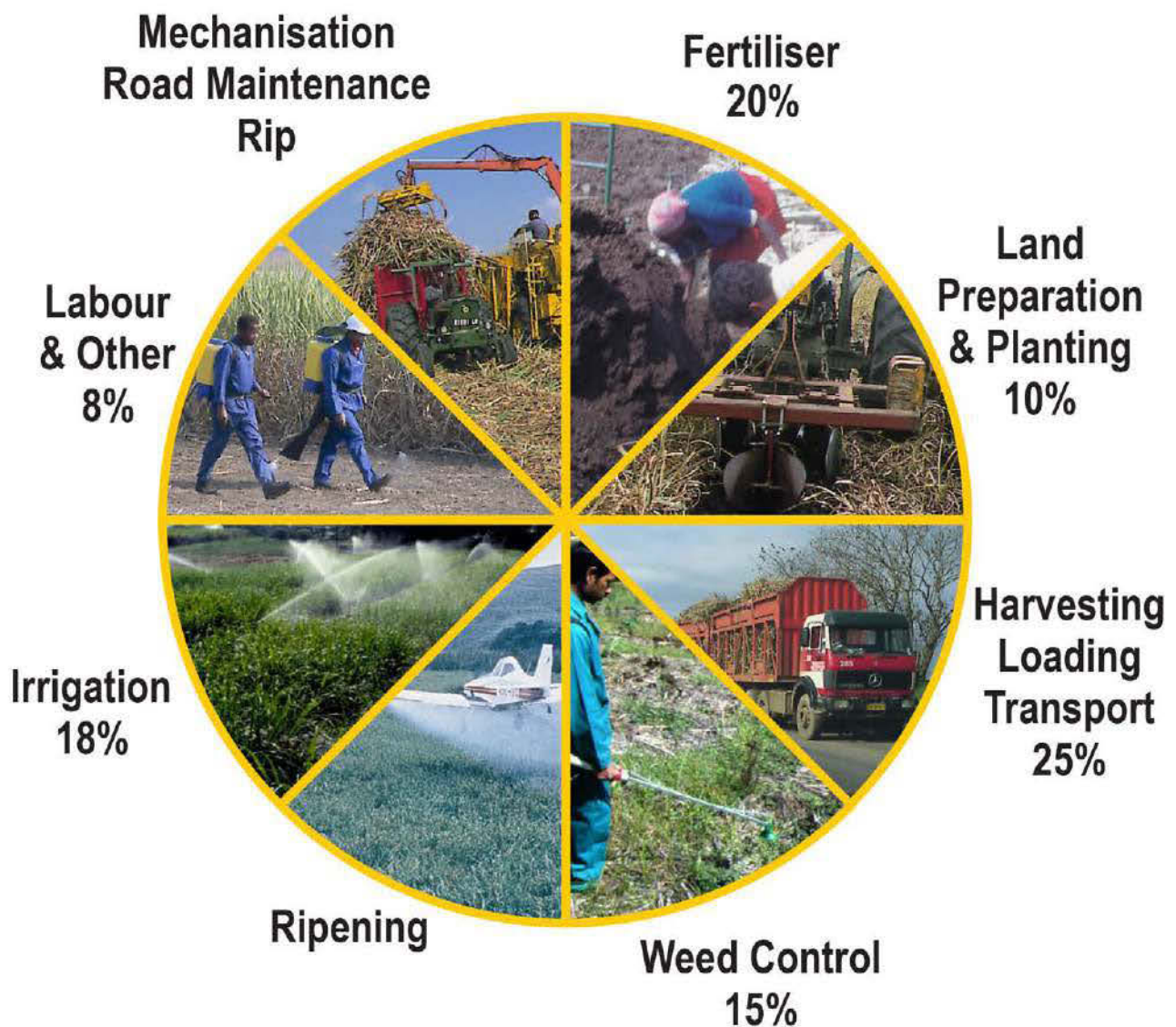
1. Low pressure.
2. Leaks.
3. Incorrect nozzle size (change annually).
4. Too many sprinklers per ha.
5. Expansion beyond irrigation design.

# IRRIGATION

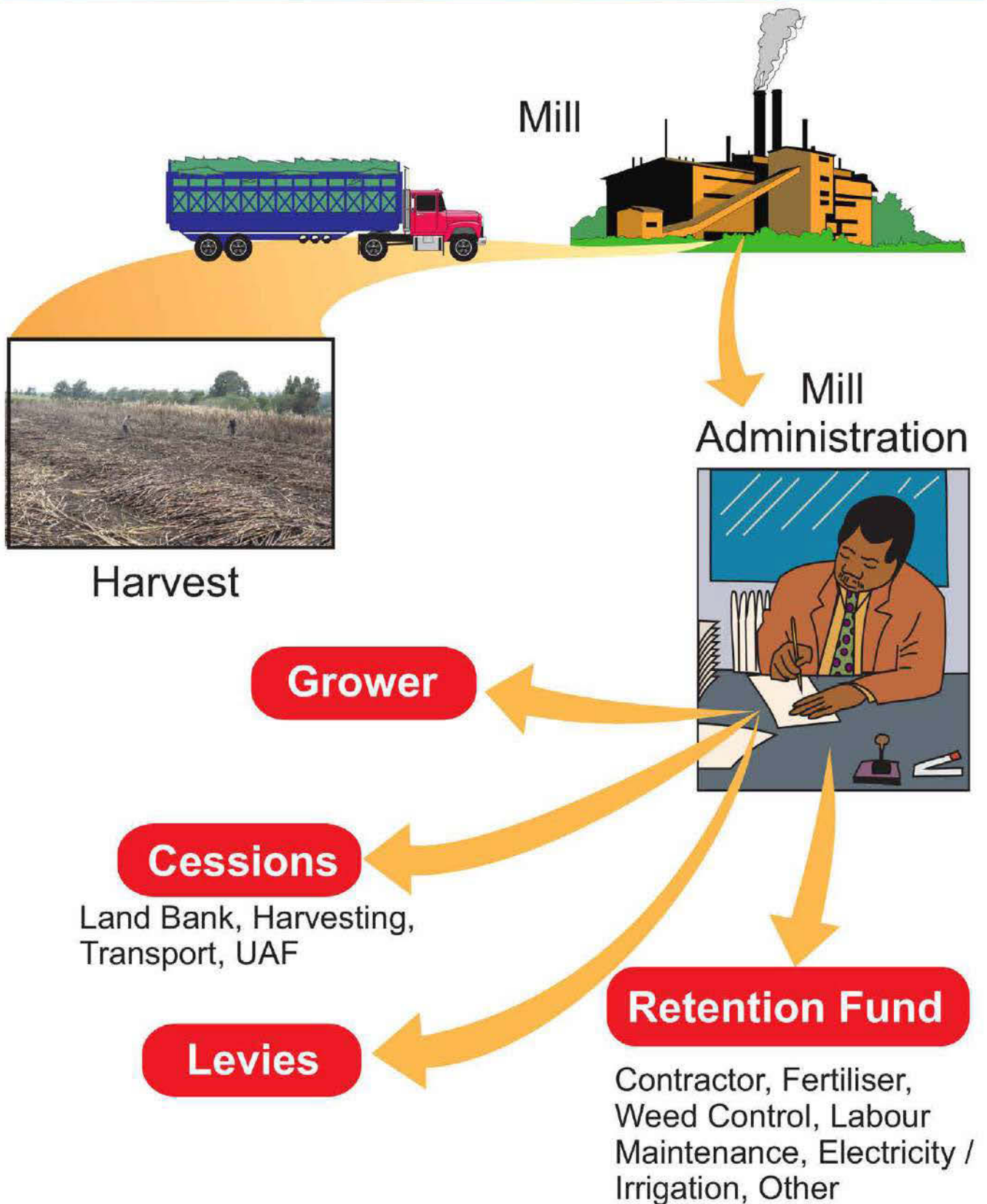




# INPUT & PRODUCTION COSTS



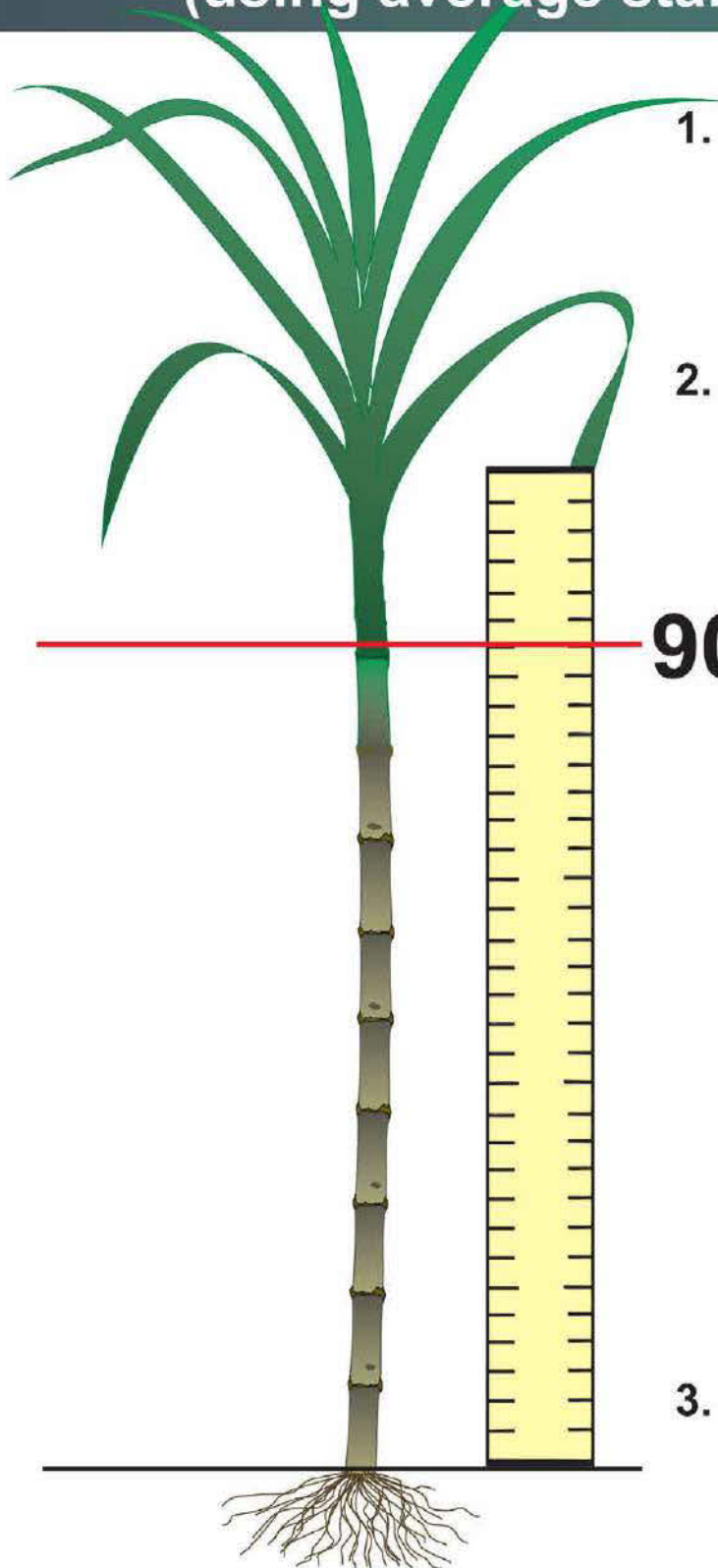
# FLOW OF MONEY





# YIELD ESTIMATE

(using average stalk length  $\div$  2)



1. Measure the length of an average size stalk from the ground to the natural breaking point (eg 90cm).
2. Repeat this 10 times at different places in the field and calculate the average stalk length

**90 cm**

**Example =**

90
96
89
101
75
94 cm
84
102
92
81
<u>904</u> cm

3. Average stalk length=  
 $904 \div 10 = 90.4 \text{ cm}$

**Estimated yield** = Average length  $\div$  2 =  $90.4 \div 2 = 45.2 \text{ tons/ha}$

# YIELD ESTIMATE

## Increment

Use the increment table to calculate how much extra growth is expected from the date the estimate was done to the date when harvesting is expected.

### GROWTH INCREMENT (tc/ha/month)

	3 tons	4 tons	5 tons	6 tons	7 tons	10 tons
MONTH	(v low)	(low)	(moderate)	(high)	(v high)	(irrig.)
April	4	5	6	7	8	12
May	1	2	3	4	5	7
June	0	1	2	3	4	6
July	0	0	1	2	3	4
August	0	0	1	2	3	4
September	0	1	2	3	4	6
October	1	2	3	4	5	7
November	4	5	6	7	8	12
December	6	7	8	9	10	14
January	7	9	10	11	12	17
February	7	9	10	11	12	17
March	6	7	8	9	10	14
<b>Total</b>	<b>36</b>	<b>48</b>	<b>60</b>	<b>72</b>	<b>84</b>	<b>120</b>



# YIELD ESTIMATE

## Example

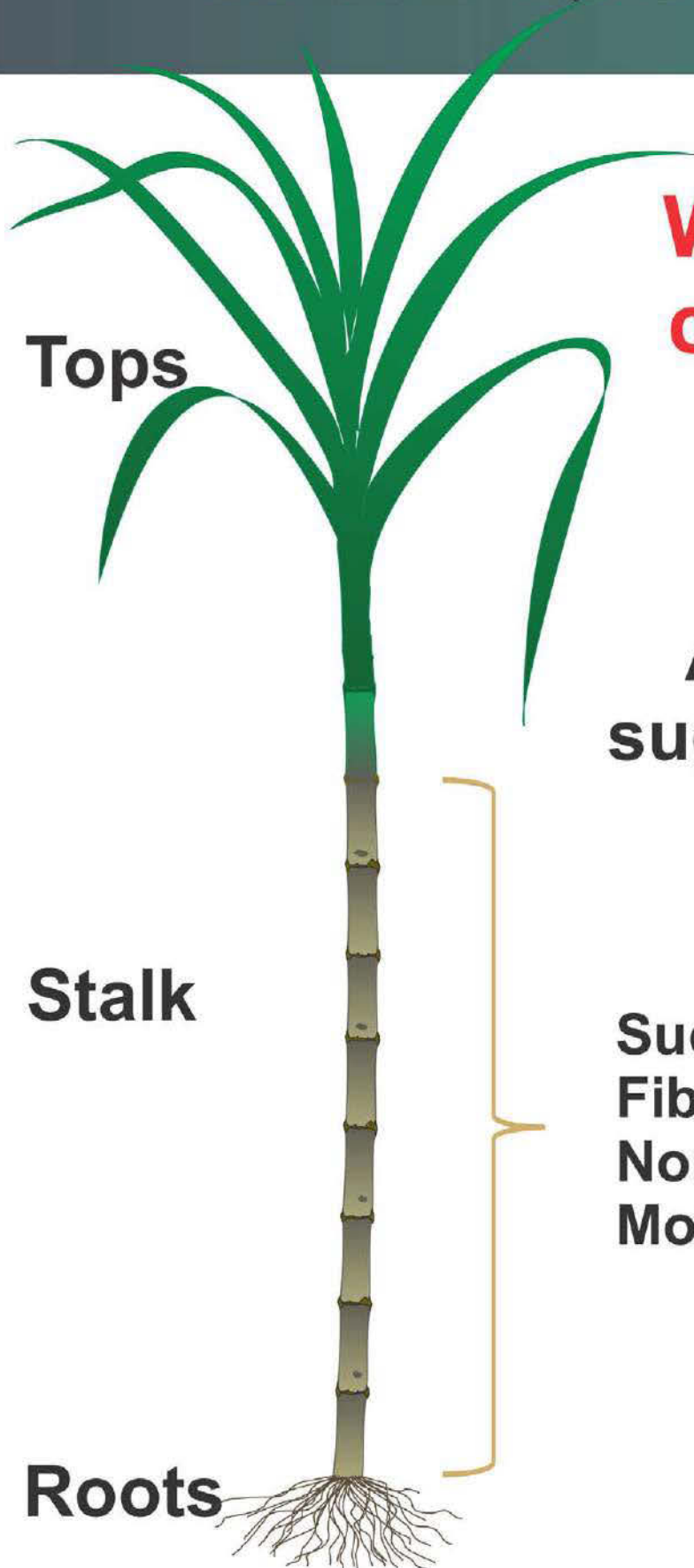
- Estimate date 2 June
- Cane age 9 months
- Estimate 45tc/ha
- Increment category  $45\text{tc/ha} \div 9 \text{ months} = 5\text{tc/month}$  (moderate)
- Expected harvest date 30 August (12 months)
- Add to the estimated yield of 45tc/ha the yield increments for the months of June, July and August.
- From the increment table

### GROWTH INCREMENT (tc/ha/month)

	3 tons	4 tons	5 tons	6 tons	7 tons	10 tons
MONTH	(v low)	(low)	(moderate)	(high)	(v high)	(irrig.)
April	4	5	6	7	8	12
May	1	2	3	4	5	7
June	0	1	2	3	4	6
July	0	0	1	2	3	4
August	0	0	1	2	3	4
September	0	1	2	3	4	6
October	1	2	3	4	5	7
November	4	5	6	7	8	12
December	6	7	8	9	10	14
January	7	9	10	11	12	17
February	7	9	10	11	12	17
March	6	7	8	9	10	14
Total	36	48	60	72	84	120

Final estimate at harvest = 45tc/ha + 4tc/ha = **49tc/ha**

# CANE QUALITY



**What is in a cane stalk?**

**An average sugarcane stalk has:**

<b>Sucrose</b>	<b>12.5%</b>
<b>Fibre</b>	<b>15%</b>
<b>Non-sucrose</b>	<b>2.5%</b>
<b>Moisture</b>	<b>70%</b>
	<b>100%</b>



# CANE QUALITY



**1 ton of  
sugarcane stalks  
will have**

<b>Sucrose</b>	<b>125 kg</b>
<b>Fibre</b>	<b>150 kg</b>
<b>Non-sucrose</b>	<b>25 kg</b>
<b>Moisture</b>	<b>700 kg</b>



# WHAT INFLUENCES CANE QUALITY?

## Quality begins in the field

### Management

- Seedcane quality
- Variety
- Land prep
- Weed free
- Well Fertilised
- Pest and disease free



### Harvesting

- Cane age
- Topping
- Base cutting
- Clean cane *no trash*  
*no sand*  
*no roots*



### Delays

#### Burn to crush

- Burn only enough for 1 or 2 days delivery
- Mill as soon as possible
- Fresh cane = good quality
- Don't leave bundles in the field

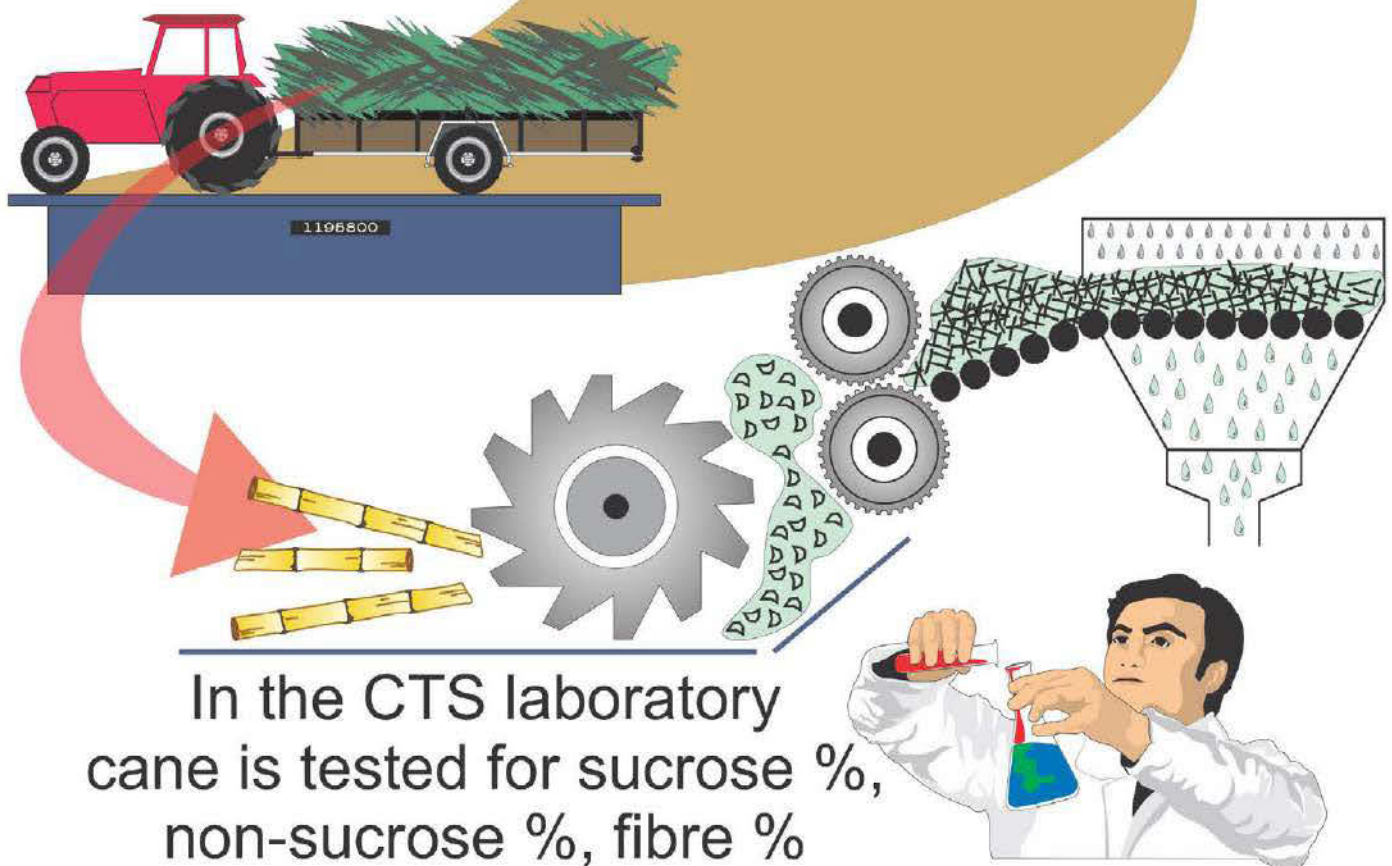




# HOW IS CANE QUALITY MEASURED?



At the mill cane quality is measured by C.T.S. and **not** the miller



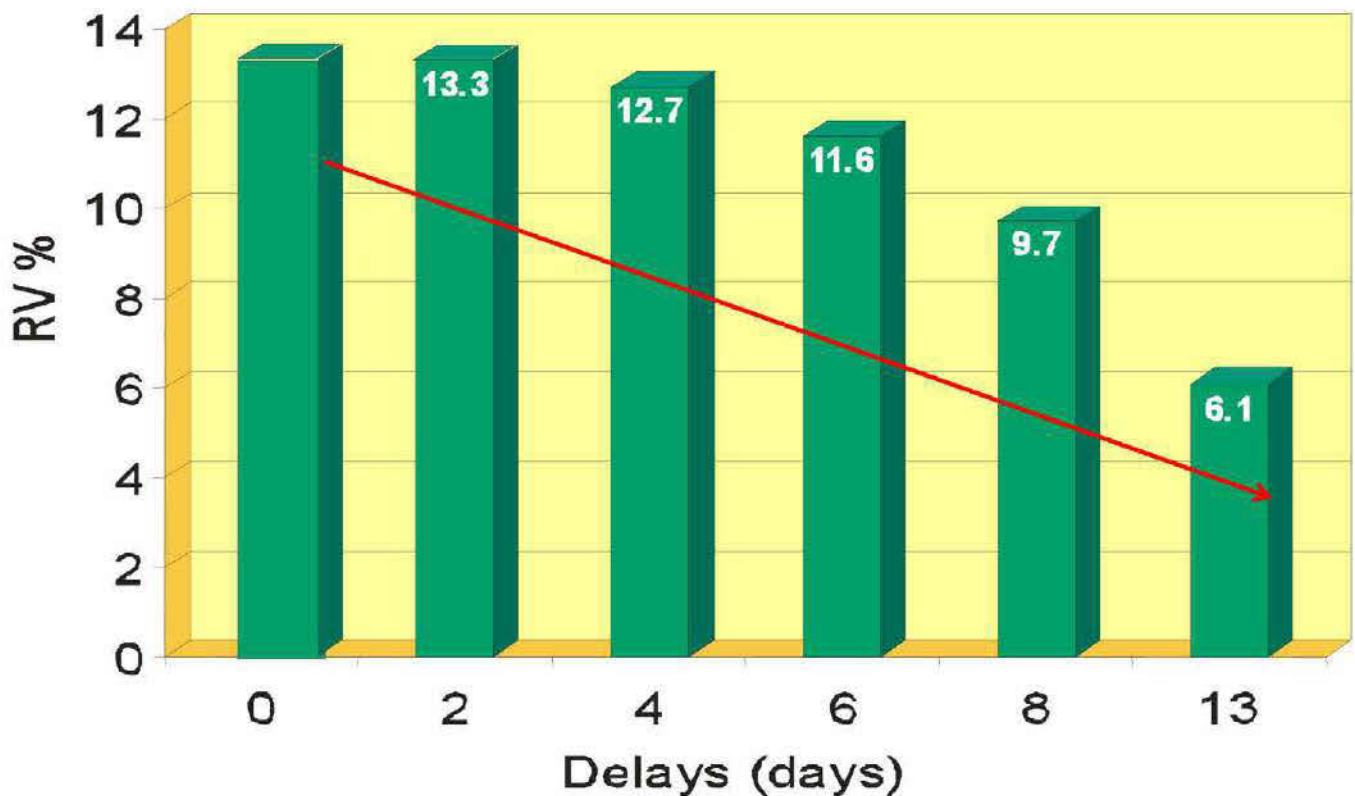
# WHERE DO LOSSES OCCUR

Because cane quality affects sugar production





# WHAT DO DELAYS COST?



## Consequence of delays

- Loss of sucrose%
- Loss of moisture%
- Increase in fibre%
- Increase in non-sucrose%

LOSS OF  
REVENUE

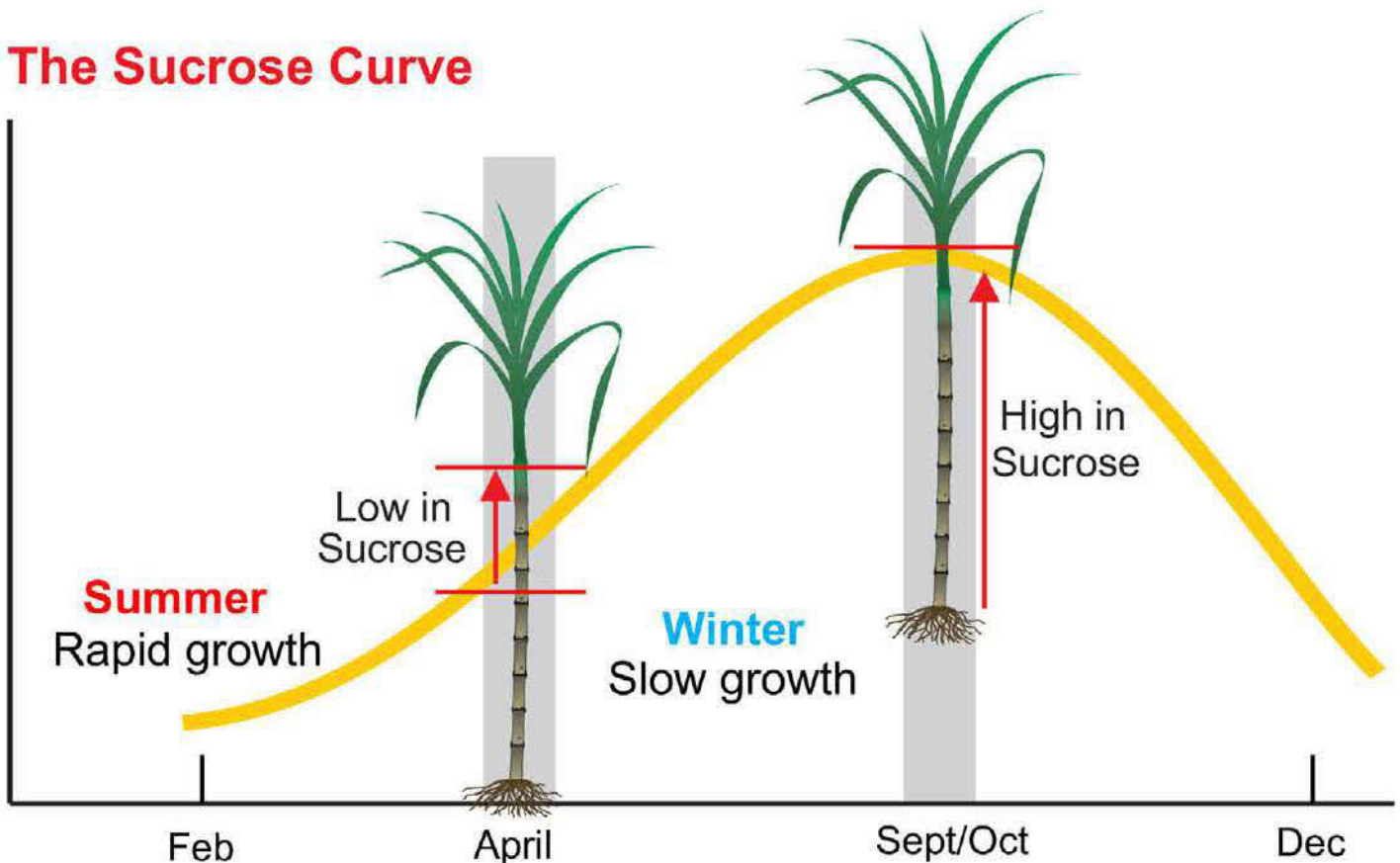
# RELATIVE PAYMENT

- In **Summer** - Cane plant grows **rapidly**.  
There is low storage of sucrose.
- In **Winter** - Cane plant grows **slowly**  
More sucrose is stored.

**So:-**

- When the mills open (April) the overall sucrose content of cane is low.
- But in September/October the overall sucrose content of cane is much higher.
- In December, summer has again returned and the storage of sucrose drops.

## The Sucrose Curve





# RELATIVE PAYMENT

## What does this mean?

- Cane sent to the mill at the beginning of the milling season or from December has a lower value.
- Cane sent to the mill in September/October has a higher value.

## The Relative Payment System

- Compensates farmers who must deliver cane in the low sucrose period
- Adjusts payment to farmers who deliver during the high sucrose period

## The Result

- No-one is disadvantaged
- No-one gains an unfair advantage

The Relative payment system is designed to share the proceeds of the entire crop **FAIRLY** amongst all the growers.

# RELATIVE PAYMENT

How is this done?

## The Relative Payment Formula

$$RV\% = \text{Growers weekly average} - \text{Mills weekly average} + \text{Season average}$$



The Mill Group Board decides on this value by experience and knowing what the current crop looks like.



# RELATIVE PAYMENT

## Example 1

$$RV\% = \text{Growers weekly average} - \text{Mills weekly average} + \text{Season average}$$

Season Average = 11%  
(decided by the Mill Group Board)

### APRIL (beginning of season)

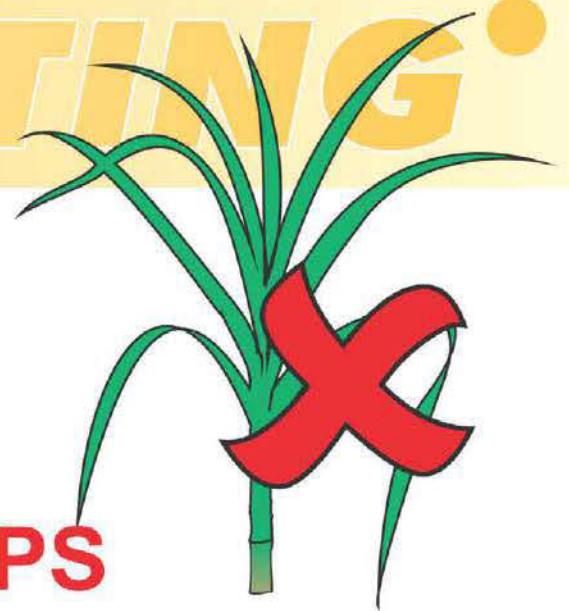
Week	Grower	Mill	Season	RV%
1	9.1	- 8.6	+ 11.0	= 11.5
2	8.3	- 8.4	+ 11.0	= 10.9
3	10.1	- 9.2	+ 11.0	= 11.9
4	8.5	- 7.8	+ 11.0	= 11.7
Av	9.0	- 8.5	+ 11.0	= 11.5

# Harvesting

What part of the sugarcane plant should be milled?

## TOPS

- Contain very little sucrose.
- Leave these in the field.



## STALKS

- Contain sucrose.
- This is the millable part.



## DRIED LEAVES

- Contains no sucrose.
- Remove dried leaves from the stalks.
- Cane with too many dried leaves may be rejected.





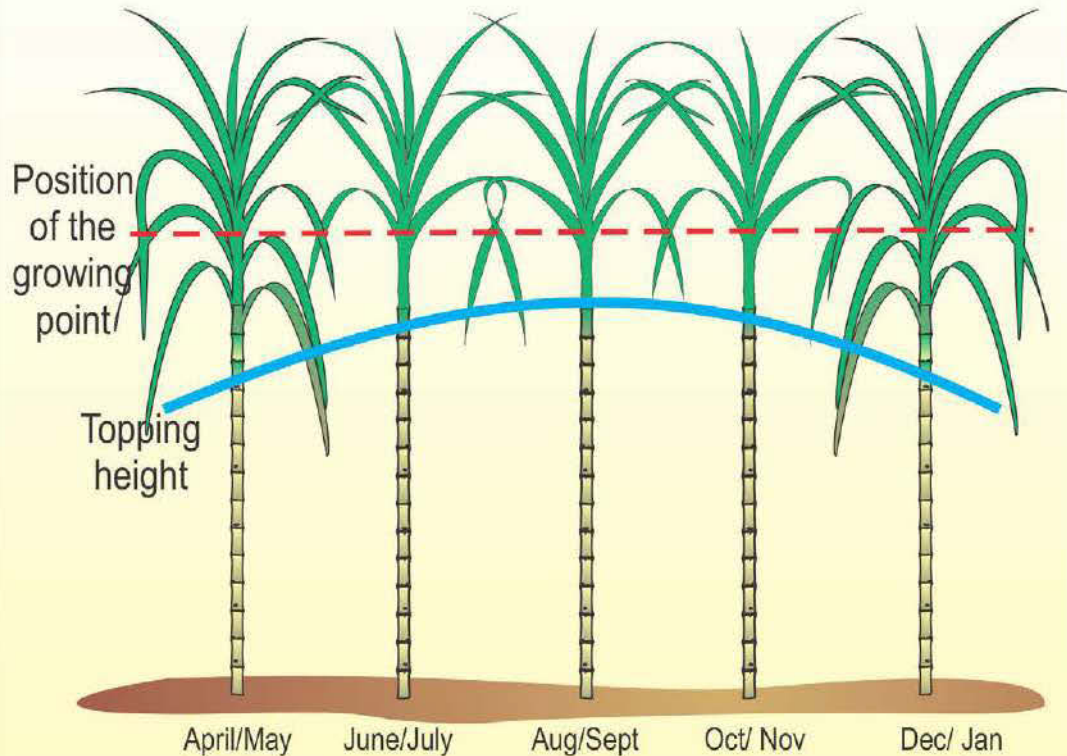
# HARVESTING

## 1. Vary the topping height throughout the season

## 2. Use the taste test

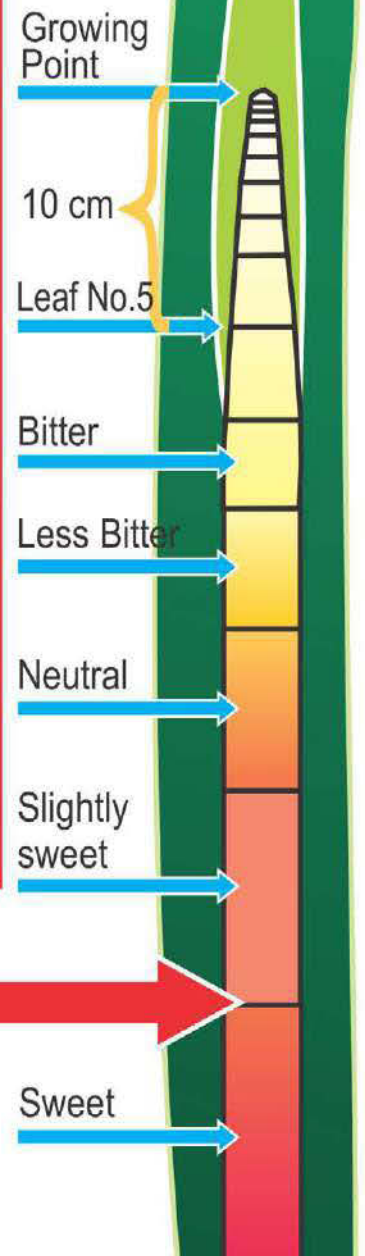
Young, immature cane has a long top with many green leaves.

Older, mature cane has a shorter top with fewer green leaves.

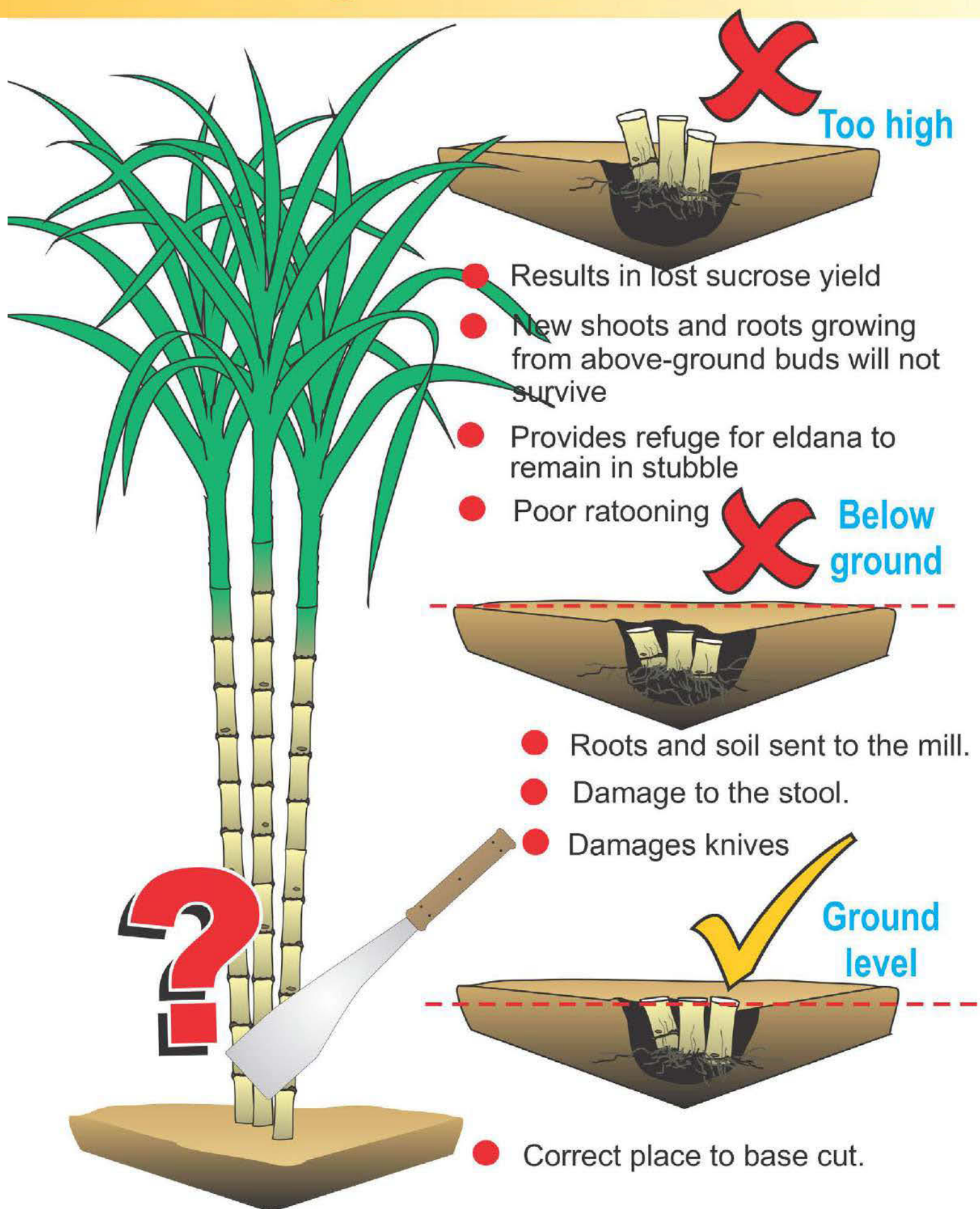


### Top cane lower:

- at the beginning and end of season
- when young and immature
- when transporting long distances to the mill



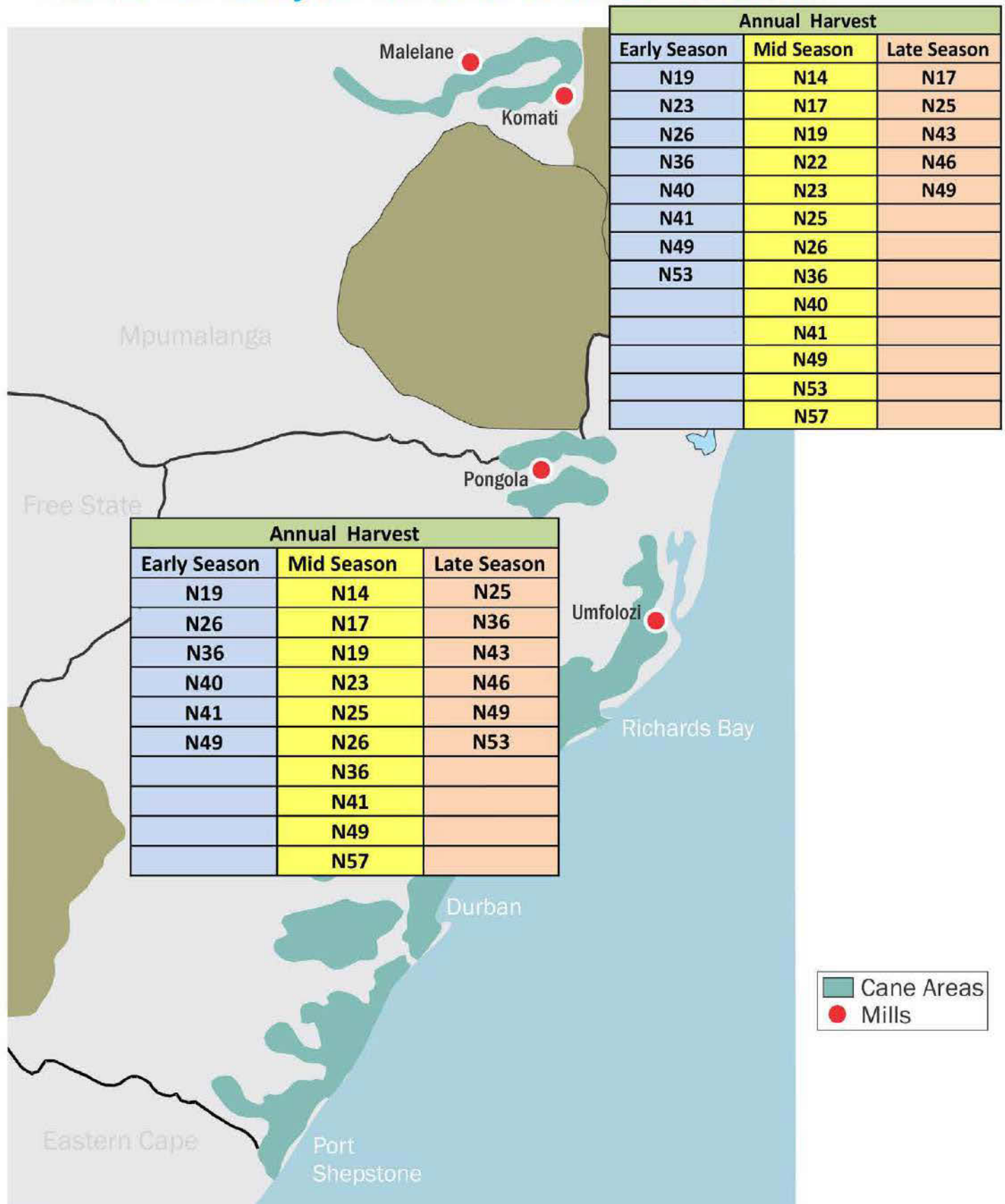
# Base Cutting HARVESTING





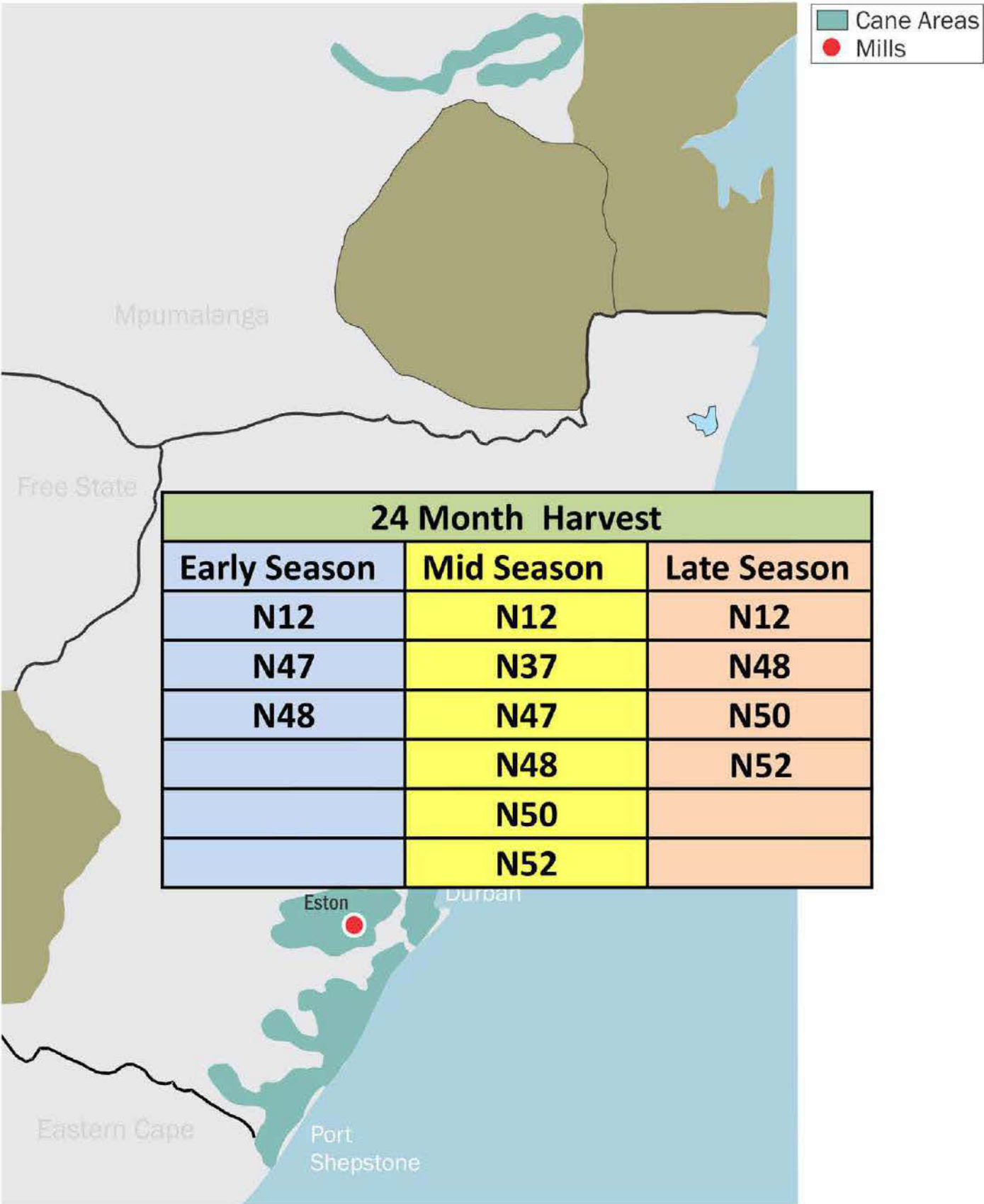
# Timing HARVESTING

- Different varieties should be cut at different times of the year.
- Plan to harvest your varieties at the correct time.



# Timing HARVESTING

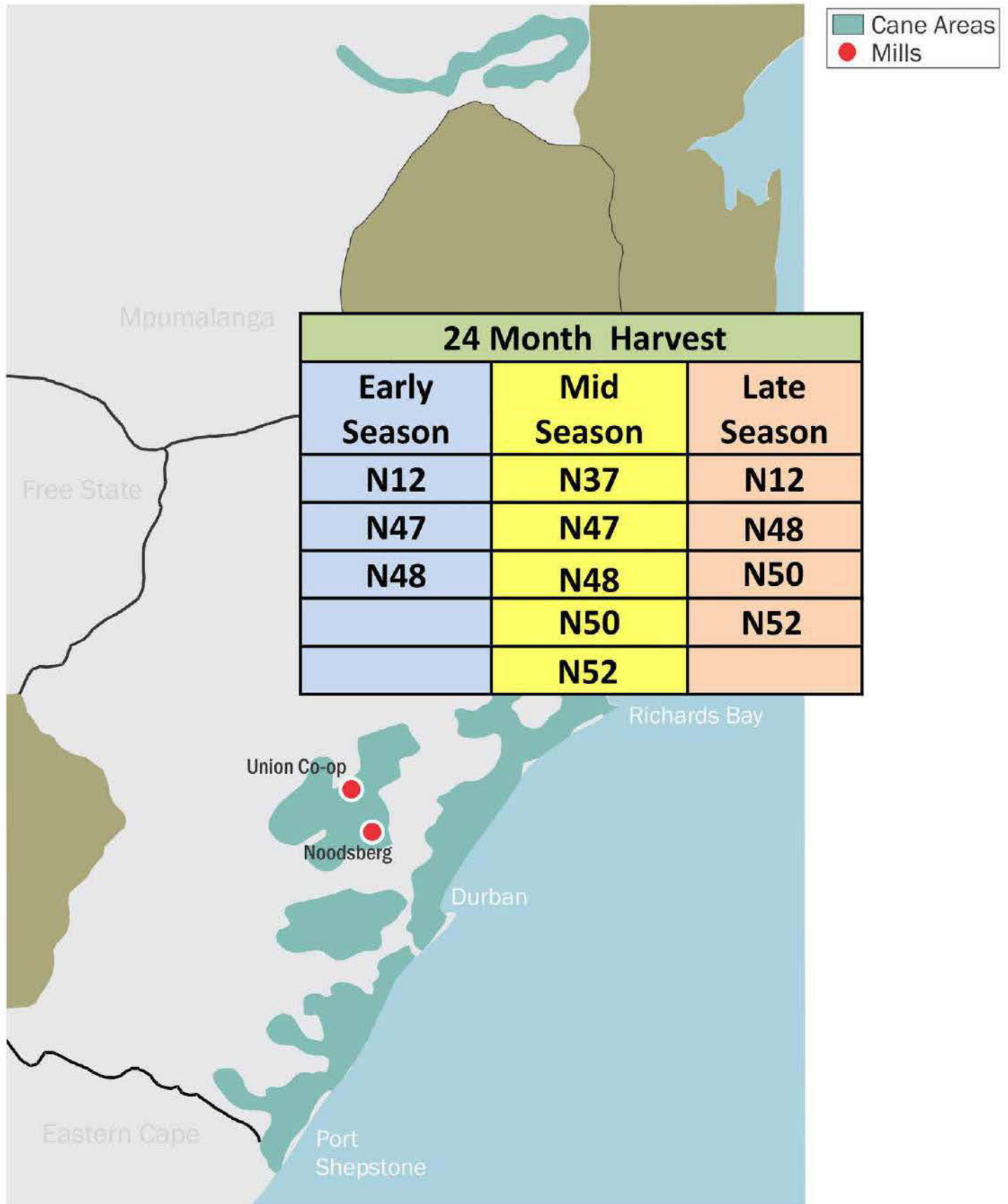
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# Timing HARVESTING

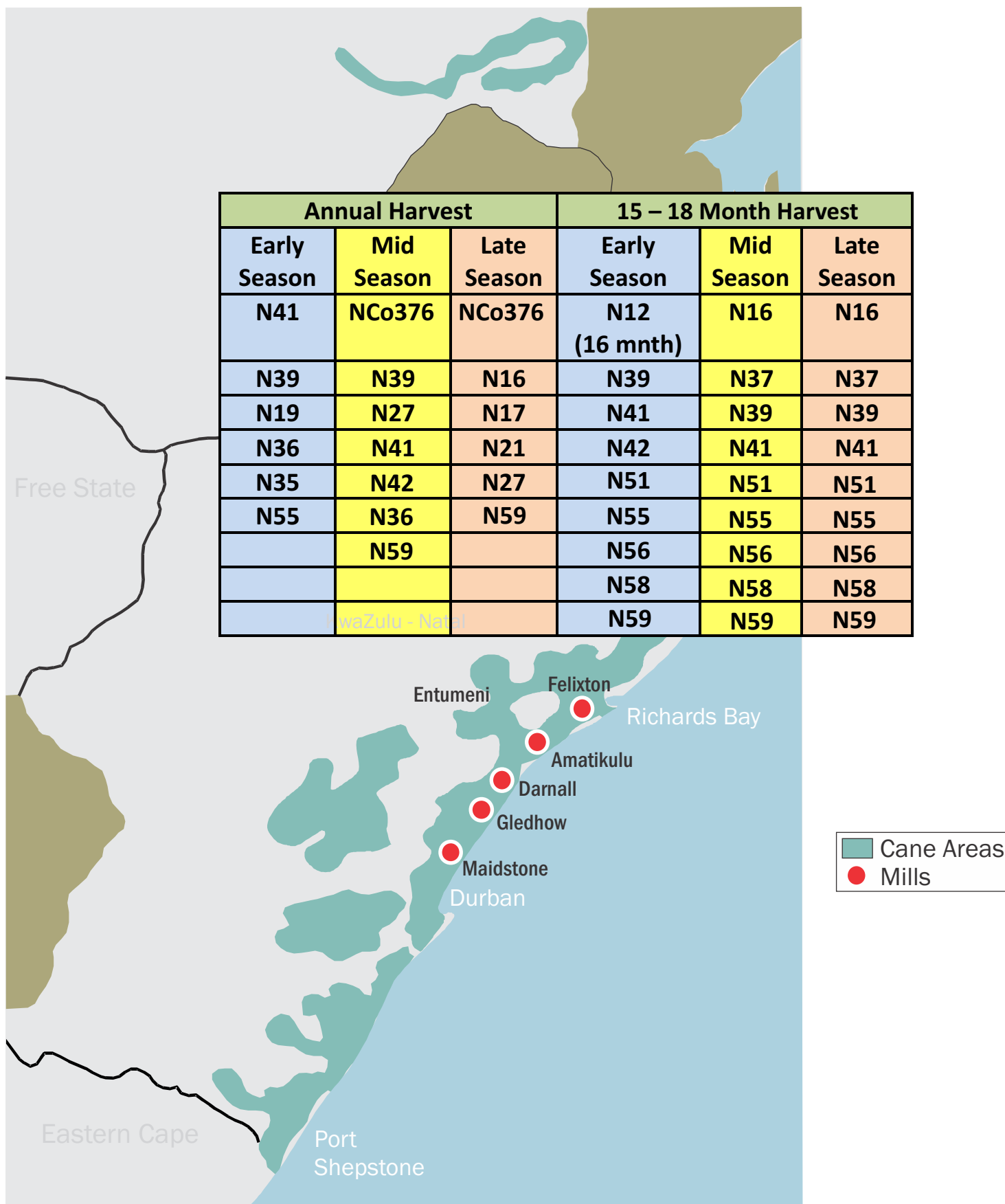
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# Timing HARVESTING

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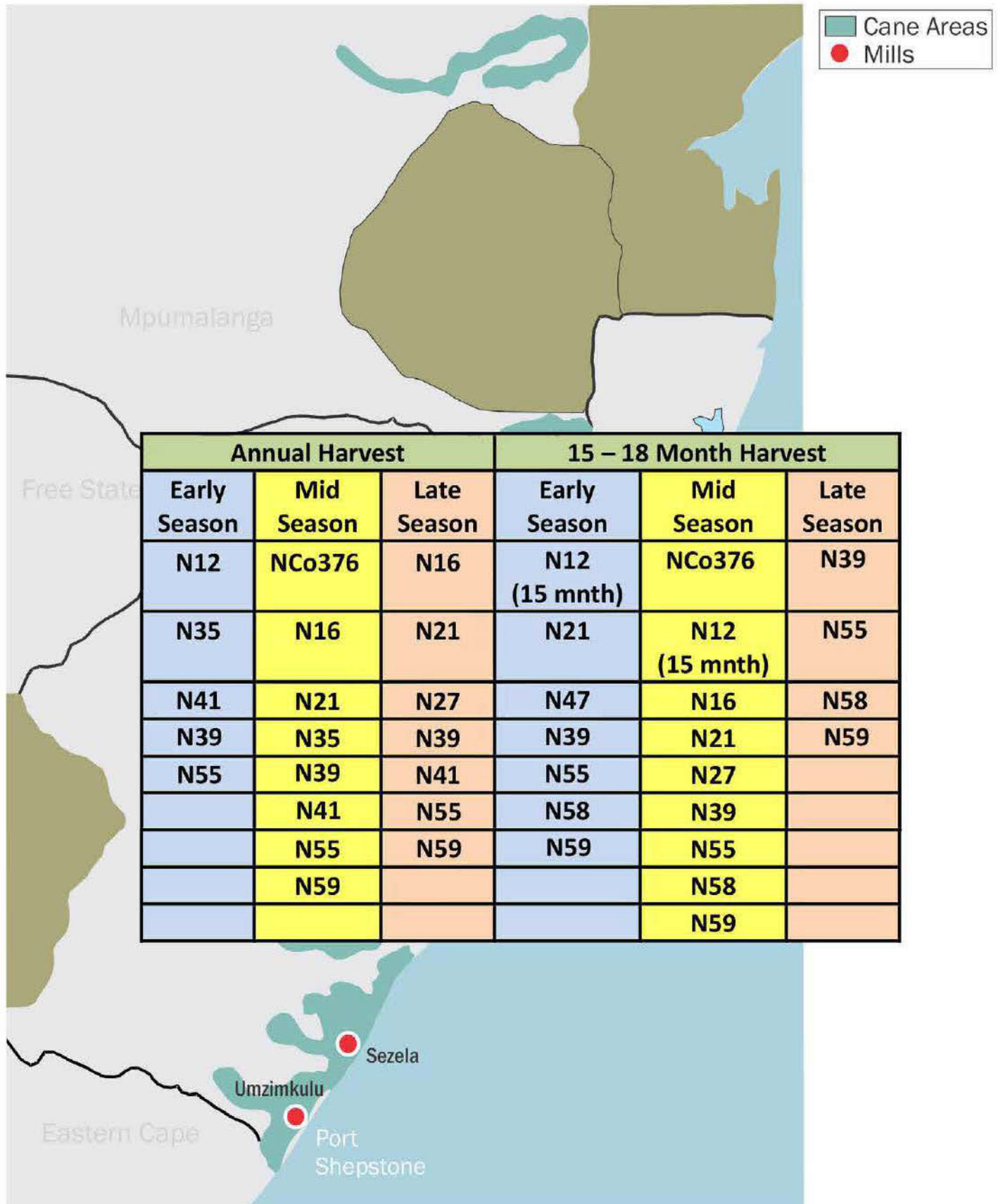
Annual Harvest			15 – 18 Month Harvest		
Early Season	Mid Season	Late Season	Early Season	Mid Season	Late Season
N41	NCo376	NCo376	N12 (16 mnth)	N16	N16
N39	N39	N16	N39	N37	N37
N19	N27	N17	N41	N39	N39
N36	N41	N21	N42	N41	N41
N35	N42	N27	N51	N51	N51
N55	N36	N59	N55	N55	N55
	N59		N56	N56	N56
			N58	N58	N58
			N59	N59	N59



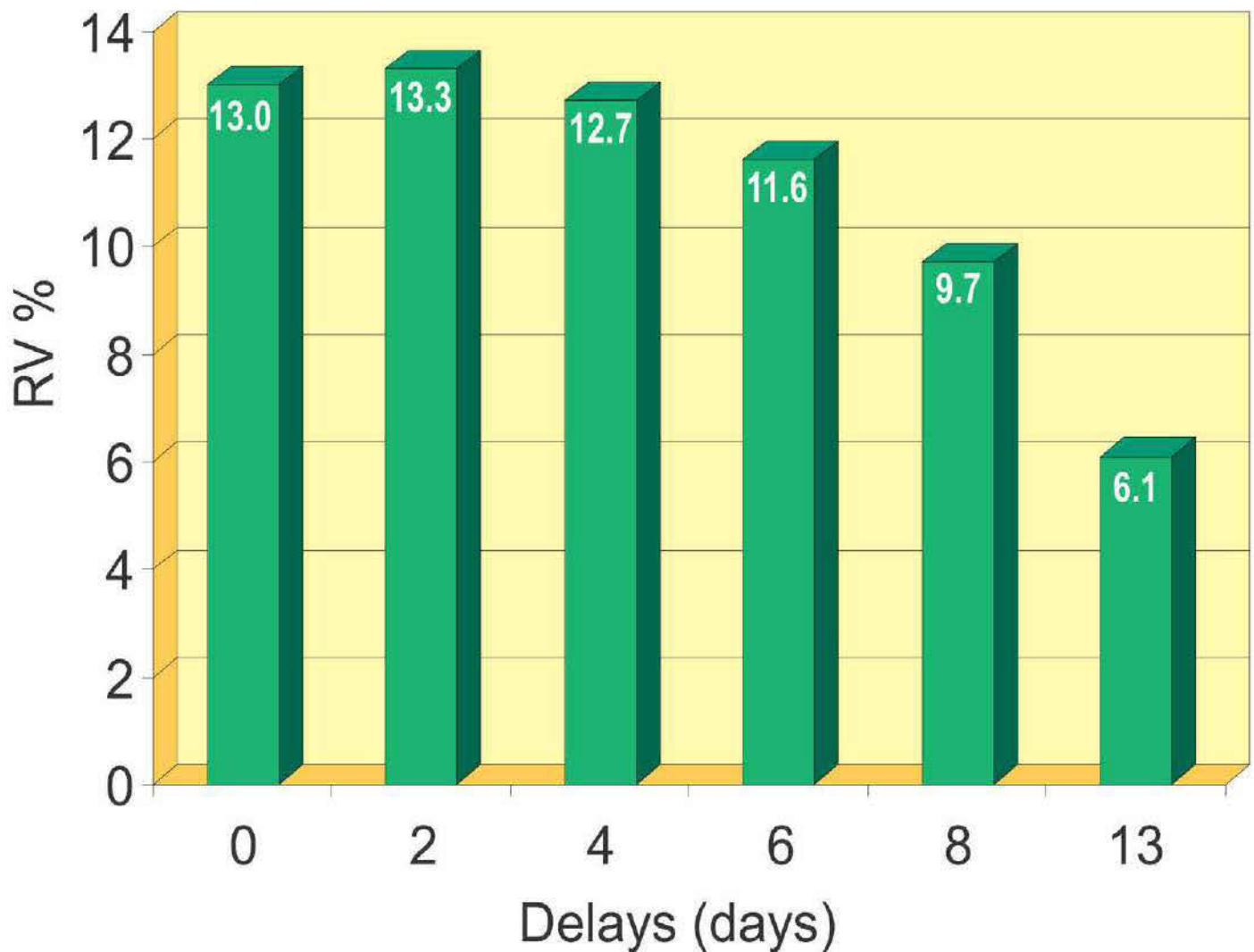


# Timing HARVESTING

- Different varieties should be cut at different times of the year.
- Plan to harvest your varieties at the correct time.



# Burn to crush delays



*Loss in RV due to increased  
burn to crush delay*

## To prevent losses in RV

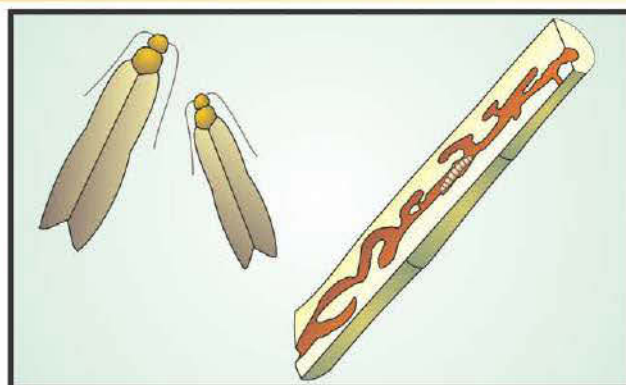
- Deliver cut cane to the mill quickly. Cane deteriorates quicker in hot weather.
- Do not leave burnt cane standing. Cut it immediately.
- Burn small areas.
- Send clean cane to the mill.



# HARVESTING

## ELDANA INFESTED CANE

- High priority cane, mill immediately.

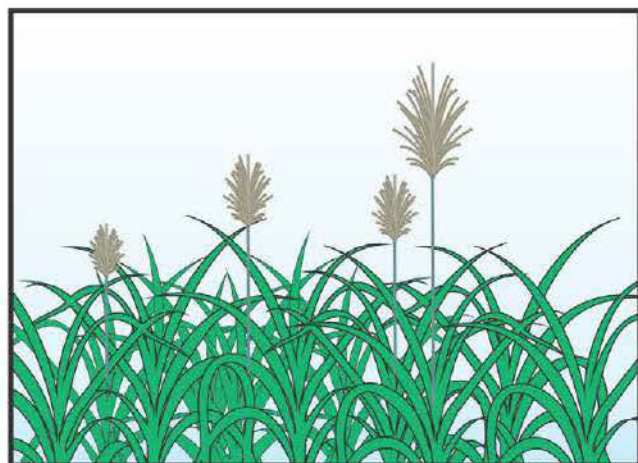


## FIRE CANE

- Must be cut and not left standing.
- Must be milled as soon as possible.
- Apply normal top-dressing and control weeds.

## DROUGHTED CANE

- Millable cane - Cut the worst affected fields first. Do not carry-over stressed cane.
- Unmillable cane (no eldana) - Leave standing. Apply 50% of the N when rain starts. Keep weed free.
- Unmillable cane (with eldana) - Burn, cut back. Apply top-dressing before rains.

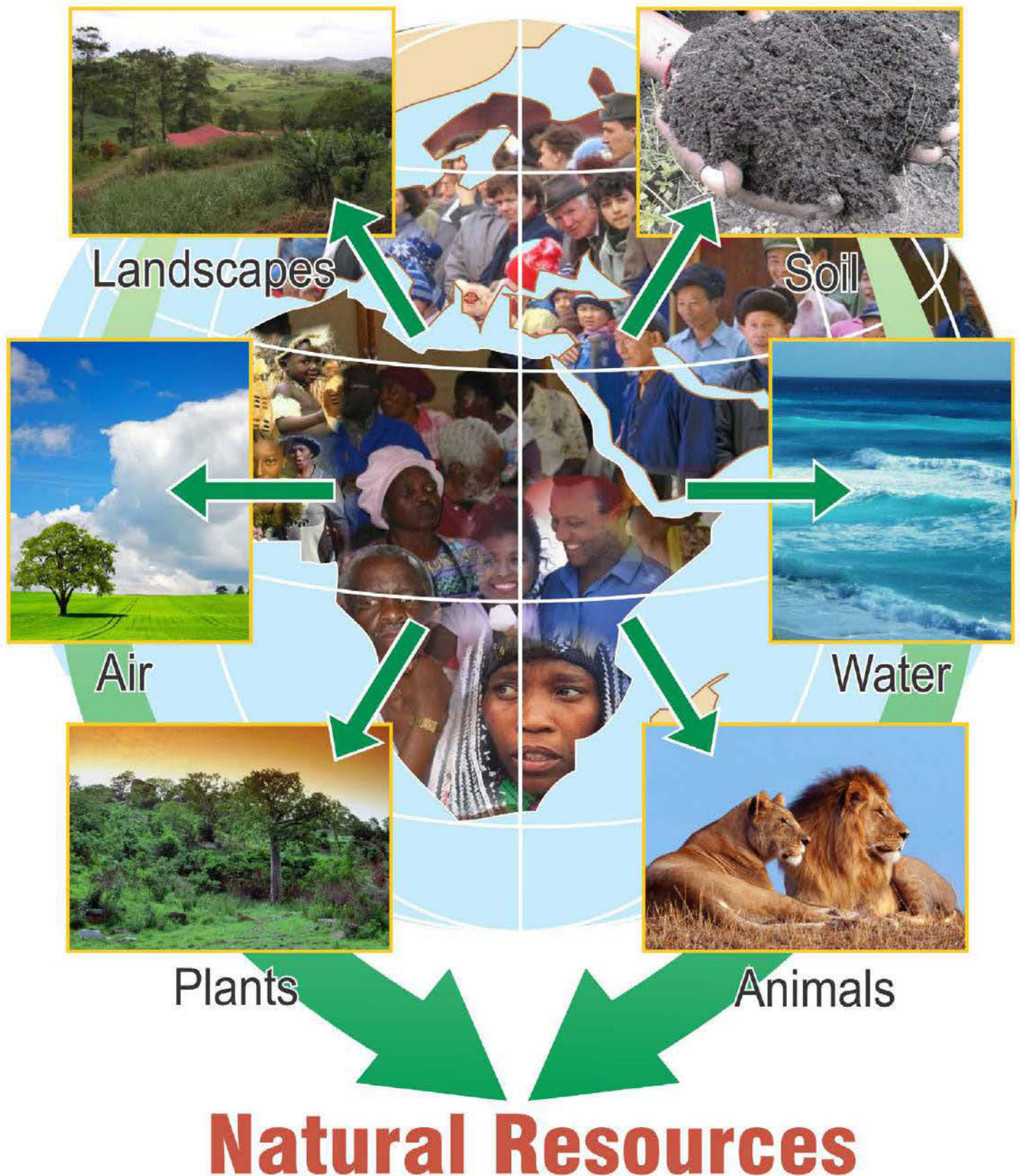


## FLOWERED CANE

- Mill before end of September.
- Do not carry over.
- Apply normal fertiliser top-dressing.



# What is the Environment?





# Managing our Natural Resources - Water

**How do we use water and what happens to water after we are finished using it?**



Irrigation



Industry



Irrigation



Recreation



Rivers, Dams and Sea



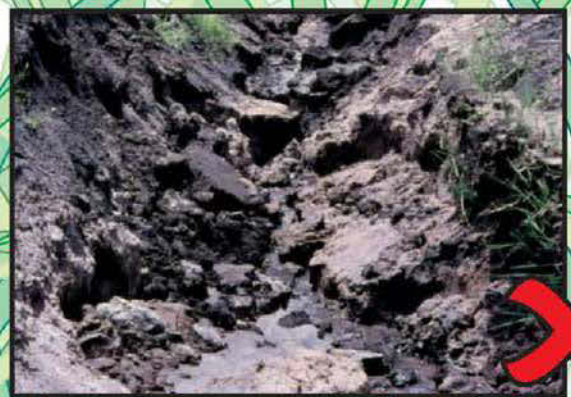
# Managing our Natural Resources - Soil

## Soil management practices

**Good**

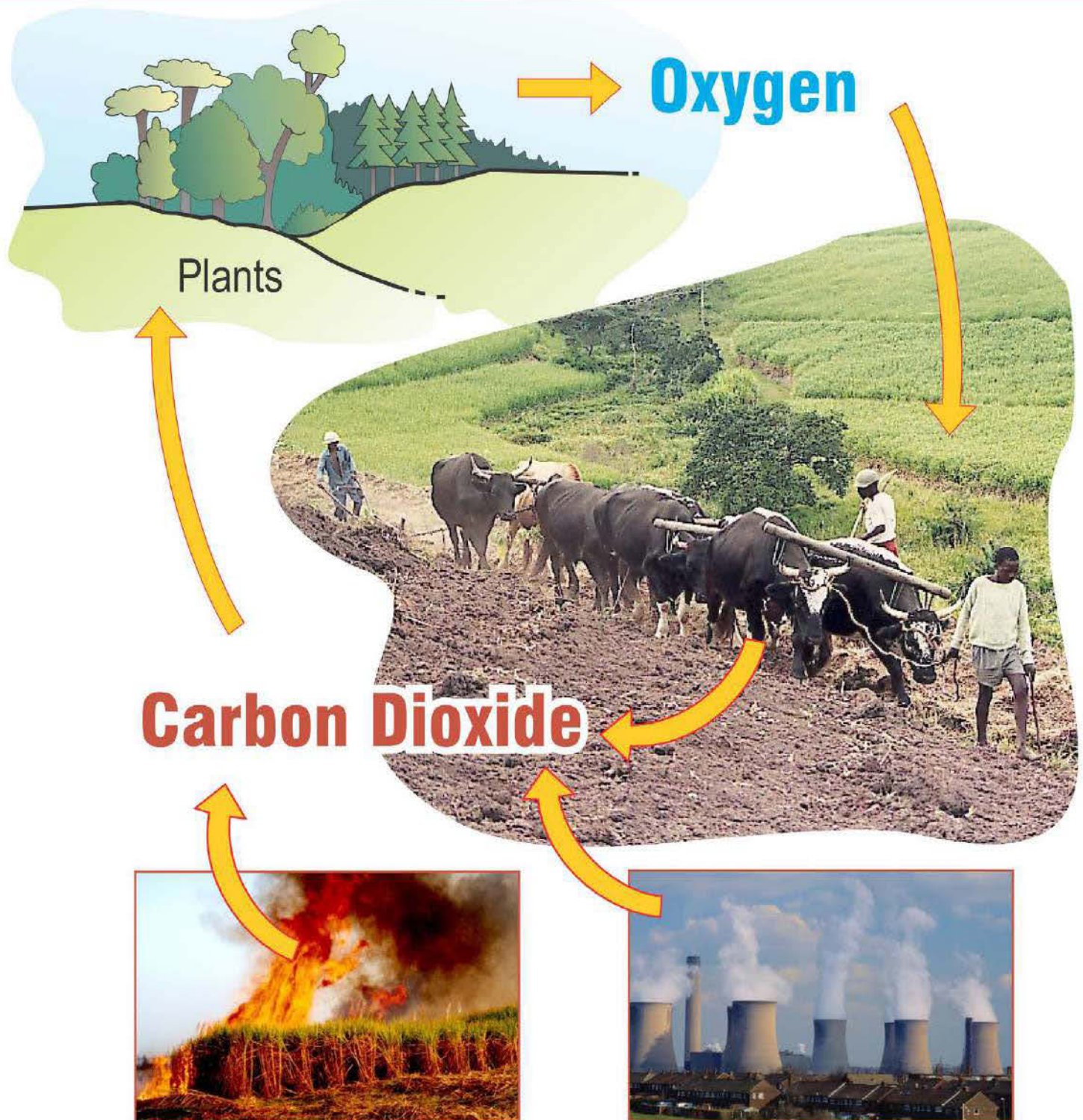


**Poor**





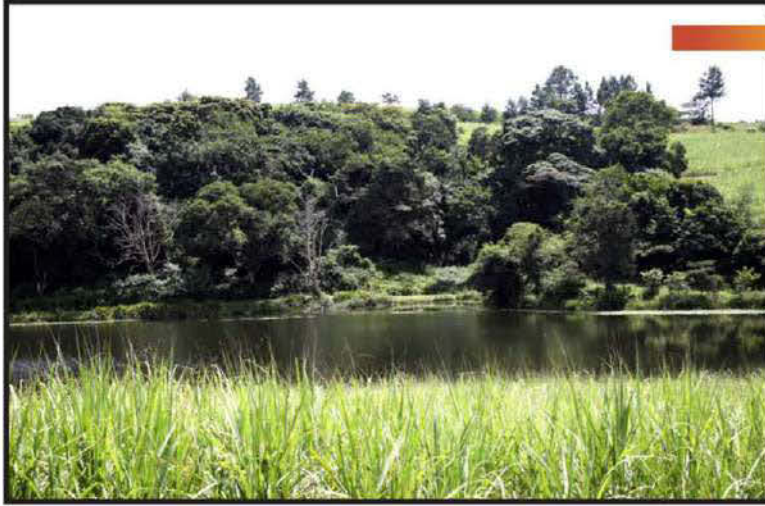
# Managing our Natural Resources - Air



Where **BURNING** is an unavoidable activity!



# People and the Environment



## Natural Landscape

- Wildlife
- Indigenous plants
- Scattered settlement



## Changing Landscape

- ✗ Loss of wildlife
- ✗ Loss of indigenous plants
- Growing settlements
- Agricultural activity
- Infrastructure e.g.. roads



## Altered Landscape

- ✗ No wildlife
- ✗ No indigenous plants
- Concentrated settlements
- Hub of activity
- Pollution
- Developed Infrastructure e.g.. roads



# Managing our Natural Resources - Legislation

## CONSTITUTION



Plants



Air



Water



Soil



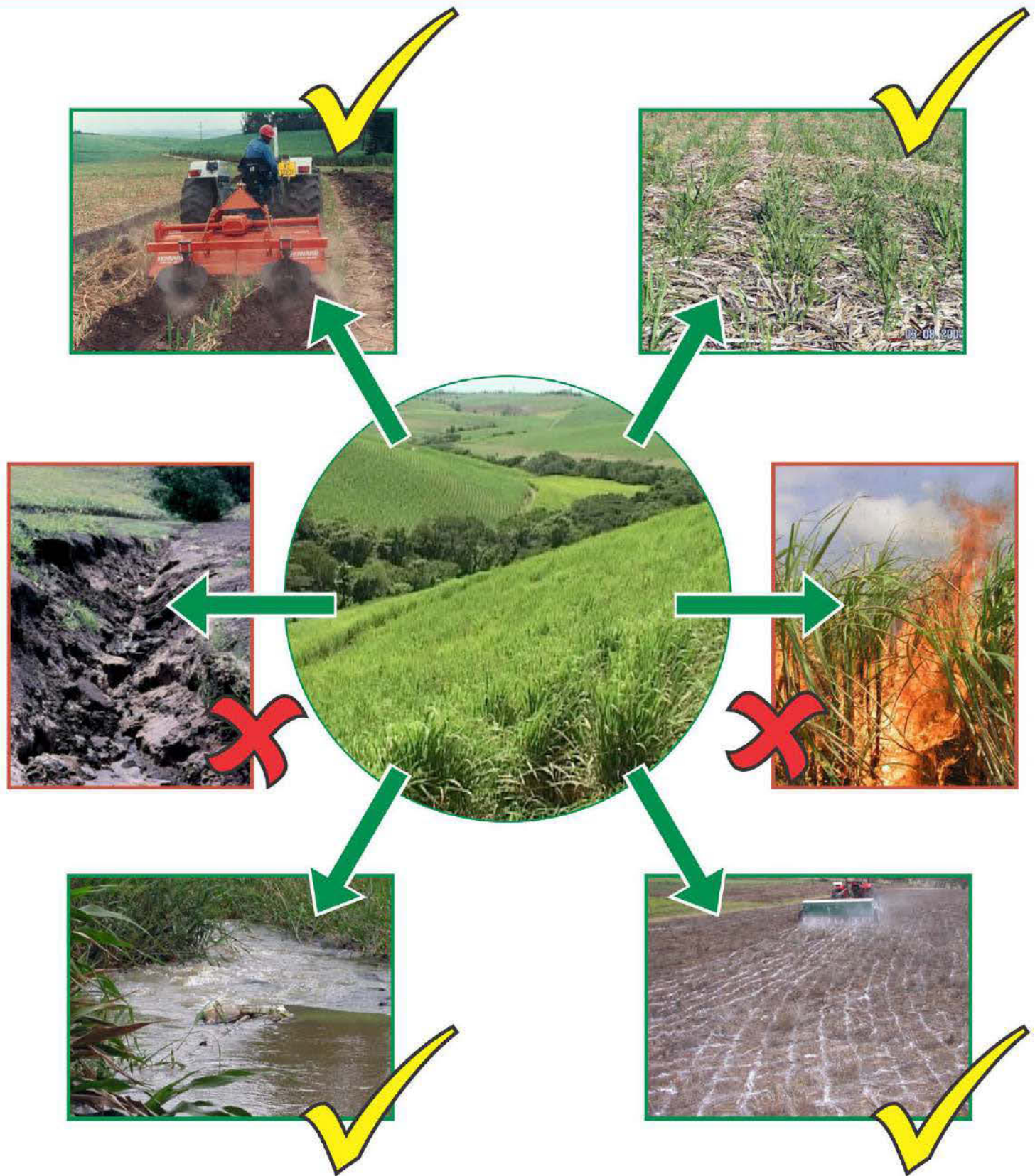
Animals

## RELEVANT ENVIRONMENTAL LEGISLATION

- National Forest Act
- The National Water Act
- Occupational Health and Safety Act
- The Conservation of Agricultural Resources Act
- The National Environmental Management Act (NEMA)



# How do farming practices impact on the Environment?





# Managing our Natural Resources

## Plants & Animals

### Beneficial plants and animals in cane farming

#### Wildlife



#### Plants





# Why look after Natural Resources?

**For food, water, shelter and sustainable agricultural production**





# Managing our Natural Resources

## Communication

### It is important to communicate.

#### Why do we need to Communicate?

To improve understanding and achieve joint action solutions towards environment management

#### Who do we communicate with?

All farming communities

- Growers
- Extension workers
- Contractors
- Support services
- Local communities
- Farm workers and families





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