Curverid Farming

Growing Season – Ensuring Crop Uniformity - Planting, Fertilizer, Weeding, Re-ridging and Topping

Losses from Field to Sales

Topping 18% | Sucker Control 22% | Reaping and Handling 8% | Barn Unloading 4%

Curing 28% | Storage 24% | Grading 18% | Presentation ?? | NTRM Penalties ??

1800 kgs in the Field

1000 kgs Sold

Price Loss ??

Leaf Counts and Barn to Plant Count Ratios

- The whole program has been linked to make every task simple and clear
- Seedbeds, plant counts, barn ratios and in fact everything that has been done to the crop has been carefully worked out. Even an inexperienced grower can follow the systems
- **Crop Inputs = Seedbed area = Plant Count = Barn Capacity = Success.**
- **DON'T PLANT MORE THAN YOU CAN CURE!!!!!!**

Are You Ready for the Rains?

Well hardened, disease and insect free plants of the "ideal seedling" size are essential for good establishment

Planting Rains

- Rainfall records and experience will determine the best planting time for good rain and follow up showers
- Good planting rains will fill up the furrows in the field and the box ridges will be wet up to the top. Growers must never rush to plant with early showers
- Digging into the ridge should show wet soil right down to the subsoil. The ideal is a good storm followed by rainy and cool conditions for a few days

The Ideal Seedling

- Seedlings must have been hardened for at least two weeks
- Advise the grower to **select** seedlings one by one and never to pull out handfuls
- The stem must be of at least pencil thickness
- 15 – 20 centimeters long
- No more than 8 – 10 leaves with a large, healthy root system
- No insect or disease damage

Seedling Selection and Uniformity

- The ideal seedling is the target every time one is selected
- It may not be possible to plant the the whole field with exactly the same size plants. By selecting seedlings, growers can ensure that adjacent seedlings are exactly the same
- Growers must select even seedlings from the beds as they pull. Seedlings at the start of planting may be bigger than the last part but they should be uniform across the field

Planting the Crop

- After a good planting rain has fallen the grower must select his seedlings and pull and plant as quickly as possible
- Growers should pull and plant into the night to get the field finished. **The field must be completed within one day**
- Never plant small or weak plants

Never bend the stem or roots when planting

There is only one chance to plant the crop – get it right first time

Uniformity and Stands

- The ideal seedling should be carefully selected
- Seedlings should be matched to ensure uniformity across the field
- Ridges and plant spacing must be the same as recommended
- Insist on high standards at planting – growers often panic and rush the task. Effective training will ensure that all growers follow standards and achieve good establishment

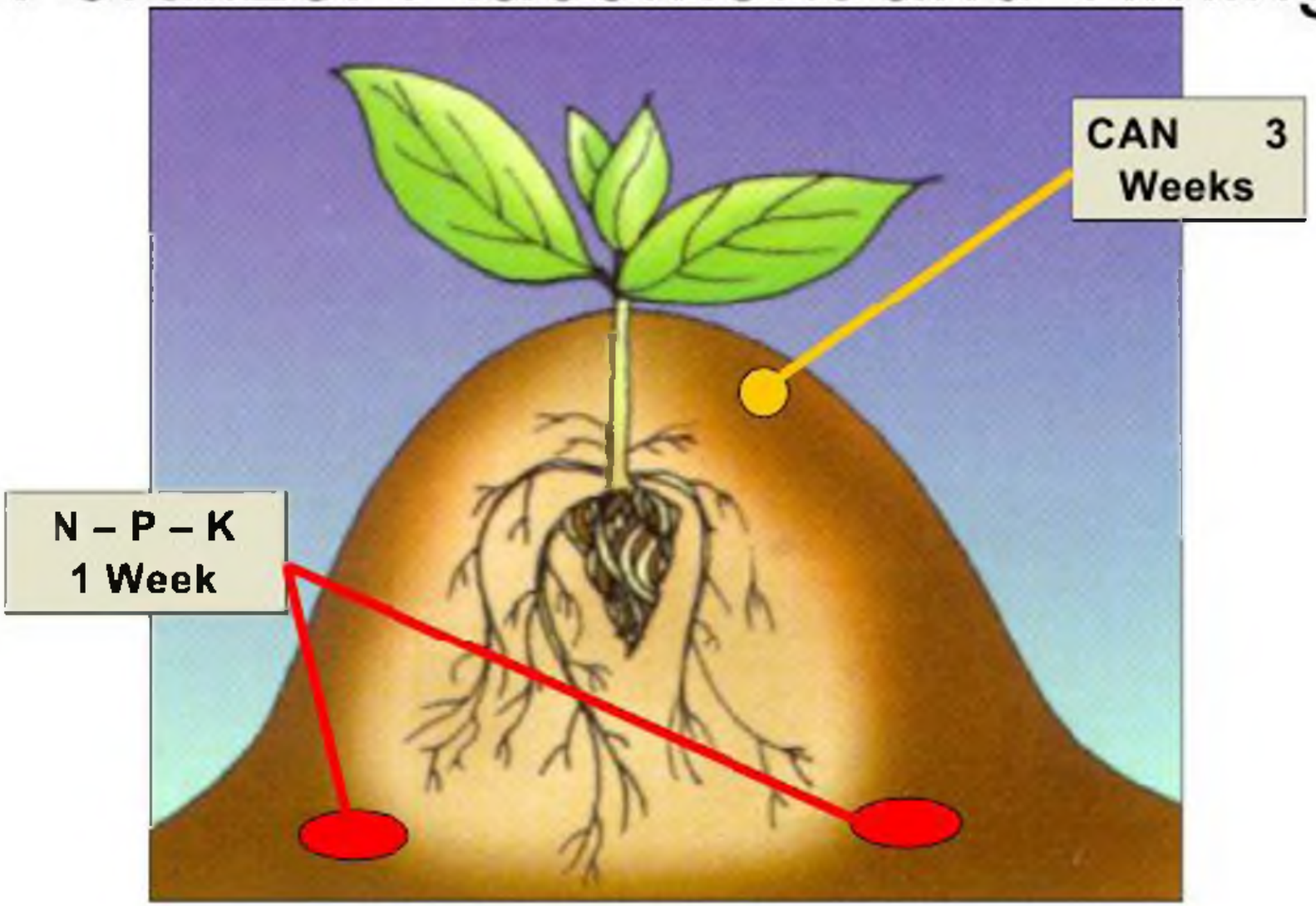
Bad planting can never be corrected

Bad Planting = A Bad Field = Bad Yields and Poor Quality = Failure and Bad Debt

What Crop Uniformity Means

- Every task we have carried out on the crop has been aimed at achieving a uniform crop
- This is critical with flue cured crops because of how the crop will be reaped
- An uneven field will be a problem for the whole season. A uniform crop will make every single operation simple and give a very good result
- **We must get it all right from the start of the season**

Fertilizer Placement and Timing



Fertilizer Application – Timing is Critical

Late Application

Early Application

Any delay will seriously affect the growth of the crop and will never be recovered

Weeding

- Within a few days of planting weeds will start to grow. Never let them get big
- Weed the crop often and kill weeds when they are small and cannot cause damage
- Late weeding will mean lost fertilizer flattened ridges and damage to young plant's root systems
- The rule must be to weed regularly but lightly and disturb the ridge as little as possible

Hand Insect Control

How?

1.Early

2.Regular

3.Careful

4.Thorough

Why?

1.Safe

2.Residues

3.Easy

4.Cheap

Re-ridging

- As the crop is starting to grow out and the leaves are expanding the last cultivation and re-ridging should take place
- Soil must be pulled up to create a large ridge that will help the plant survive heavy rains
- All remaining weeds will be covered and soil will be aerated and provide a fresh area for root development
- Care must be taken not to damage or cover any leaves

When to Start Topping

- Do not look at plant height, count the developing leaves to ascertain topping time and leaf number
- If 15 % of the plants are ready the operation can start. Over 60 % of the field ready at topping stage can be achieved with uniform crops
- Well grown crops should be topped to standard leaf counts. Weak crops may require reduced leaf numbers

The Most Important Operation of The Season

- Topping is the single most important operation of the season and determines quality and yield
- Remove the bud as soon as it can be reached without damaging the other leaves
- Count the leaves regularly to ensure even topping height
- By counting the leaves, the topping will take place at exactly the right time and leaf number. All plants should be identical

Ideal Topping

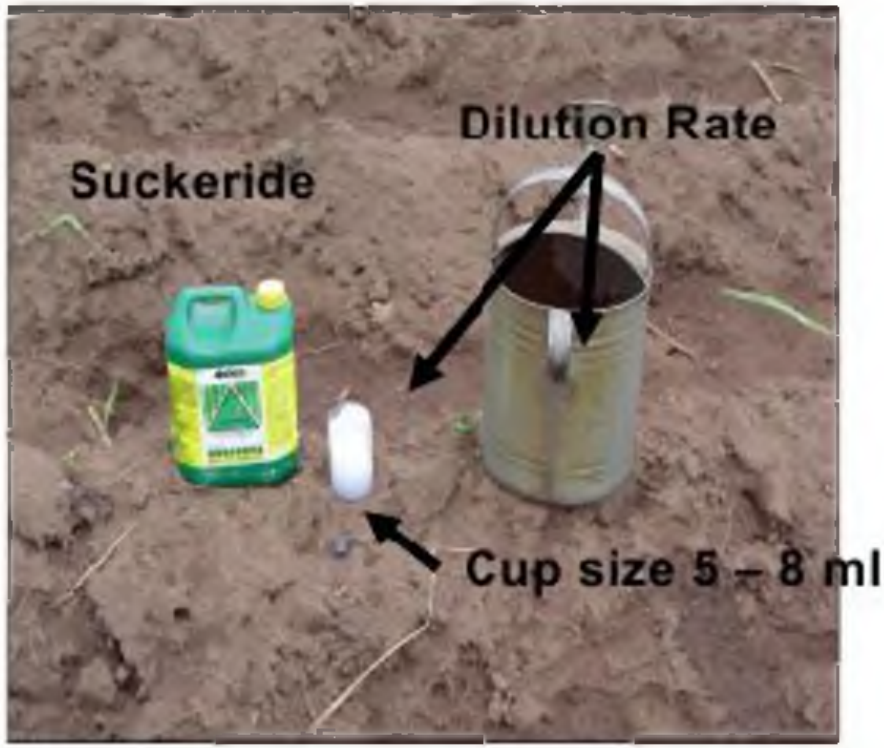
- Bud topping
- Remove the Apical bud when it is approximately the size shown here

Crop Response and Growth

- The early topping will cause a dramatic change in the plant
- Over 25 % new root growth will occur almost immediately. This means all applied fertilizer will be taken up
- The plant will green up and massive leaf expansion will take place
- Early and low topping also improves the plant's ability to resist pests and diseases through the healthy root system and clean leaves

Chemical Sucker Control

- With early topping, vigorous sucker growth starts and chemical control measures are essential
- Growers must apply the chemical at topping time and that correct measurement and mixing takes place
- Suckerides must be used as soon as possible after mixing and should be kept agitated
- The correct cup size for application must be used



Suckeride Requirements

- The run-off at the base of the plant will clearly show the right quantity to use
- In most cases a 5 ml cup will be adequate but well grown out, tall crops may need up to 8 mls
- Apply exact requirements. We must always avoid chemical residues on leaves and soil

Application Of Suckeride

- Because of the low height of the early topped plants, very small amounts of suckeride are applied
- Application should be split on to different leaves at the top of the plant to ensure all axils are reached with the suckeride
- The top leaves should be held slightly apart so the chemical can be accurately applied
- Over application must also be avoided

Our Target – A Crop with Quality and Weight

- Following the recommendations should ensure a crop that looks like this
- Easy to reap
- Easy to cure
- Easy to grade
- Profitable

ALLIANCE One

The Planting and Growing Season

Brush Baker - Regional Agronomist Africa

All Recommendations given today are the same as provided by

A.T.T.T

Alliance One

is giving our growers additional information in support of this to improve their results

Early Losses

Insect Control 12%

Weed Control 64%

Fertilizer Timing and Placement 22%

Seedling Quality 19%

Planting and Uniformity 12%

Land Preparation 23%

Firewood ??

Barn Number and Condition ??

NTRM Control ??

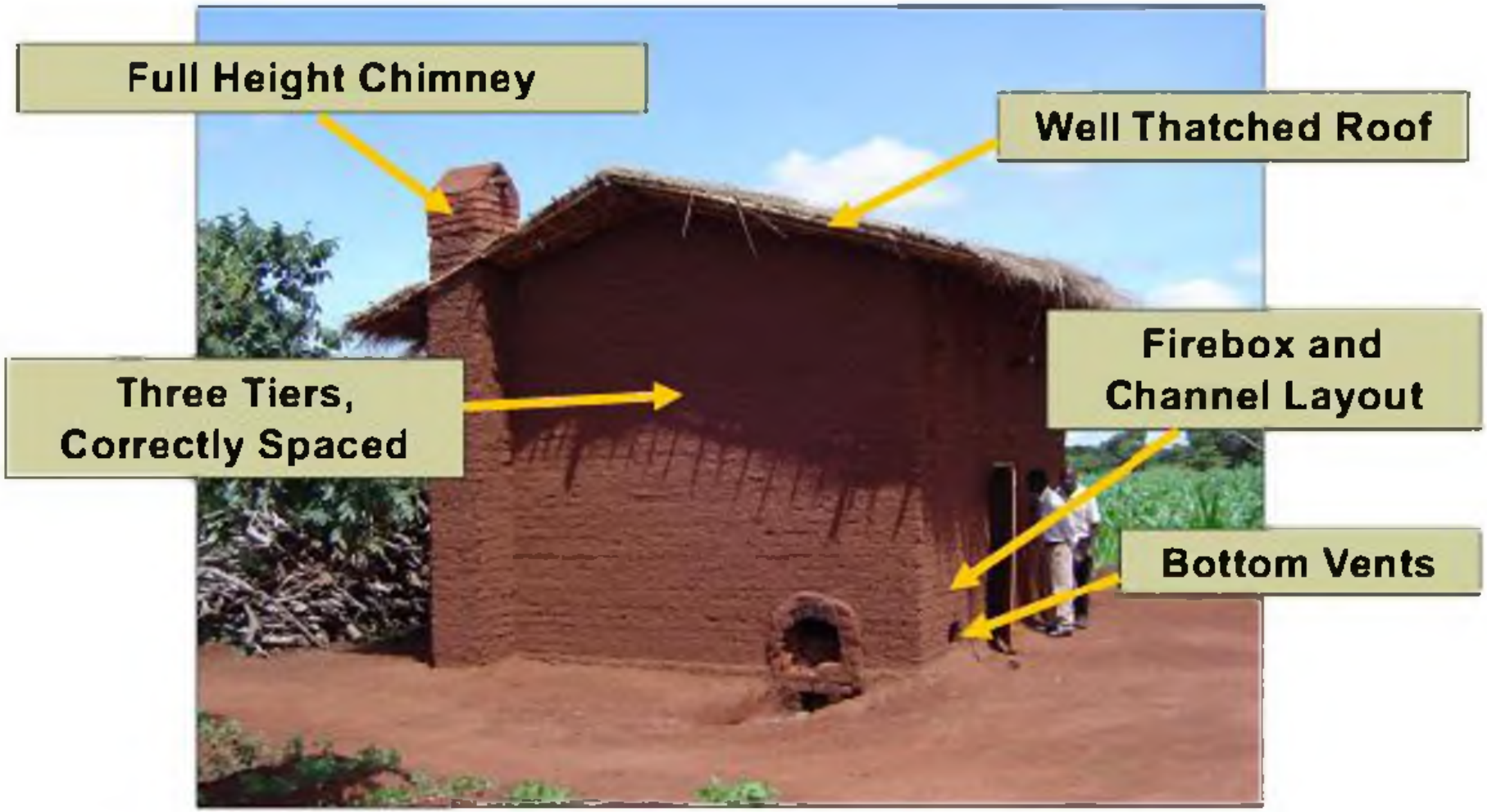
Storage Shed ??

Each Field Requires Two Barns

8000 plants x 2 leaves/week/Reaping @ 80 leaves per string = 200 strings.
One reaping is required every 6 - 7 days

Barn turnaround – fill, cure, condition and empty is 8 - 10 days.
Two barns, each filled on alternate weeks is required

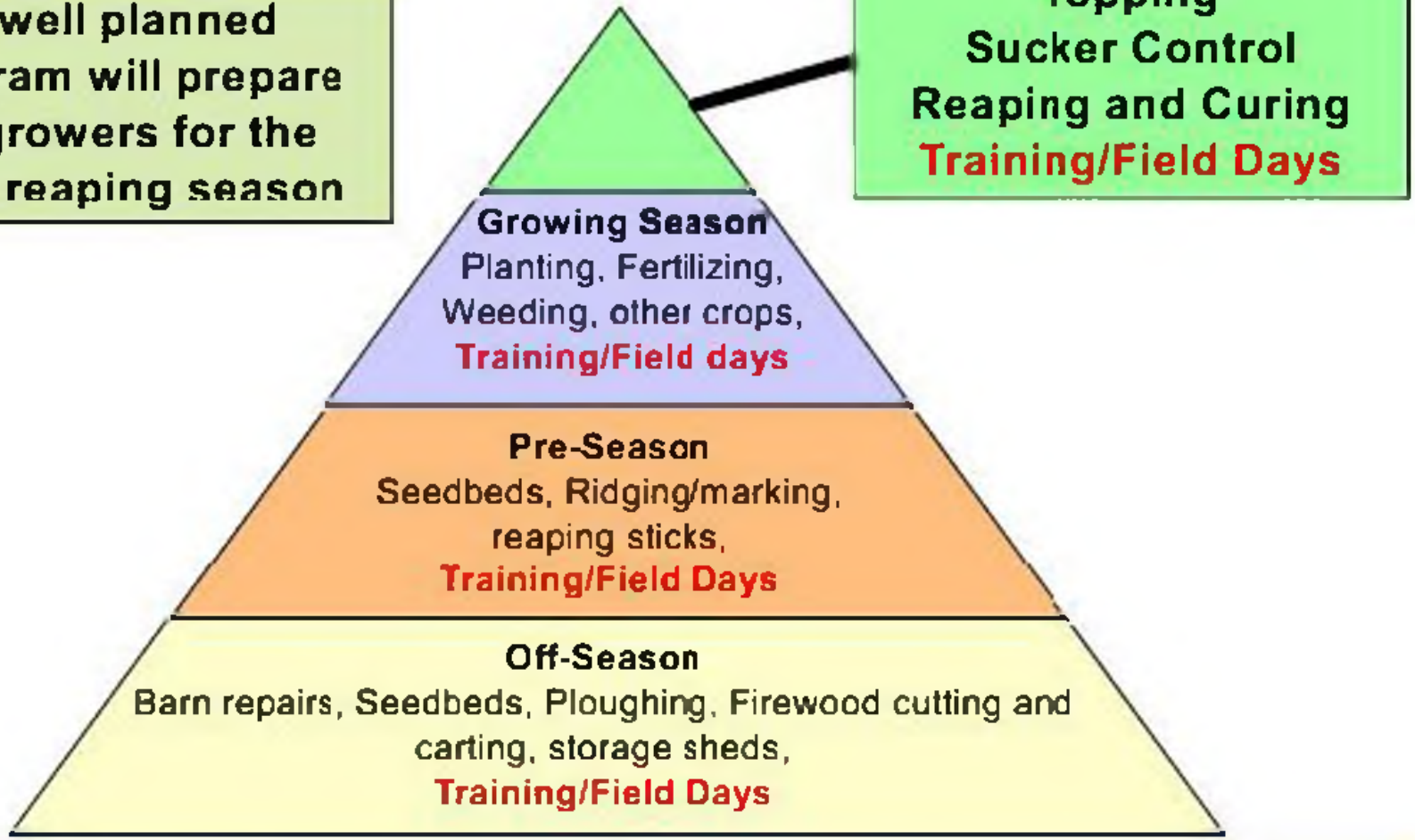
Barn Requirements



Firewood Savings and Better Quality

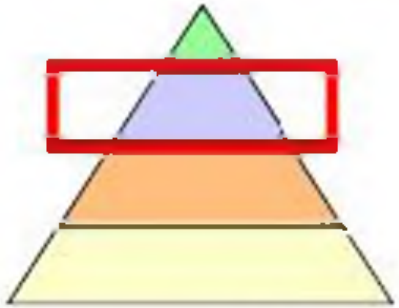
Early Planning and Programs

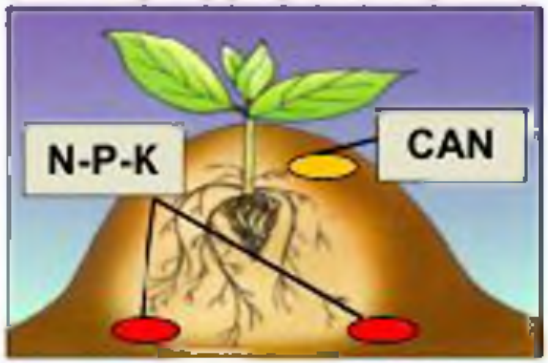
A well planned program will prepare all growers for the busy reaping season



Training and Programs for Success

The Planting Season





Resetting – The Best Seedlings

Spacing at 6 x 6 cms

Resetting – Selection

Select seedlings of exactly the same size, Never reset different sized seedlings

Insect Control – Decis Tablet Application

- Decis tablets are a good option because this is a safe chemical and will not leave ary residue on the crop when correctly used
- Mix a half tablet per 10 liter watering can
- Apply two cans of mixture per bed
- Apply this chemical if insect damage is ncticed
- A further application may be required if insects are not controlled at hardening time

Confidor 70 WG Application

- Confidor 70 WG recommendations are as follows -
- Apply as a drench abou: 10 days before the expected planting rains
- Mix 5 grams (1 x 5 gm sachet) per 20 liters water. This is half a sachet per 10 liter can
- Apply 4 cans per bed. This should be done before watering to ensure the chemical is washed into the root zone

Hardening and Clipping

- Hardening of all seedlings is very important
- Seedlings should be hardened for at least two weeks before transplanting. Clipping may also be required to even out and hold back the plants
- Hardened seedlings will survive in harsh planting out conditions. Soft seedlings will not survive hot weather after transplanting and major losses in stands will take place
- Make sure growers wash hands and tools when clipping

Always wash hands before entering the nursery
Never smoke or take snuff in the seedbeds

Good Quality Seedlings

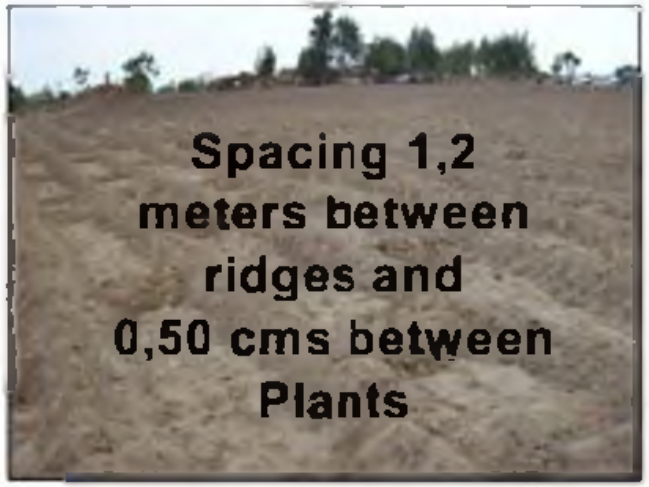
- Seedlings should have been hardened for at least two weeks
- Growers must **select** seedlings one by one and never pull out handfuls
- The stem must be of at least pencil thickness
- 15 – 20 centimeters long
- No more than 8 – 10 leaves with a large, healthy root system and no insect or disease damage

Reset seedlings will be easy to select and the majority of them will be good quality

Planting the Crop

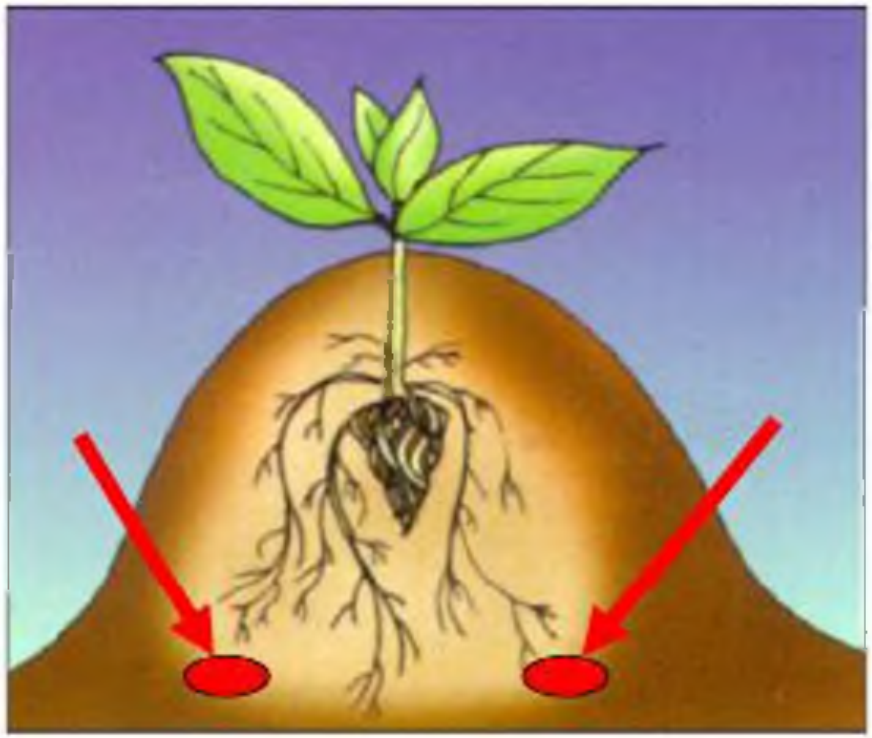
- After a good planting rain has fallen the grower must select his seedlings and pull ard plant as quickly as possible
- Growers should pull and plant into the night to get the field finished. **The field must be completed within one day**
- Plant seedlings on the marker and press the soil firmly down to force out all air. Depth must be right up to the heart
- Never plant small or weak plants
- Never bend the stem or roots when planting

There is only one chance to plant – get it right first time



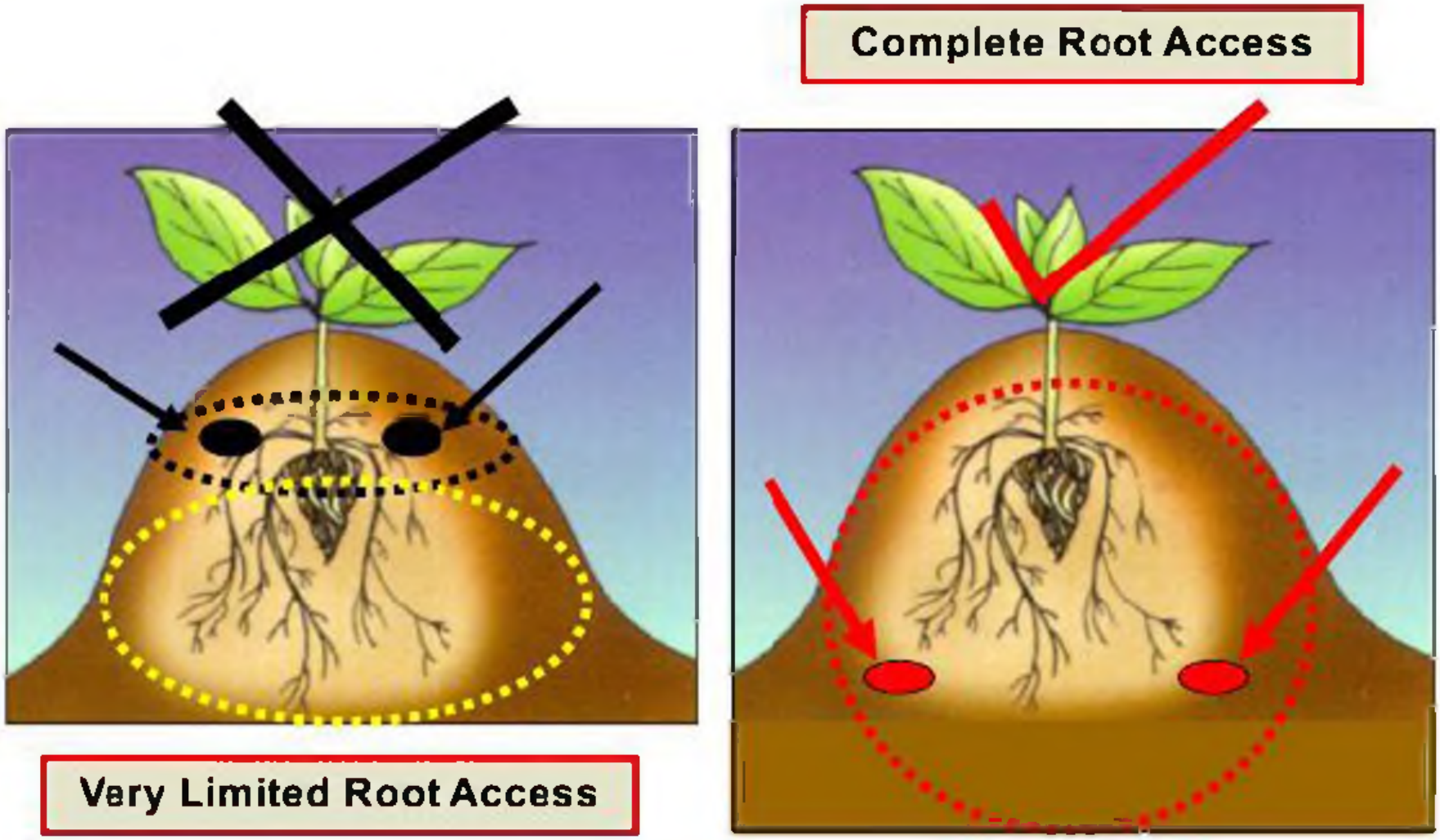
N – P – K Fertilization

- Fertilization must be done as soon as possible after planting.
- Fertilizer must be applied Either side of the plant in the centre of the ridge. Open the hole with a hoe, apply the fertilizer and close again
- Dig close to the plant but do not damage or disturb it
- Shallow application will result in slow and incomplete uptake by the plant



Fertilizer is our most expensive input - do not waste it through poor or late application

Correct N – P – K Placement

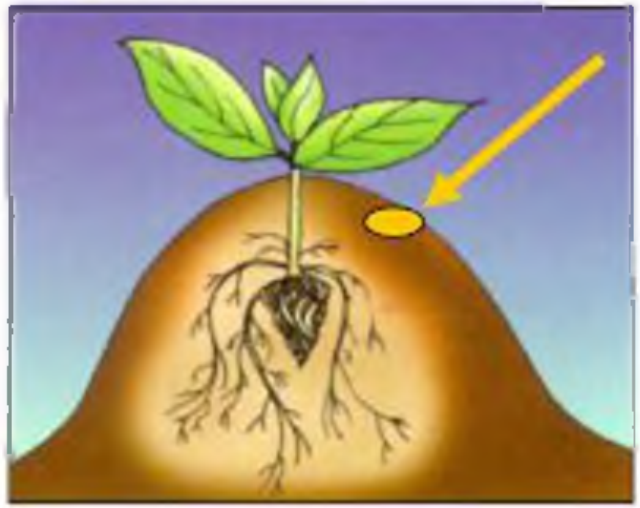


Weeding

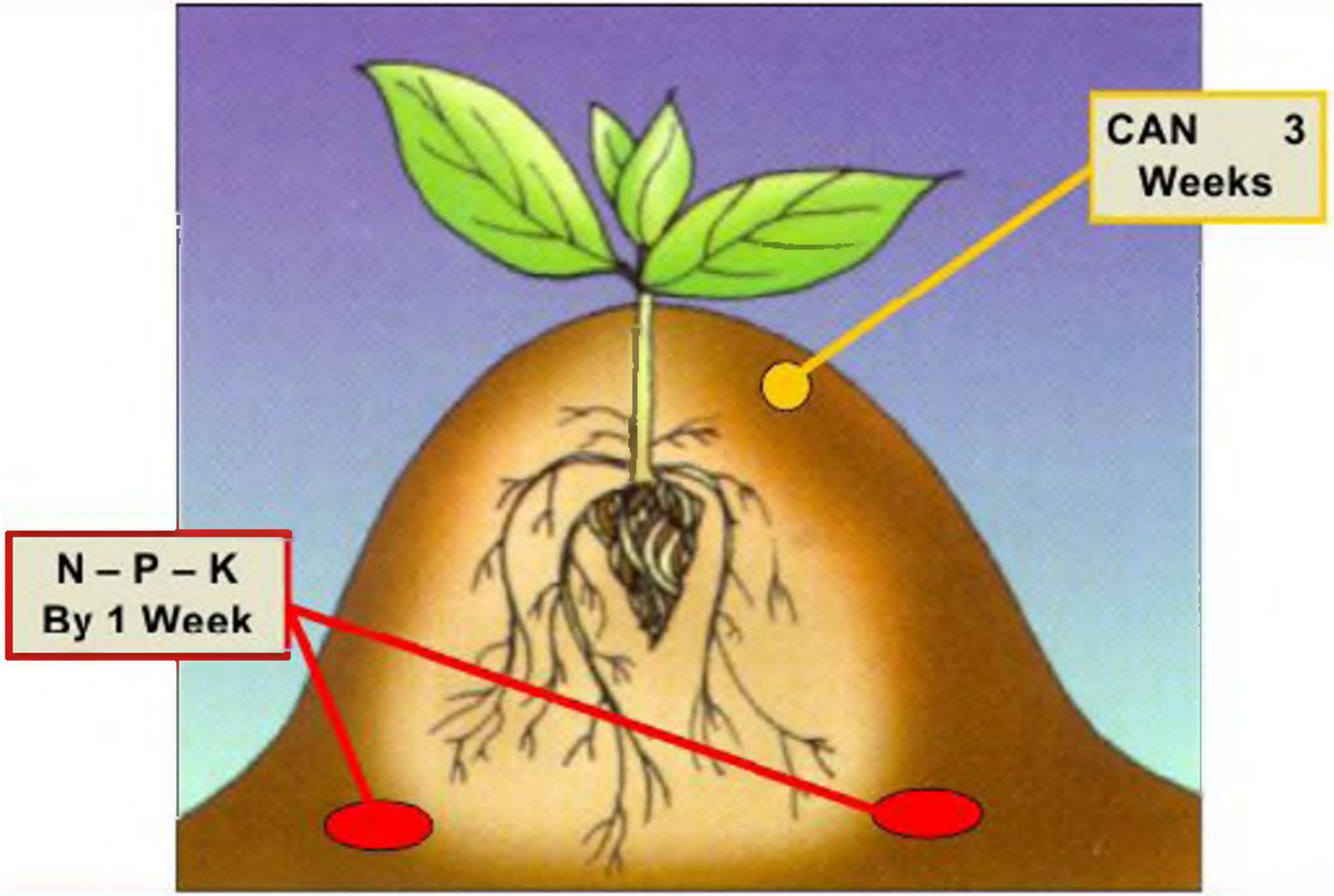
- Within a few days of planting weeds will start to grow. Never let them get big
- Weed the crop often and kill weeds when they are small and cannot cause damage
- Late weeding will mean lost fertilizer flattened ridges and damage to young plant's root systems
- The rule must be to weed regularly but lightly and disturb the ridge as little as possible
- Weed free crops are **Good Agricultural Practice**

Top Dressing

- The crop will grow very fast at this time of the season and any top dressing must be applied three weeks after planting
- A hole should be made a hand width from the plant on the side of the ridge and the fertilizer placed into it with the right cup
- Never throw the fertilizer onto the ridge it may burn the plant or be washed off by rain
- Make sure the crop is totally weed free before applying the top dressing



Fertilizer Placement and Timing



Crop Chemical Management

- Only apply chemicals that have been recommended by ATTT
- Chemicals are expensive and their use must be limited
- Apply all chemicals exactly as advised ard never use extra or apply later than recommended
- Chemicals from other crops must never be applied to tobacco

Hand Insect Control

How?

1. Early
2. Regular
3. Careful
4. Thorough

Why?

1. Safe
2. No Residues
3. Easy
4. Cheap

Chemical Insect Control

- Confidor will have been applied which will provide total aphid control until after topping.
- Leaf eaters may cause damage and should be easily controlled by regular hand picking
- If necessary growers may be advised to treat crops with Decis Tablets
- Mix a half tablet per 10 litre watering can
- Apply with a knapsack sprayer or splash over the growing point with a number 16 cup or the "paintbrush" method
- Make sure the small leaves on the growing point are well covered

Re-ridging

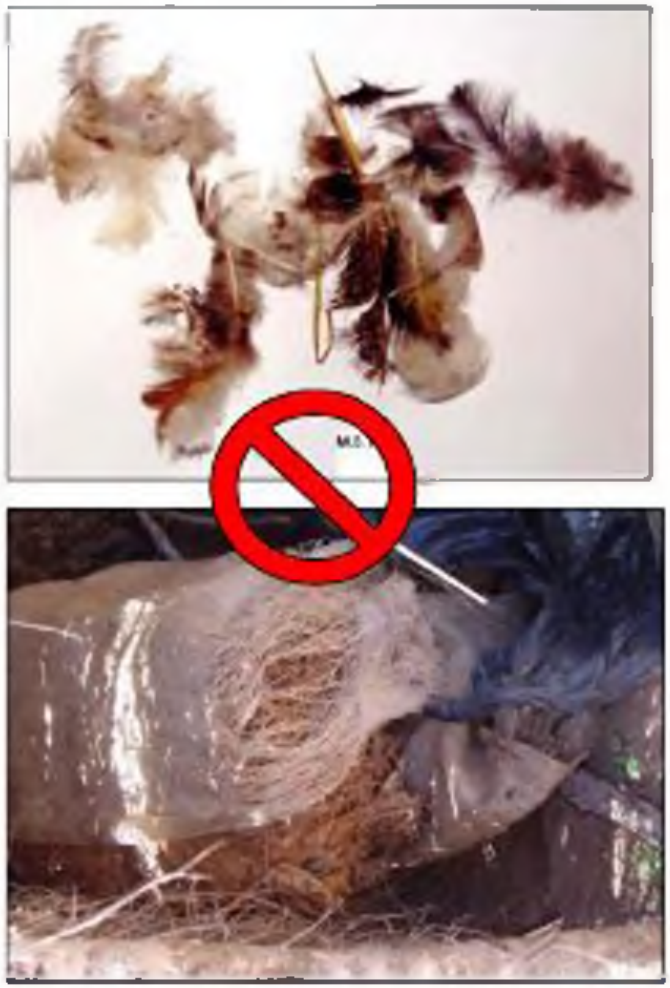
- As the crop is starting to grow out and the leaves are expanding the last cultivation and re-ridging should take place
- Soil must be pulled up to create a large ridge that will help the plant survive heavy rains
- All remaining weeds will be covered and soil will be aerated and provide a fresh area for root development
- Care must be taken not to damage or cover any leaves

Food Security - Other Crops

- All growers should be encouraged to produce other crops which can be grown together with tobacco
- Food crops such as maize, groundnuts and beans will help to provide the grower with food security and additional income
- We must advise our growers how to include other crops in the program and show them **Good Agricultural Practices** for these crops

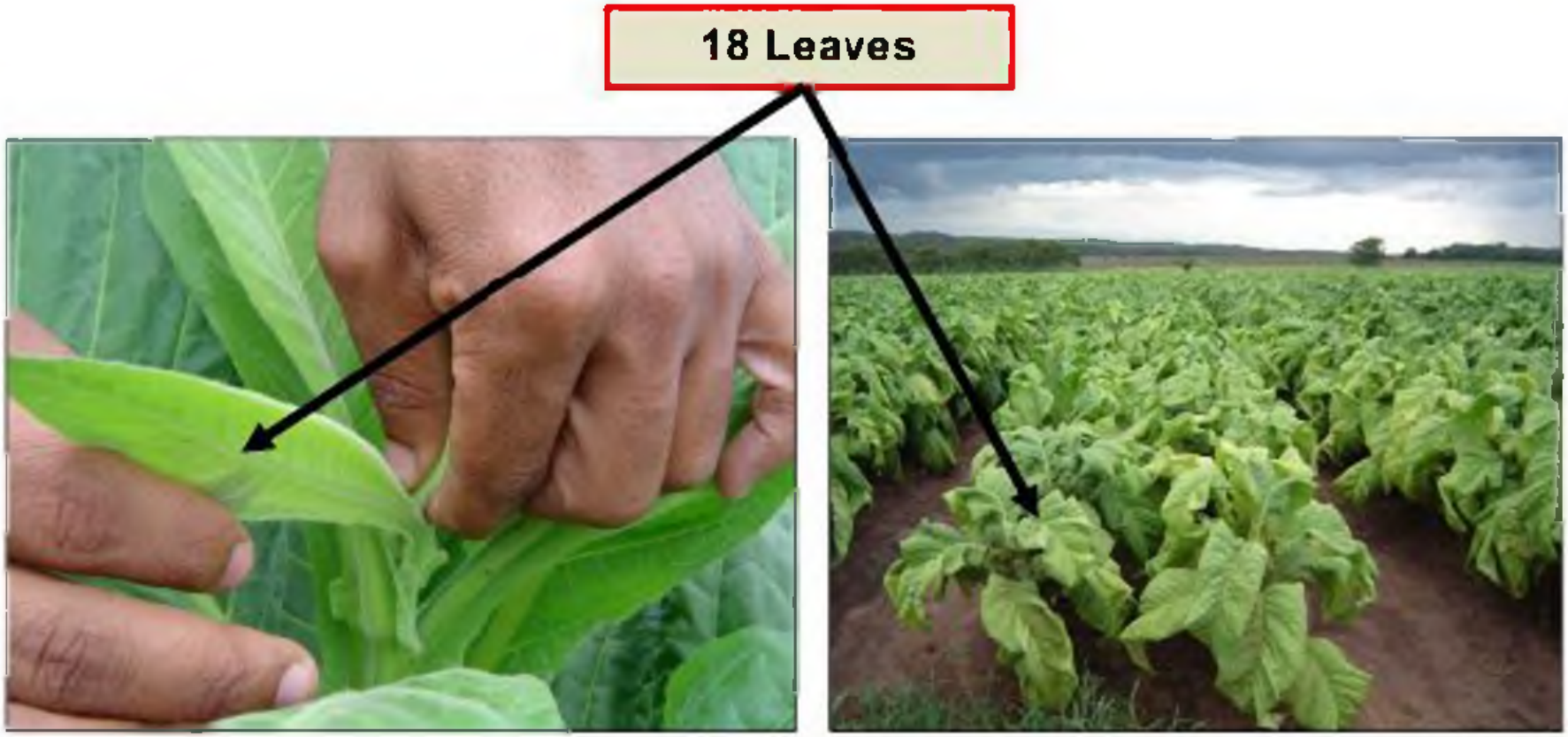
NTRM Control

- NTRM awareness must be a part of every single operation we carry out
- Contamination of our tobacco by feathers and plastic must be stopped
- Strict buying controls will be enforced to prevent the purchase of any contaminated tobacco
- **Stop the problem where it begins – with the grower**



Topping

Leaf Development after Topping



Late Topping, Too Many Leaves

Early Topping at 18 Leaves

Late and High vs Early at 18 Leaves

Early Topping for Better Yield and Quality

Yamaotea Application

Alliance One is not just a buyer of tobacco.

We are providing our growers with the best agronomy service in the Industry

(Good Agricultural Practices) will help **Growers** to make better returns that improve their living conditions and create wealth within their communities

ALLIANCE One

5. Growing Season – Planting Operations, Chemical Applications, Top Dressing and Weeding/Re-ridging

P.G. Baker - Regional Agronomist Africa

Field Days and Grower Training

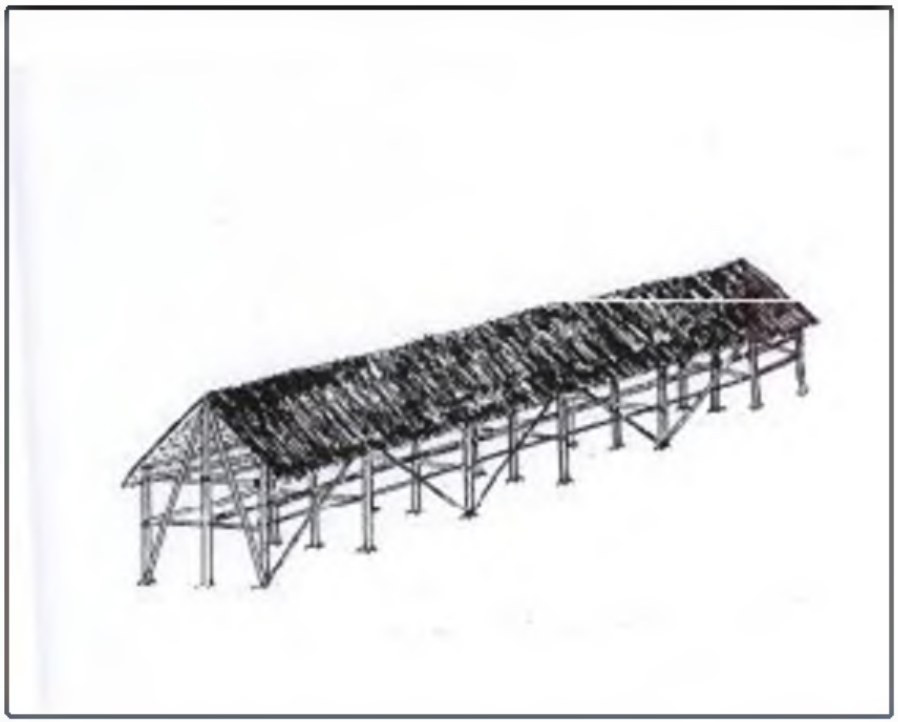
- Growers must be provided with effective training and instruction on planting operations well in advance of the planting rains
- All sections of the Alliance One program make it easy for the grower to follow each step
- Planting is an operation that cannot be repeated – there is only one opportunity to do the job correctly
- Keep training and field days timely, simple and effective

Input Requirements

- The grower's performance will be as good as the back up you give them
- All inputs required for planting operations must be with the grower, ready for use
- Late deliveries of fertilizer and other inputs must never be allowed to ruin the crop potential. Do not fail your growers
- "Without the right tools the job cannot be done."

Are You Ready for the Rains?

Barns must be ready for curing, built to the correct specifications and matched to the field and plant counts



Are You ready for the Rains?

Flue cured growers should have adequate firewood cut, stacked ready at the barns

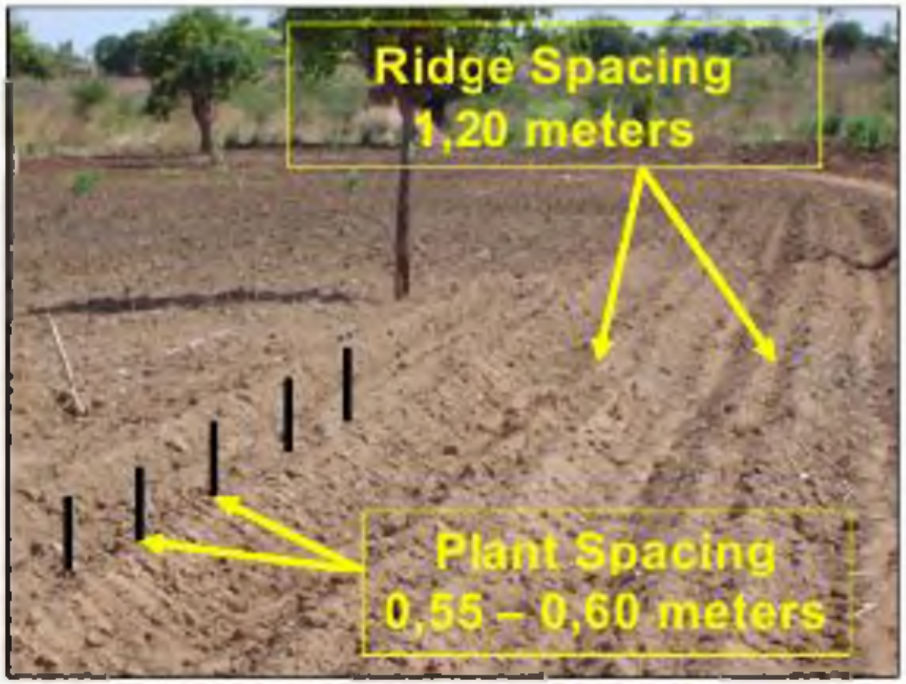
A storage shed will prevent losses and all flue cured and burley growers should try to provide a secure building

Are You Ready for the Rains?

Well hardened, disease and insect free plants of the "ideal seedling" size are essential for good establishment

Are You Ready for the Rains?

Fields should be pre-fertilized and ridged, with plant stations marked clearly and tie ridges every three meters



These tasks should be completed before the first rains to achieve the best yields and quality and avoid disease and insect problems

Programs Completed and Ready for the Rains!

Good Agricultural Practices will make sure Alliance One growers are ready for the first rains

Planting Rains

- Rainfall records and experience will determine the best planting time for good rain and follow up showers
- Good planting rains will fill up the furrows in the field and the box ridges will be wet up to the top. Growers must never rush to plant with early showers
- Digging into the ridge should show wet soil right down to the subsoil. The ideal is a good storm followed by rainy and cool conditions for a few days

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Planting the Crop

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- Plant seedlings on the marker straw and press the soil firmly down to force out all air. Depth must be right up to the heart
- Never plant small or weak plants

Never bend the stem or roots when planting

There is only one chance to plant the crop – get it right first time

Uniformity and Stands

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- Ridges and plant spacing must be the same as recommended
- Insist on high standards at planting – growers often panic and rush the task. Effective training will ensure that all growers follow standards and achieve good establishment

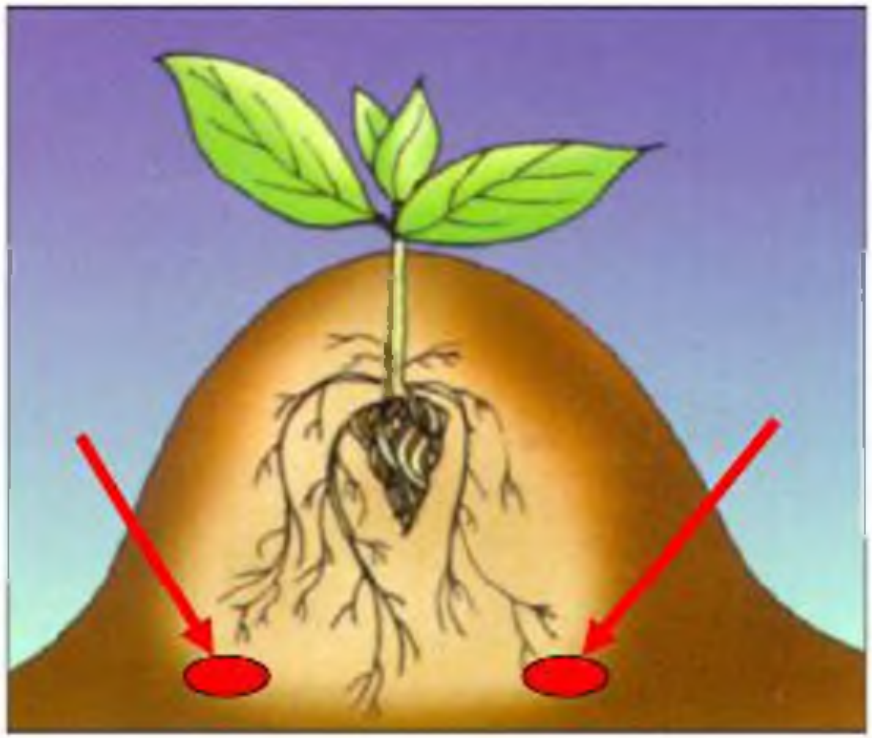
Bad planting can never be corrected

Bad Planting = A Bad Field = Bad Yields and Poor Quality = Failure and Bad Debt

Post Planting Fertilization – A Second Option

- Pre-planting fertilization is clearly the best option. Some countries may be forced to fertilize after planting because of grower control problems
- In this case fertilizer must be applied level with the plant and deep into the side of the ridge. Open the hole with a hoe, apply the fertilizer and close again
- It is critical to apply fertilizer within a few days of planting – any delay will seriously affect yield and quality

Dig down level with the plant into the side of the ridge



Apply the fertilizer into the hole and cover well with soil

Fertilizer Application – Timing is Critical

After Planting

Pre-Fertilized

Any delay will seriously affect the growth of the crop and will never be recovered

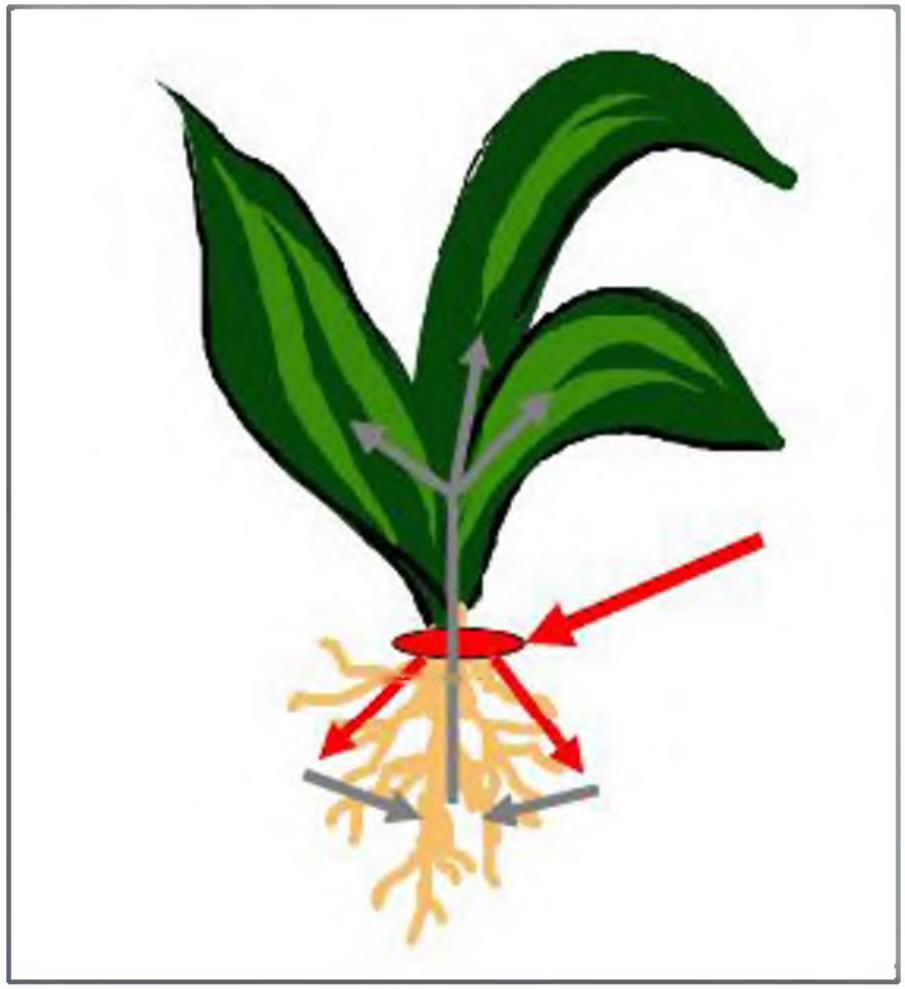
Confidor SL 200 Field Application

- This application should be cupped on within a week of planting ideally during wet weather
- Mix 1 x number 12 cup per 10 liter watering can
- Apply 1 x number 30 cup per plant onto the stem at soil level
- It should not be applied to the leaves and is only taken up through the roots. A knapsack sprayer should not be used to apply this chemical

Observe normal chemical precautions

Confidor - Application and Uptake

- Confidor should not be applied to the leaves. It is only taken up through the roots.
- A knapsack sprayer should not be used to apply this chemical
- Apply only the cupped treatment to the plant stem, exactly as recommended
- Because it is taken up through the root system it is ideally applied when rain is likely to fall

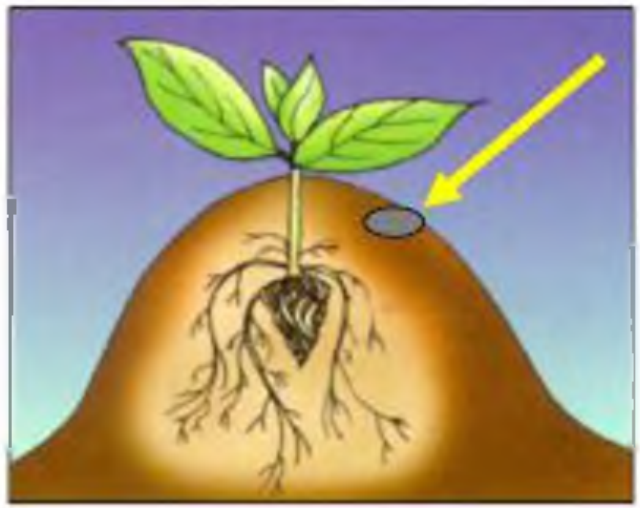


Weeding

- Within a few days of planting weeds will start to grow. Never let them get big
- Weed the crop often and kill weeds when they are small and cannot cause damage
- Late weeding will mean lost fertilizer flattened ridges and damage to young plant's root systems
- The rule must be to weed regularly but lightly and disturb the ridge as little as possible

Top Dressing

- Senior management will advise if soils require top dressing
- The crop will grow very fast at this time of the season and any top dressing must be applied within 7 days of planting
- A hole should be made a hand width from the plant on the side of the ridge and the fertilizer placed into it with the right cup
- Never throw the fertilizer onto the ridge it may burn the plant or be washed off by rain



CPA (Crop Protection Agent) Management

- If possible avoid applying chemicals and only apply CPA's that are recommended by Alliance One
- Apply all CPA's exactly as advised and never use extra or apply later than recommended
- CPA's from other crops must never be applied to tobacco
- In future all crops will be tested and leaf with CPA residues will not be purchased by any tobacco company

Hand Insect Control

How?

1.Early

2.Regular

3.Careful

4.Thorough

Why?

1.Safe

2.Residues

3.Easy

4.Cheap

Chemical Insect Control

- Confidor will have been applied which will provide total aphid control until after topping
- Leaf eaters will be the only pest likely to cause damage and can be easily controlled by regular hand picking
- If necessary growers may be advised to spray crops
- When chemicals are applied it must be at a young stage and should not be allowed in large crops

Chemical Control Options

- **1. Acephate** – Mix 1 x number 12 cup per 10 liters and spray over the growing point and young leaves. Apply only once.
- **2. Pyagro** – Mix 2 x number 30 cups per 10 liters and spray over the growing point and young leaves. If required spray again 7 days later
- Apply both chemicals by knapsack sprayer as early as possible when the insects are active and in the open

ACEPHATE is a **POISON** – Handle with Care and Wear Protective Clothing

Re-ridging

- As the crop is starting to grow out and the leaves are expanding the last cultivation and re-ridging should take place
- Soil must be pulled up to create a large ridge that will help the plant survive heavy rains
- All remaining weeds will be covered and soil will be aerated and provide a fresh area for root development
- Care must be taken not to damage or cover any leaves

Diversification and Other Crops

- All **Alliance One** growers should be encouraged to produce other crops which can be grown together with tobacco
- Food crops such as maize, groundnuts and beans will help to provide the grower with food security and additional income
- We must advise our growers how to include other crops in the program and show them **Good Agricultural Practices** for these crops

Reforestation

- All **Alliance One** growing areas will be involved in reforestation schemes
- Firewood and poles are a major part of the crop requirements and we must replace the trees we use
- Growers must be strongly encouraged to plant and maintain woodlots
- Seedlings will be issued to grower as part of some area programs

NTRM Control

- The eradication of all forms of plastic and feathers must be a part of every grower's program
- Keep all tobacco handling areas free of feathers and all forms of plastic
- Old maize bags must never be used for handling tobacco
- Store all maize bags in a secure place. **Treat plastic and feathers like poison – never allow them to be in contact with tobacco**

Early Planting and Efficient Weed Control are

Good Agricultural Practices

ALLIANCE One

Tanzania Early Season Planning

P.G. Baker - Regional Agronomist Africa

Losses from Field to Sales

Topping 18% | Sucker Control 22% | Reaping and Handling 8% | Barn Unloading 4%

Curing 28% | Storage 24% | Grading 18% | Presentation ?? | NTRM Penalties ??

1800 kgs in the Field

1000 kgs Sold | Price Loss ??

Input Requirements

- All planning starts with the intended crop size
- The crop must be matched to the curing capacity
- Two barns are essential for each field and they must be able to hold the whole crop
- **8000 plants** (Half hectare/one acre) will require two barns each holding no less than 200 strings
- Fertilizer requirements must be made based on barn capacity. All other inputs will follow this basic rule

Barn Capacity – 2 x 200 Strings

Input Requirements – Fertilizer and Other Inputs

Seedbed Size – 2 x 20 x 1.5m

Field Area/Plant Count – 8000 Plants

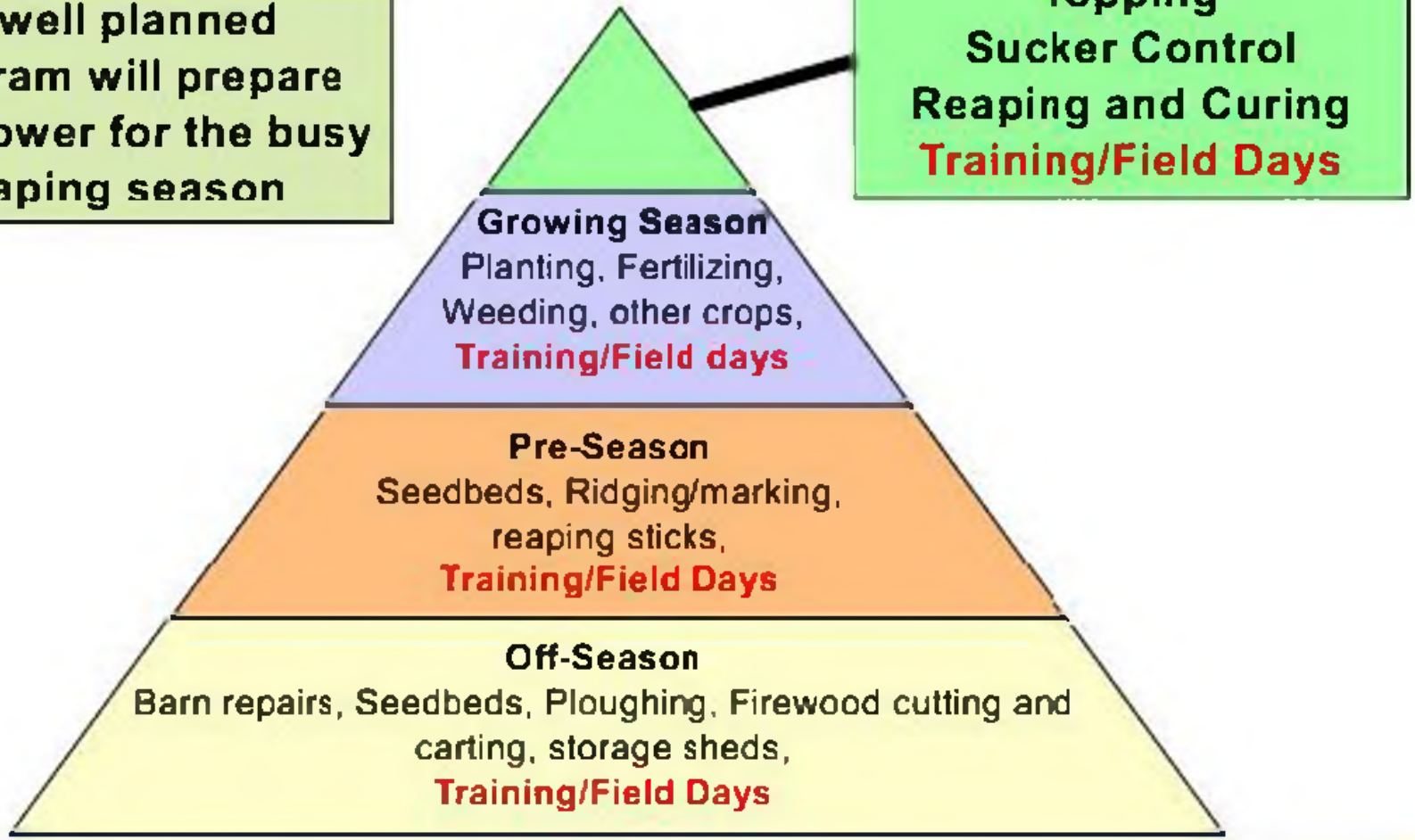
Each Field Requires Two Barns

8000 plants x 2 leaves/week/Reaping @ 80 leaves per string = 200 strings.
One reaping is required every 7 days

Barn turnaround – fill, cure, condition and empty is 8-10 days.
Two barns filled on alternate weeks is required

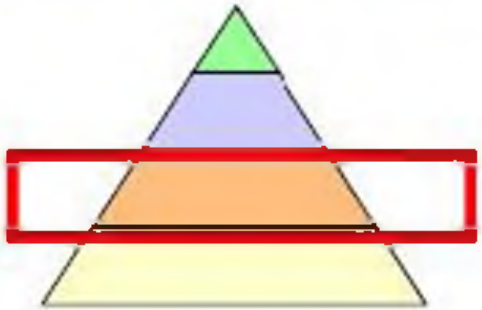
The Value of Planning the Program

A well planned program will prepare the grower for the busy reaping season

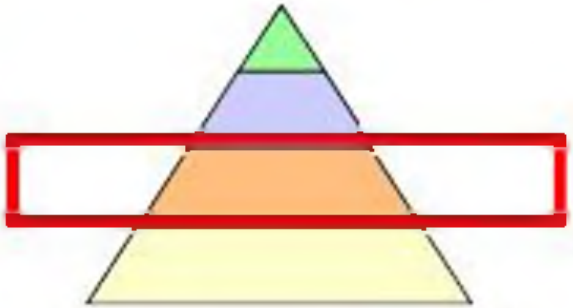


May, June, July, August, September

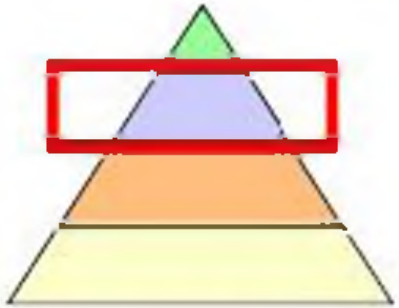
September, October



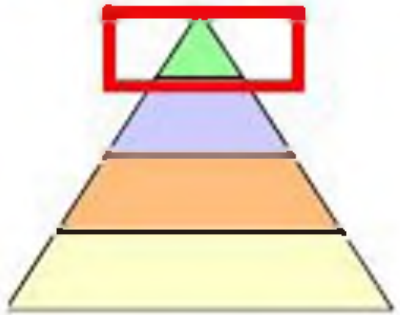
October, November



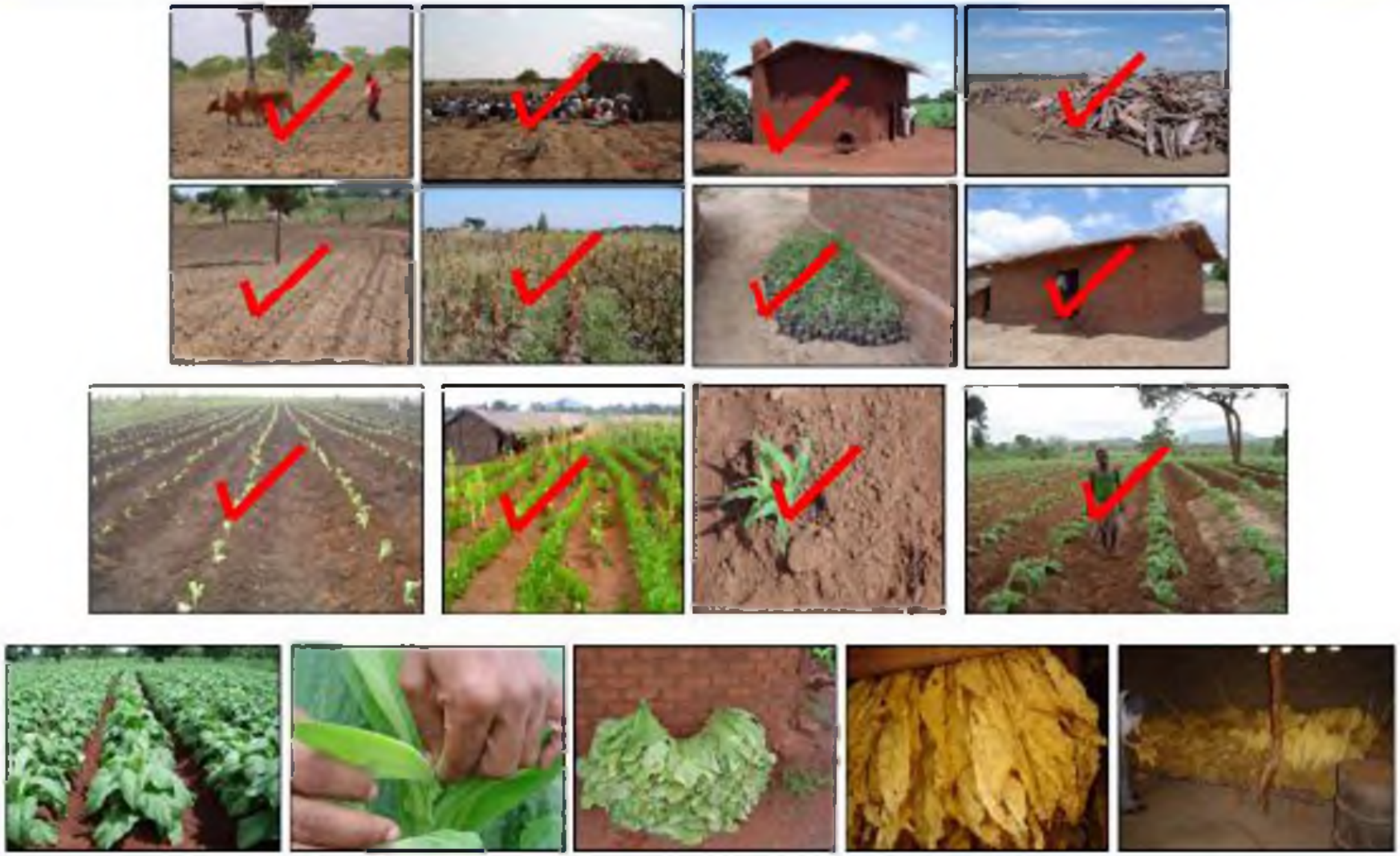
December



January, February, March, April



Follow the Program for Success



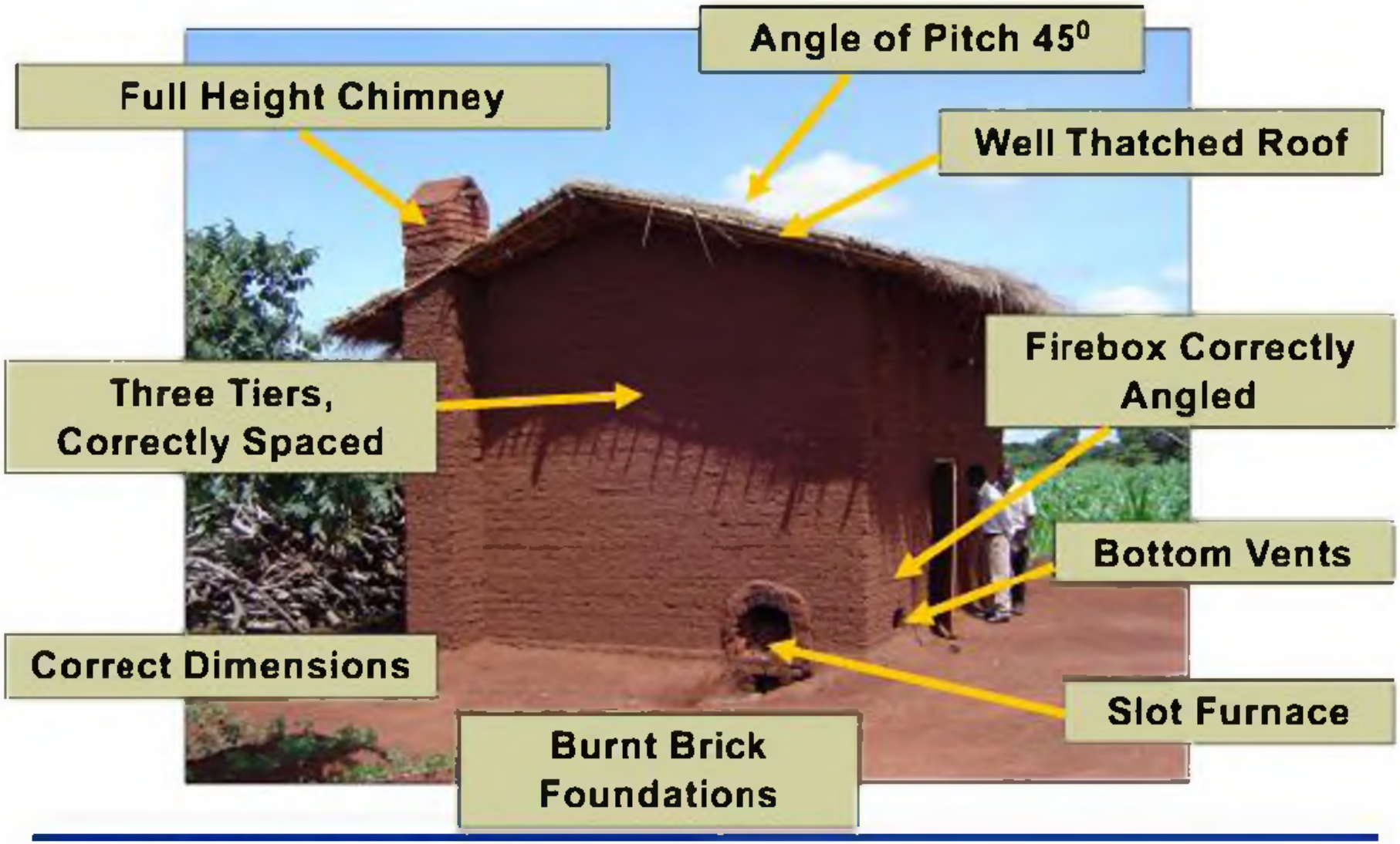
No Program – Big Problems and Failure

June, July, August, September, October, November, December

Land Preparation

- Fields must be prepared in the off-season well before the rains, try to work early to conserve moisture
- The depth should be 25 centimeters with no clods
- **Never** allow growers to delay until the first rains. The first good rains must be used for planting the crop
- Fields established early will produce yield and quality and avoid insects and disease
- Early land preparation is **Good Agricultural Practice**

The Right Barn for Easy Curing



Firewood Requirements

- Where-ever possible use wood from a renewable source or from fields being cleared
- Wood must be split, stacked and checked by the Leaf Technician to ensure there is enough to cure the crop
- 0,5 Hectare/8000 plants will require 18 cubic meters or a stack
  1 m wide x 1,5 m high x 12 m long
- A flue cured crop has no value if it cannot be properly cured – **no wood, no curing – a lost crop**

Seed Requirements

- **Only certified seed should be used**
- Buyers, may, in future, reject leaf that is grown from retained seed because our customers will not accept tobacco from unknown sources
- The requirement is one packet or 3 grams per mother bed
- We must have pure crops and growers must **never** add homegrown seed to the beds
- Correct use of certified seed is a **Good Agricultural Practice**

Seedbed Requirements

- Seedbeds should be 20 meters long and 1.5 meter wide
- For each hectare or 16000 plants, 3 main beds will be required

Seedbed Area = Plant Count = Barn Capacity = SUCCESS

Resetting – the "Mother Bed" Requirement

- A field of one hectare/16000 plants will require two mother beds each 1 x 5 meters
- Each one will require 3 grams
- The mother bed can be made in one of the beds or at the edge of the nursery close to the water.
- Water it thoroughly after fertilisation in preparation for sowing
- Water well after sowing and cover evenly with mulch grass

The "Mother Bed"

- The mother bed of 1 x 5 meters is a small area to water and will save the grower a lot of work.
- This means that for about 30 days the water requirement for the nursery is reduced

Seedling Spacing

- When the seedlings in the mother bed are 50 -70 millimeters high they are ready for resetting
- **Carefully select seedlings of the same size from the mother bed**
- Reset the seedlings at nc closer than three fingers – 6 cms x 6 cms. Using a board with nails at this spacing is the best method of achieving accurate resetting
- Press the board firmly down onto the bed. This will leave small holes which are the positions for the seedlings
- Complete small sections at a time to avoid stress on the seedlings – pull, reset, water and cover with grass as quickly as possible

Resetting

- The transplanted seedlings should be watered and covered with mulch grass
- The grower must select seedlings that are the same size which ensure very uriform beds
- Reset the mother bed section in the same way as the main beds
- The day 14 – 21 watering program should be followed for 5 days to establish the seedlings, after which normal watering can take place

Careful selection of seedlings and accurate spacing will ensure uniform plants

Resetting – Achieving the Best Seedlings

Spacing at 6 x 6 cms

Resetting – the Savings

- For over 30 days only the small mother bed will be watered.
- The grower will be watering two 1 x 5 meter areas instead of three 1.5 x 20 meter full beds. Weed control will be confined to the mother bed. This is a major **labour saving**
- A total of over 8000 liters or 800 x 10 liter watering cans will be saved. With our limited water resources it means growers can produce beds from small water supplies. A major saving in **water conservation**
- Chemical applications will be limited to the mother bed for a 30 day period. A saving in **chemicals**
- **Savings in water, labour and chemicals are Good Agricultural Practices**

Last season our growers in Malawi and Zambia calculated the saving as over 70 kilometers carrying two watering cans

Seedbed Management

- The resetting program has been developed to ensure that the grower's limited water resources are used efficiently
- The watering program is a guide and may need changes, remember to check the seedlings every day – good colour ard even growth will confirm good watering practices

The Standard Watering Program

Days 1 – 14 Apply - 3 Cans Morning/Bed

3 Cans Mid-day/Bed

3 Cans Evening/Bed

Days 14 – 21 Apply – 4 Cans Morning/Bed

4 Cans Evening/Bed

Days 21 – 70 Apply – 16 Cans Morning/Bed

At about 30 days planting out from the mother bed to the main beds will require going back to the day 14-21 program for 5 days

During hardening, when seedlings wilt before mid morning, apply 30 Cans/Bed

Insect Control – Decis Tablet Application

- Decis tablets are a good option because this is a safe chemical and will not leave ary residue on the crop when correctly used
- Mix a half tablet per 10 liter watering can
- Apply four cans of mixture per bed
- Apply this chemical if insect damage is ncticed
- A further application may be required if insects are not controlled at hardening time

Disease Control and Hygiene

- Smoking and snuff taking must not be allowed and growers should wash their hands and tools when entering the site
- Copper Oxychloride should be used. Mix 1 x number 30 cup per 10 liter watering can
- Apply one can to the mother bed at 14 days
- Apply four cans per bed immediately after resetting and repeat every two weeks. Do not mix this with any insecticide

Confidor 70 WG Application

- It should be applied as a drench about 10 days before the expected planting rains
- Mix 10 grams per 40 liters water.
- This is one third of the 30 gram packet that will be issued to growers for their three main beds
- Apply 4 cans per bed. This should be done before watering to ensure the chemical is washed into the root zone

Hardening and Clipping

- Hardening of all seedlings is very important
- Seedlings should be hardened for at least two weeks before transplanting. Clipping may also be required to even out and hold back the plants
- Hardened seedlings will survive in harsh planting out conditions. Soft seedlings will not survive hot weather after transplanting and major losses in stands will take place
- Make sure growers wash hands and tools when clipping

Planting Rains

- Rainfall records and experience will determine the best planting time for good rain and follow up showers
- Good planting rains will fill up the furrows in the field and the box ridges will be wet up to the top. Growers must never rush to plant with early showers
- Digging into the ridge should show wet soil right down to the subsoil. The ideal is a good storm followed by rainy and cool conditions for a few days

Good Quality Seedlings

- Seedlings must have been hardened for at least two weeks
- Advise the grower to **select** seedlings one by one and never to pull out handfuls
- The stem must be of at least pencil thickness
- 15 – 20 centimeters long
- No more than 8 – 10 leaves with a large, healthy root system and no insect or disease damage

Reset seedlings will be easy to select and the majority of them will be good quality

Planting the Crop

- After a good planting rain has fallen the grower must select his seedlings and pull ard plant as quickly as possible
- Growers should pull and plant into the night to get the field finished. **The field must be completed within one day**
- Plant seedlings on the marker straw and press the soil firmly down to force out all air. Depth must be right up to the heart
- Never plant small or weak plants
- Never bend the stem or roots when planting

There is only one chance to plant the crop – get it right first time

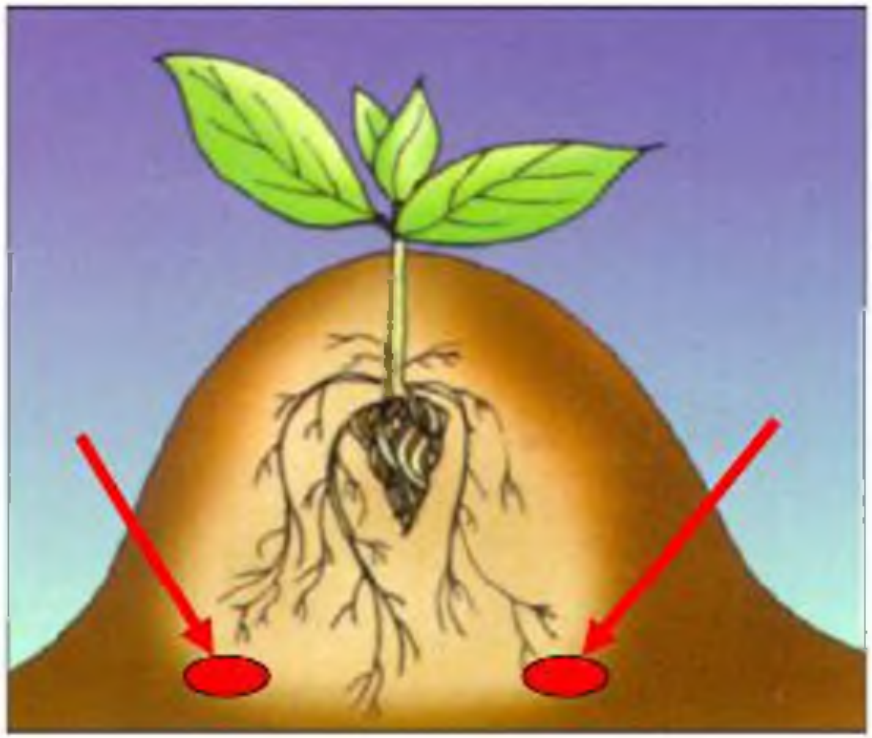
Uniformity and Stands

- The best seedlings should be carefully selected
- Seedlings should be matched to ensure uniformity across the field
- Ridges and plant spacing must be the same as recommended
- Insist on high standards at planting – growers often panic and rush the task. Effective training will ensure that all growers follow standards and achieve good establishment

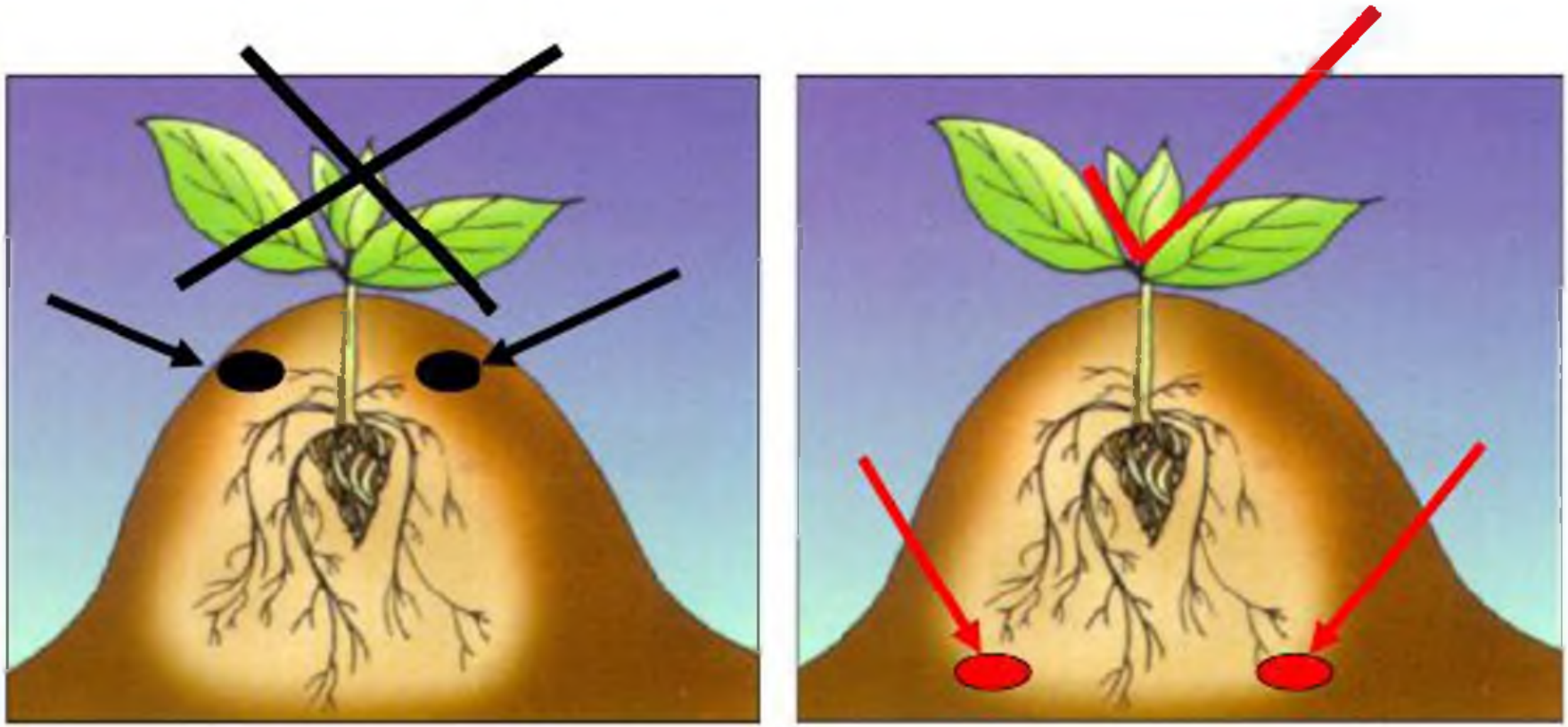
Reset beds will provide the grower with far more good seedlings than required for the field.
This will allow selection of only the best seedlings.
He must not extend the field

N – P – K Fertilization

- Post planting fertilization must be done as soon as possible after planting. Any delay over a week will result in yield loss
- Fertilizer must be applied level with the plant and deep into the side of the ridge. Open the hole with a hoe, apply the fertilizer and close again
- It is critical to apply fertilizer within a few days of planting – any delay will seriously affect yield and quality
- Dig down level with the plant into the side of the ridge
- Apply the fertilizer into the hole and cover well with soil



Correct Fertilizer Placement

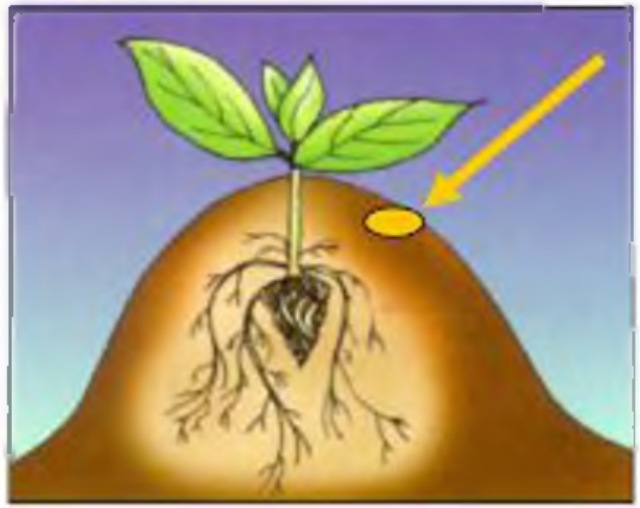


Weeding

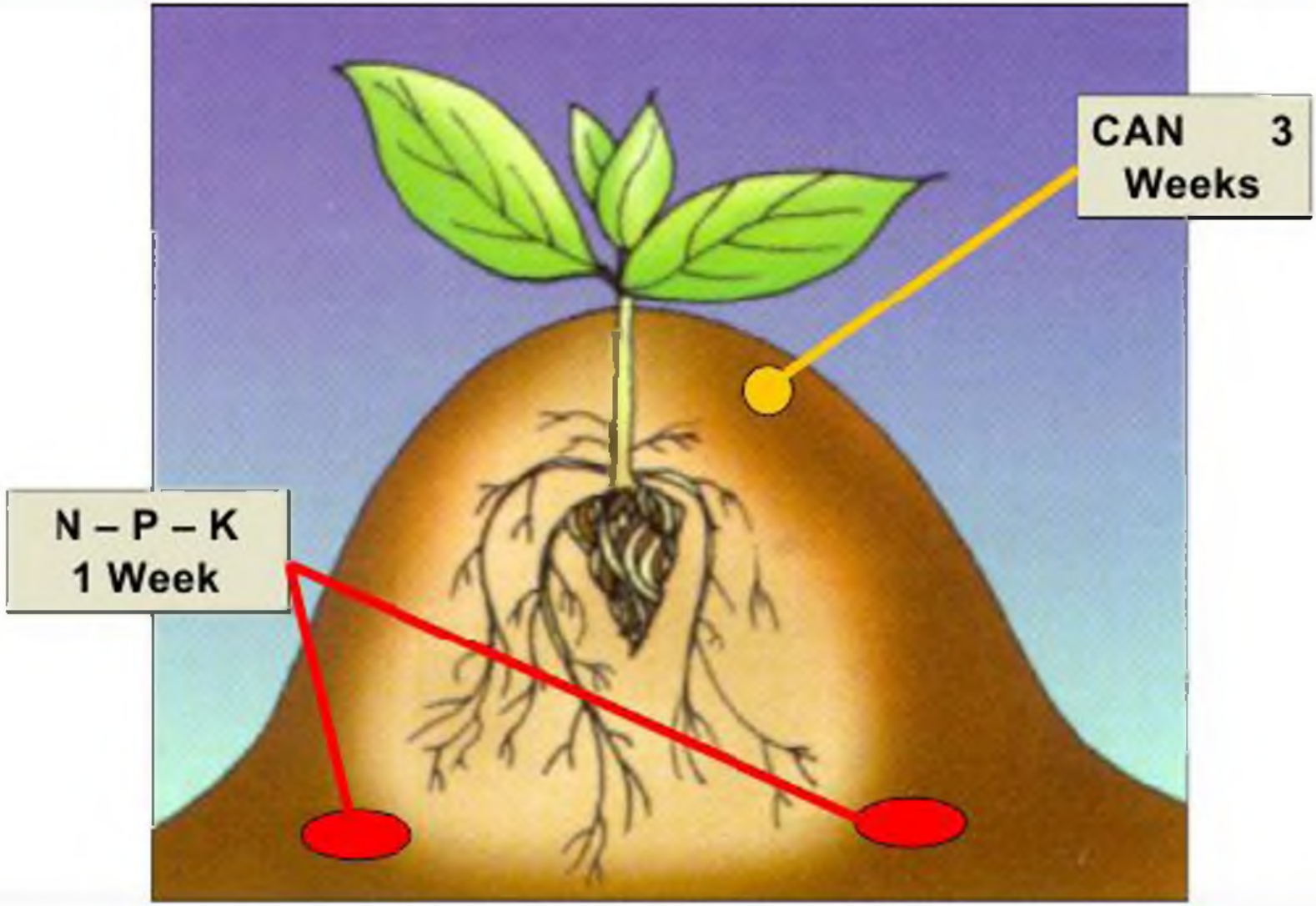
- Within a few days of planting weeds will start to grow. Never let them get big
- Weed the crop often and kill weeds when they are small and cannot cause damage
- Late weeding will mean lost fertilizer flattened ridges and damage to young plant's root systems
- The rule must be to weed regularly but lightly and disturb the ridge as little as possible
- Weed free crop are **Good Agricultural Practice**

Top Dressing

- The crop will grow very fast at this time of the season and any top dressing must be applied three weeks after planting
- A hole should be made a hand width from the plant on the side of the ridge and the fertilizer placed into it with the right cup
- Never throw the fertilizer onto the ridge it may burn the plant or be washed off by rain
- Make sure the crop is totally weed free before applying the top dressing



Fertilizer Placement and Timing



Crop Chemical Management

- If possible avoid applying chemicals and only apply chemicals that are recommended by ATTT
- Apply all chemicals exactly as advised and never use extra or apply later than recommended
- Chemicals from other crops must never be applied to tobacco
- All crops will be tested and leaf with chemical residues will not be purchased by any tobacco company

Hand Insect Control

How?

1. Early
2. Regular
3. Careful
4. Thorough

Why?

1. Safe
2. No Residues
3. Easy
4. Cheap

Chemical Insect Control

- Confidor will have been applied which will provide total aphid control until after topping.
- Leaf eaters may cause damage and should be easily controlled by regular hand picking
- If necessary growers may be advised to treat crops with Decis Tablets
- Mix a half tablet per 10 l tre watering can
- Apply with a knapsack sprayer or splash over the growing point with a number 16 mls cup or the "paintbrush" method
- Make sure the small leaves on the growing point are well covered

Re-ridging

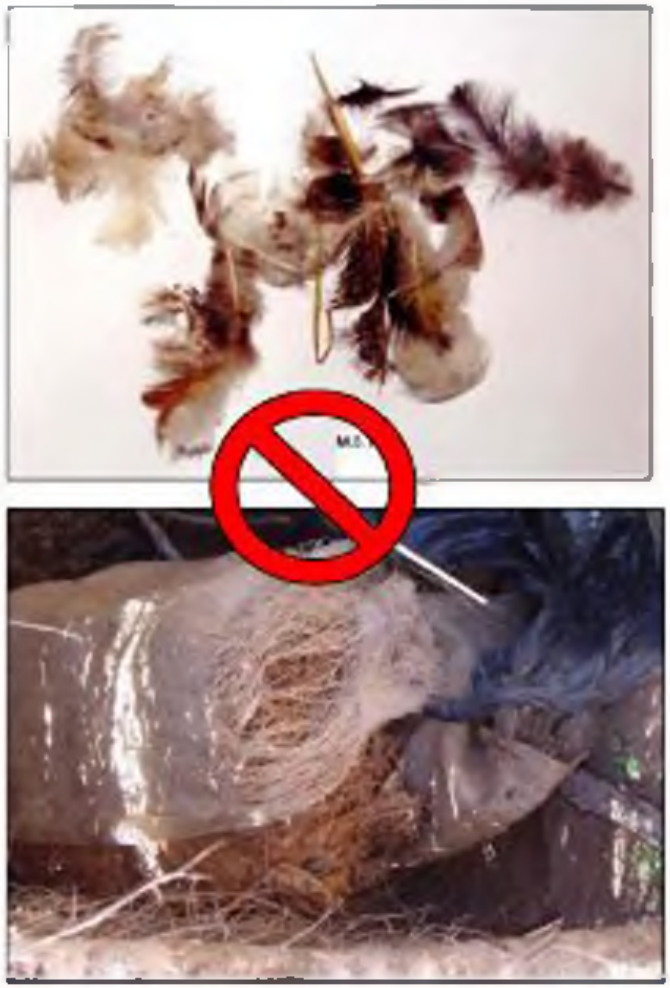
- As the crop is starting to grow out and the leaves are expanding the last cultivation and re-ridging should take place
- Soil must be pulled up to create a large ridge that will help the plant survive heavy rains
- All remaining weeds will be covered and soil will be aerated and provide a fresh area for root development
- Care must be taken not to damage or cover any leaves

Other Crops

- All growers should be encouraged to produce other crops which can be grown together with tobacco
- Food crops such as maize, groundnuts and beans will help to provide the grower with food security and additional income
- We must advise our growers how to include other crops in the program and show them **Good Agricultural Practices** for these crops

A Reminder - NTRM Control

- NTRM awareness must be a part of every single operation we carry out
- Contamination of our tobacco by feathers and plastic must be stopped
- Strict buying controls will be enforced to prevent the purchase of any contaminated tobacco
- **Stop the problem where it begins – with the grower**



Alliance One is not just a buyer of tobacco.

Our aim is to assist in the introduction of improved farming methods **(Good Agricultural Practices)** to **Growers** and help them make better returns that improve their living conditions and create wealth within their communities

ALLIANCE One

6. Flue Cured Tobacco Topping

P.G. Baker – Regional Agronomist Africa

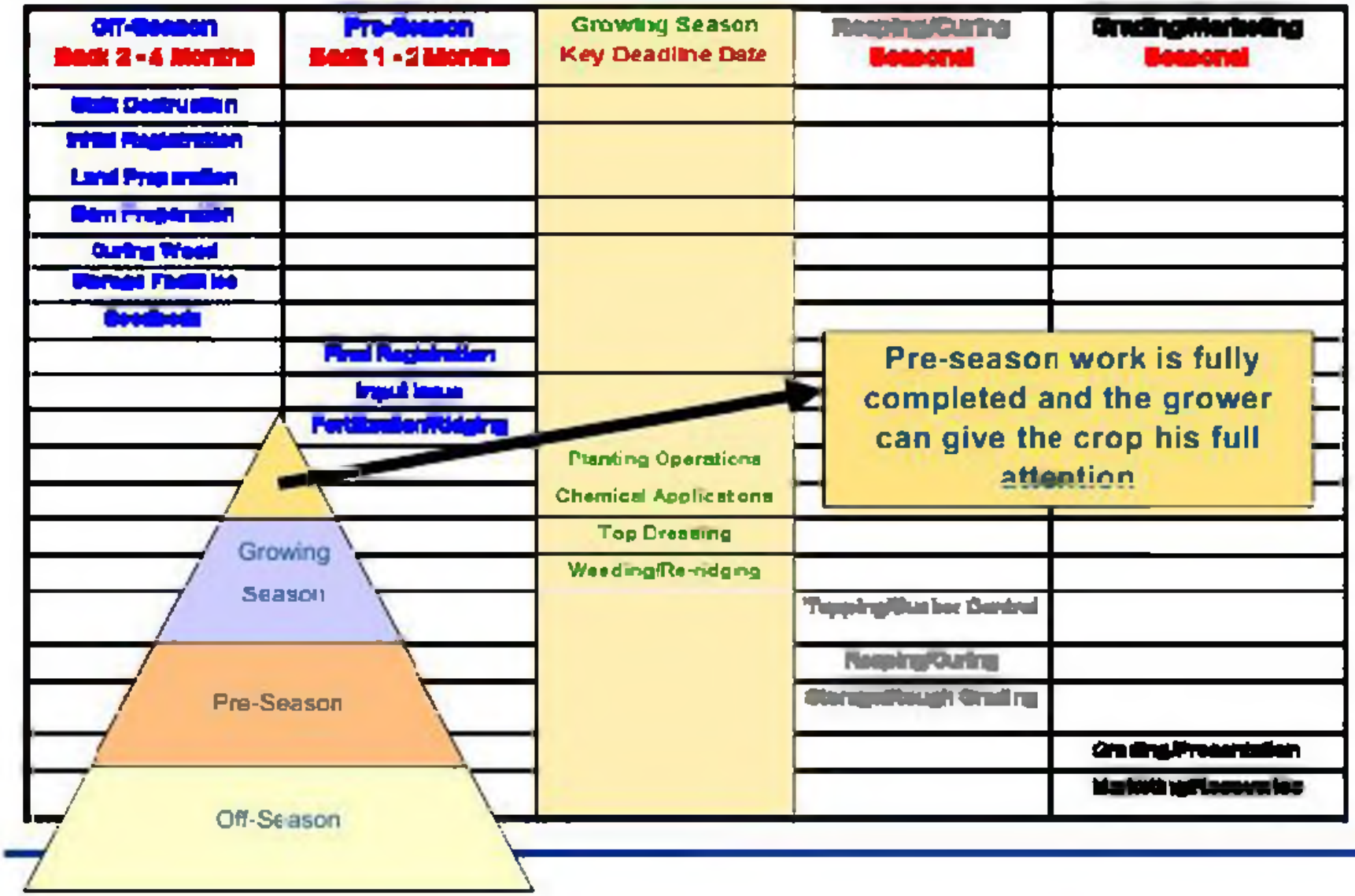
Pre Season Operations

- All pre-season operations must be completed before planting
- All growers must have the right barn to plant ratio. Firewood must be stacked and ready
- The planning and completion of all operations on time means that the grower should never have a clash of tasks
- By following the programs the farmer will successfully manage tobacco and other food crops at the same time

Preparation For the Season and the Future

- The storage shed for the cured leaf must be ready for use
- It must have a burnt brick floor above ground level with a sound roof that will not leak. Racks for the leaf must be constructed
- The storage shed is compulsory for all growers to prevent losses in quality and mould
- **Plan for the future**. Each grower must have his trees planted with the first rains to ensure he will have firewood and poles for many years ahead. **All Alliance One farmers should be part of this program**

The Reasons for the Planning Program



The Timing of Field Days

- The timing of the field days is very important.
- The grower should take no longer than three days to complete the topping operation
- Field days should be held at the earliest crops in the area. This will allow growers time to return to their own fields and carry out the operation
- **It is essential that all growers attend these field days. All crops must be topped correctly – there is only one opportunity to get it right**

When to Start Topping

- Do not look at plant height, count the developing leaves to ascertain topping time and leaf number
- If 15 % of the plants are ready the operation can start. Over 60 % of the field ready at topping stage can be achieved with uniform crops
- Well grown crops should be topped to standard leaf counts. Weak crops may require reduced leaf numbers

Complete Farmer Understanding of Topping

- Timing is critical.
- Growers should have complete understanding of all tasks which must be carried out correctly on every field
- Involve growers in all aspects of the demonstrations and repeat each point several times to allow full understanding
- Keep all points simple and clear. The standards are very basic with clear and easy instructions on how to achieve them

Lower Leaf Priming

- Primings will usually be reaped soon after topping, once they are ripe
- **Some** countries have developed a new practice as a result of poor demand from customers for primings
- Immediately before topping, four leaves are removed and discarded
- After this, the remaining leaf number, usually 18, is counted and this is the topping height.

The Reason for Priming

- Priming removes thin, trashy lower leaf and means more bodied styles are produced
- It is also a method of making sure that all plants are topped to exactly the same leaf count
- Priming makes the reaping operation very simple and ensures that all leaf is from the same position on the plant
- Uniform crops are the foundation of a successful reaping and curing program

The Most Important Operation of The Season

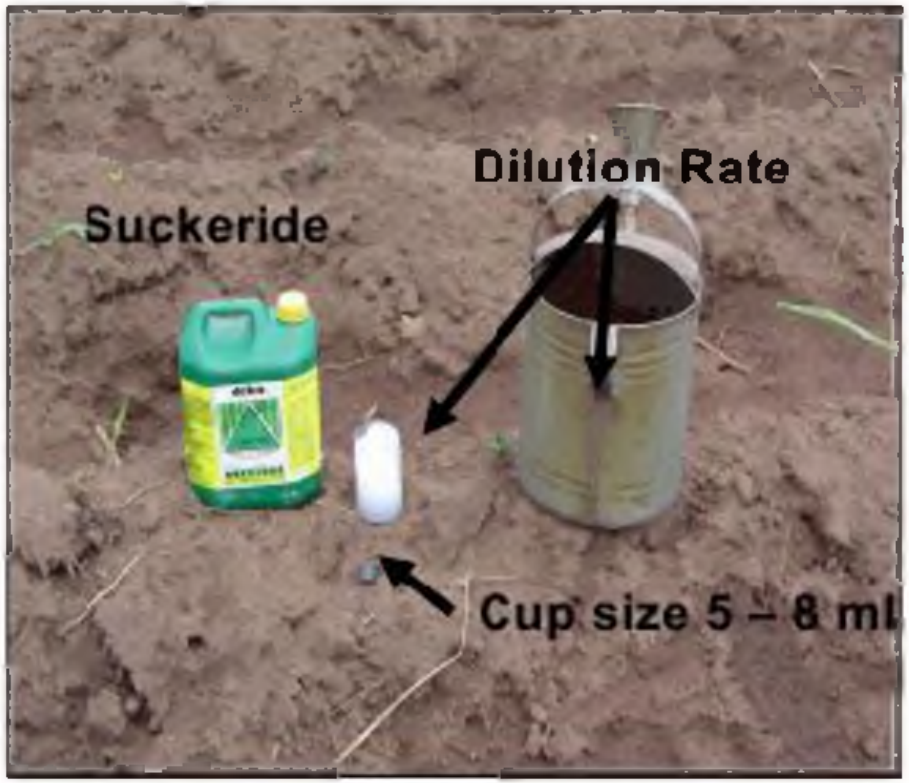
- Topping is the single most important operation of the season and determines quality and yield
- Remove the bud as soon as it can be reached without damaging the other leaves
- Count the leaves regularly to ensure even topping height
- By counting the leaves, the topping will take place at exactly the right time and leaf number. All plants should be identical

Crop Response and Growth

- The early topping will cause a dramatic change in the plant
- Over 25 % new root growth will occur almost immediately. This means all applied fertilizer will be taken up
- The plant will green up and massive leaf expansion will take place
- Early and low topping also improves the plant's ability to resist pests and diseases through the healthy root system and clean leaves

Chemical Sucker Control

- With early topping, vigorous sucker growth starts and chemical control measures are essential
- Senior management will select the best suckeride for you
- Ensure the growers apply the chemical at topping time and that correct measurement and mixing takes place
- Suckerides must be used as soon as possible after mixing and should be kept agitated
- The correct cup size for application must be used



Cup Size and Chemical Requirements

- Senior management will assist in determining the correct amount of suckeride to use
- The run-off at the base of the plant will clearly show the right quantity to use
- In most cases a 5 ml cup will be adequate but well grown out, tall crops may need up to 8 mls
- Apply exact requirements. We must always avoid chemical residues on leaves and soil

Application Of Suckeride

- Because of the low height of the early topped plants, very small amounts of suckeride are applied
- Application should be split on to different leaves at the top of the plant to ensure all axils are reached with the suckeride
- The top leaves should be held slightly apart so the chemical can be accurately applied
- Over application must also be avoided

Our Target – A Crop with Quality and Weight

- Growers who have faithfully followed our programs should produce crops with both good weight and quality

- Our planning has prepared for this busy time. The grower will be able to cope with reaping, curing and sucker control at the same time – **because he does not have any other work to do**

- Correct timing and advice will help the grower to get the best out his crop. He will now clearly see the benefit of the **Alliance One** program and the standards we promote

NTRM Control

Early Topping and Effective Sucker Control are

Good Agricultural Practices

ALLIANCE One

7. Flue Cured Tobacco Reaping and Curing

P.G. Baker - Regional Agronomist Africa

Pre-season Operations

- We must prepare our growers for the busy period – **follow the programs exactly**
- Barns, storage sheds, reaping sticks, strings, bundles for carrying the leaves, NTRM programs. Are the growers ready?
- Barn specifications must be correct. Any curing problems will delay the crop
- Has the grower's training been effective?

The Reason for the Planning Program

Topping and Priming

- Priming of the bottom, trashy, leaves may take place according to customer demand
- Normally grown out, healthy plants should have been topped to 18 leaves in both primed and unprimed crops
- Suckeride should have been applied and will result in effective control of new sucker growth
- Uniform crops will be completely topped and ready for reaping

Sucker Control

- The application of a suckeride will assist in sucker control
- Effective and regular hand suckering will be essential for the whole reaping season
- Uncontrolled suckers will destroy quality and yield potential within a few days and can never be recovered
- Suckers must be removed before they are 25 mm long or the length of your thumb

What Crop Uniformity Means

- Every task we have carried out on the crop has been aimed at achieving a uniform crop
- This is critical with flue cured crops because of how the crop will be reaped
- An uneven field will be a problem for the whole season. A uniform crop will make every single operation simple and give a very good result
- **We must get it all right from the start of the season**

Leaf Counts and Barn to Plant Count Ratios

- The whole program has been linked to make every task simple and clear

- Seedbeds, plant counts, barn ratios and in fact everything that has been done to the crop has been carefully worked out. Even an inexperienced grower can follow the systems

- **Crop Inputs = Seedbed area = Plant Count = Barn Capacity = Success. This is the secret of the Alliance One program!**

Quality and Single Leaf Reaping

- We must think forward when we start reaping – will the buyer be happy with the crop? He will require quality and uniformity, not badly handled mixed styles

- Single leaf reaping ensures that every leaf is taken off at exactly the right stage of ripeness and is identical to it's neighbour

- **Quality, uniformity and no wasted or spoiled leaf are the targets – single leaf reaping will achieve this**

When to Start Reaping

- About 3 - 4 days after topping the crop should be ready for reaping
- A sample should be taken after topping and kept in a dark place in a kitchen. If this sample fully colours in 48 - 56 hours the crop is ripe and reaping should start
- Once reaping has started, colouring time in the barn will be the best indicator of ripeness
- Use the 48 – 56 hour colouring time as a guideline for the entire reaping operation – the barn shows you when to reap

48 Hours

How to Reap

- **Always** remove the lowest leaf
- **Always** break the midrib right at the stalk
- **Only** remove one leaf per reaping, if possible and **Never** more than two at one time
- **Never** take upper leaves and leave the lowest behind
- **Never** leave broken midribs behind on the stalk

Leaf Counts per String or Stick

- Each string must have exactly the right number of leaves
- Over packing strings will cause difficult curing and big losses in weight and quality
- Reap 20 leaves and leave the bundle in the row
- When the bundles are collected put four together and carry them back to the barn
- **4 bundles x 20 leaves = One string – the exact requirement**

Leaf Counts into The Barn

- Single leaf reaping and counting the bundles makes sure each string is exactly 80 leaves. No time is wasted counting at the barn and each string is simply filled from one bundle

- The barn sizes will match the leaf and string counts from the field. 7000 plants = 90 strings and 14000 plants = 180 strings.

- As the crop ripens, the grower may have to reap two's, still following all of these principles but **never** exceeding this

Correct Barn Packing

- Remember our programs are all linked – plant count at 80 leaves per string = barn size = easy curing = quality and weight
- Strings or sticks must be placed no closer than 30 cms apart on the tiers
- All tier boxes must be evenly filled – never over pack and never under pack
- Follow the simple programs to achieve easy cures of good quality leaf

Cold Colouring – The Worst Enemy

- Each reaping operation must be completed on the same day. This task should take only 5 -6 hours and will be easily achieved by the grower with his family or labourers

- Leaves that are cold coloured may turn yellow – but this is not correct. They will turn rotten and brown and be a total loss because no moisture has been removed

- **Always tie and pack all reaped leaf on the same day**

Over packing – Another Bad Enemy

- Never allow more than two leaves per reaping - **maximum**
- Over reaping will mean too many strings for the barn. Leaf will be damaged and bruised
- Over packed barns will be mixed and uneven and take longer to cure. Barn rot will develop and large quantities of good leaf will be lost
- Leaf will be lost in the field because of extended cures and lost barn turnaround time

Uneven Reaping – Uneven Curing

Poor Reaping – Difficult Curing – Bad Results

The Reasons for Exact Barn Specifications

- Correctly laid out fireboxes will ensure even heating and control of temperatures
- The rise of the firebox must be at least one brick or a half builder's level at each bend
- Tiers must be 70 cms apart.
- The first tier must be 2 metres from the floor

Barn Efficiency

- A good slot furnace with the other improvements will promote an efficient fire and reduce firewood consumption by up to 40 %
- Control of temperatures will be easy and fluctuations or flashes when stoking will not be a problem
- The full length chimney will make certain there is a good draw on the fire. This will heat the whole barn evenly and provide uniform and quick cures

The Right Barn – The Perfect Cure

- The furnace
- The chimney
- The firebox layout
- Bottom vents
- The tiers
- A sound roof
- **The right barn – easy cures, good turnaround times and quality leaf**

What is Curing?

- Curing is the breakdown of carbohydrates, mainly starches, to sugars through a process of drying – not just heating
- The leaf must be kept alive during this process as the leaf turns from green to yellow – this must never go too far as the leaf will turn brown and trashy – a total loss
- This stage is critical and the leaf must be "killed" through the combination of heat and ventilation to fix the desired colour
- Complete drying out of the lamina must then be achieved and is often the most difficult part of the cure to manage
- The final process will be the drying of the midrib and a complete cure will be achieved within six days

Assessment of Ripeness

Colouring

- During colouring the leaf stays alive as it turns from green to yellow. If this continues for too long the leaf will turn brown – never over-colour
- We must allow this process to take place by removing as much moisture as possible without drying the lamina out too quickly
- We are removing moisture or wilting the leaf while it changes from green to yellow by keeping the temperature low and venting the barn

Temperature Control at Colouring

- A small fire is all that is required
- The temperature should be checked by hand half way along the flue layout. If the hand can be placed on the flue without being painful it is right. If the hand cannot be placed on the flue it is too hot
- Maintain this temperature with bottom vents open as the leaf turns yellow and wilts. This should take about two full days with a crop reaped at the correct stage of ripeness

Fixing Colour

- Once the leaf has coloured and wilted we must dry the lamina out and "kill" the leaf as quickly as possible
- Up to 25 % of the water in the leaf will already have been removed during colouring
- By raising temperatures at this stage 50 % more moisture will be removed within the next two days
- It is very important to dry the lamina as quickly as possible

Drying The Lamina and Midrib

- Once the lamina has dried and moisture has been lost the temperature will start to rise, even with a small fire
- This indicates that fixing colour can start and a larger fire is now required
- Once the leaf rattles when touched make the fre even bigger and raise the temperature as high as possible to dry the midrib
- Midrib drying will take two days

Curing Summary

- Day 1 – 2. Colouring and wilting. Maintain a small fire and vent the barn. 25 % of the leaf's water will have been removed
- Day 3 – 4. A full wilt and colour will have been achieved and the lamina will be dried out. The temperature will be climbing and over 50 % more water will be removed from the leaf
- Day 5 – 6. Midrib drying will take place. A large fire and small amount of ventilation is necessary
- Day 7 – 8. Cool down and unload the barn. On day 8 if the crop is ripe, reap and repack the barn. This cycle is known as barn turnaround – fill, cure, condition, unpack and refill = 8 days

COLOUR ON FLUE TEMPERATURE, OBTAIN A FULL WILT BY VENTING EARLY AND DRY FAST

Conditioning Cured Leaf

- Once all of the leaf is dry the leaf must be conditioned to avoid breakage when unloading
- Open the door to allow the barn to cool down and take up condition
- Unpacking will normally be taking place when it is raining. Make sure leaf never gets wet and do not allow leaf to become over-conditioned or too soft
- **Never over-condition leaf as it goes into storage**

Common Curing Problems

- Reaping programs. Ripeness. Cold colouring
- Leaf and string counts. Over packing. Barn packing
- Barn design. Furnaces. Flue layouts. Chimneys
- Stoking methods
- Curing management. Over colouring
- Ventilation. Air flow. Roofing

AVOID ALL OF THESE PROBLEMS – FOLLOW THE SIMPLE AND RELIABLE PROGRAM

Rough Grading

- Uniform crops, single leaf reaping easy curing = easy grading
- Uniform cures will be the reward for the grower who has closely followed the systems. Very few grades will come out of each string
- When barns are unpacked the leaf can be separated into grades and placed into the storage racks
- When final grading takes place there will be very little work to prepare for selling – exactly what our programs intended

The Storage Shed

- The storage shed is an essential part of the program
- Every season large amounts of top quality leaf is wasted because of poor storage
- A raised floor, good roof and leaf racks are required to keep the leaf in the best condition
- Double level racks allow space for turning leaf to prevent mould
- Never stack leaf too high to avoid staining and loss of quality

Inspection and Care of Stored Leaf

- All growers must attempt to provide a storage shed
- Over 24 % of our flue cured crops are lost through mould and staining. This is the result of leaf that is too moist to store safely
- Regular checks must be made of all stored leaf. It should be turned especially in the early season to prevent mould and staining
- Never pack the leaf into big high stacks. Maintain stacks of 1m x 1m x 1m which will be about 40 – 60 kilograms.
- Rough bales or slat packs are a good option, but they must also be opened and checked regularly

NTRM Eradication

- Maintain all NTRM awareness programs with the growers
- All leaf handling areas must be kept free of all forms of plastic and feathers
- Check barns
- Storage sheds are very important – no plastic, no feathers
- **KEEP ALL FORMS OF PLASTIC AND FEATHERS AWAY FROM TOBACCO**

Reaping Mature Ripe Tobacco and Efficient Curing Methods are

Good Agricultural Practices

ALLIANCE One

Flue Cured Tobacco Reaping and Curing

Alliance One is not just here to buy tobacco.

We are here to bring improved farming methods (GAP) to our Growers and help them make profits to improve their living conditions and create wealth within their communities

Losses from Field to Sales

Topping 18% | Sucker Control 22% | Reaping and Handling 8% | Barn Unloading 4%

Curing 28% | Storage 24% | Grading 18% | Presentation ?? | NTRM Penalties ??

1800 kgs in the Field

1000 kgs Sold | **Price Loss ??**

The Value of Planning the Program

A well planned program will prepare the grower for the busy reaping season

Topping

Sucker Control

Reaping and Curing

Training/Field Days

Leaf Counts and Barn Requirements

- Seedbeds, plant counts, barn ratios and all tasks with the crop have been carefully worked out
- The correct number of barns to the planted area is a major area of concern
- Inadequate barn space is responsible for more loss of tobacco than any other factor

Seedbed Area

Plant Count

Field Size

Barn Capacity

What Crop Uniformity Means

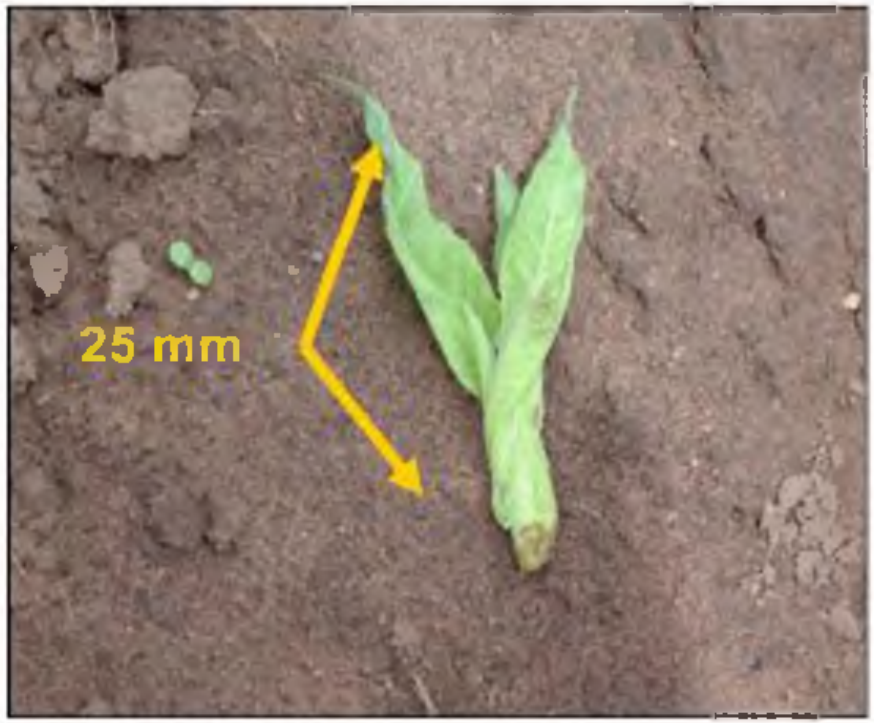
- A uniform crop will make every single operation simple and give a very good result
- This is very important with flue cured crops because of how the crop ripens and will be reaped
- **An uneven field will be a problem for the whole season**

Topping

- Normal topping height should be to 18 reapable leaves
- Top as early as possible and if the crop is not looking vigorous then topping height may be reduced to ensure good growth in all remaining leaves
- **Suckeride must be applied by cup** – it is the best method because -
  1) It is accurate and reaches all suckers
  2) Less chemical is used, saving the grower's costs
  3) It does not leave chemical residues on the leaves

Sucker Control

- Effective and regular hand suckering will be essential for the whole reaping season
- Suckeride will make sure the grower is able to cope at the busiest time of the season
- Suckers must be removed before they are 25 mm long or the length of your thumb
- **Uncontrolled suckers will destroy quality and yield within a few days.**



A loss through bad sucker control will NEVER be recovered

When to Start Reaping

- About 2 - 3 days after topping, the crop should be ready for reaping
- Leaf samples should be taken after topping and kept in a dark place.
- If the sample fully colours in 48 hours the crop is ripe and reaping should start
- Use the 48 hour colouring time as a guideline for all reaping
- **Colouring time in the barn shows you when to reap**

How to Reap

- **Always** remove the lowest two leaves
- **Never** more than two at one time, per reaping
- **Always** break the midrib right at the stalk
- **Never** take upper leaves and leave the lowest behind

Leaf Counts per String

- String counts must be a minimum of 80 leaves and maximum of 100 leaves
- Over packing strings will cause difficult curing and big losses in weight and quality
- Reap 20 leaves down a row and leave the bundle in the furrow
- When the bundles are collected put four together and carry them back to the barn
- This will mean tying at the barn will be very quick because no counting will be required
- **4 x 20 = 80 or 5 x 20 = 100**

Barn and Field Requirements

ONE ACRE REQUIRES TWO BARNS – ONE BARN IS NOT ENOUGH

One Acre – One Barn – Big Losses

A Good Crop is Worth NOTHING Without Enough Barns

Over packing – A Big Problem

- **Never allow more than two leaves per reaping**

- Over reaping will mean too much leaf for the barn.
- Leaf will be damaged and bruised
- Over packed barns will be mixed and ureven and take longer to cure.
- Barn rot will develop and large quantities of good leaf will be lost
- Leaf will be lost in the field because of extended cures and lost barn turnaround time

Cold Colouring – The Worst Problem

- Each reaping operation must be completed on the same day.
- This task should take only 5 -6 hours and will be easily achieved by the grower with his family or labourers
- Leaves that are cold coloured may turn yellow – but this is not correct colouring. They will turn rotten and brown and be a total loss because no moisture has been removed
- **Always tie and pack all reaped leaf on the same day**

Uneven Reaping – Uneven Curing

Bad Reaping = Difficult Curing = Bad Results

Barn Efficiency

- A good slot furnace will promote an efficient fire and reduce firewood consumption by up to 40 %
- Control of temperatures will be easy and fluctuations or flashes when stoking will not be a problem
- It is very important to cover the furnace door to ensure the heat is directed into the barn and compete burning of wood is achieved

Reforestation and Curing Efficiency

- Alliance One actively promotes reforestation programs in all of our growing areas
- We promote sustainable wood resources and discourage the use of indigenous wood without adequate replacement
- We are actively involved in research and development of alternative curing techniques and systems
- The development of efficient furnaces and curing set-ups is a priority
- The "Rocket Barn" concept, presently under trial and development in Malawi, Tanzania and Kenya is an exciting prospect with the prospect of massive wood fuel reductions

The Right Barn – The Perfect Cure

- The furnace
- The chimney
- The firebox layout
- The tiers
- A sound roof
- **Bottom vents** – without good ventilation the cure will fail

The right barn will provide easy cures, firewood efficiency, good turnaround times and good quality leaf

What is Curing?

- Curing is a chemical process that takes place in the leaf to produce sugars through a process of drying
- The leaf must be kept alive during this process as the leaf turns from green to yellow – this must never go too far as the leaf will turn brown and trashy
- **The full wilt stage is critical and the leaf must be "killed" through the combination of heat and ventilation to fix the desired colour**
- **Complete drying out of the lamina must then be achieved and is often the most difficult part of the cure to manage**
- Midrib drying, the final stage will be completed within two days

The combination of heat and good ventilation to obtain **colour** and a **FULL WILT** is the secret to curing

Venting and Getting a Full Wilt

The bad cure – no vents, overpacking, cold colouring, poor stoking

Water

The good cure – full ventilation, correct packing, good stoking

Primings and Lugs

200 kgs of dry Primings and Lugs will lose 1000 kgs of water during the cure

Cutters

8 Drums of Water

200 kgs of dry Cutters will lose
1600 kgs of water during the cure

Leaf

200 kgs of dry Leaf will lose
800 kgs of water during the cure

Tips

200 kgs of dry Tips will lose 600 kgs of water during the cure

The Barn's Water Loss During Curing

Start of Cure
100% Water
(1200 litres)

Colouring
30% Water loss
(400 litres)

Fixing colour and
lamina drying
50% Water loss
(600 litres)

Midrib drying
20% Water loss
(200 litres)

Bad Curing – Big Losses

Conditioning Cured Leaf

- Once all of the leaf is dry the leaf must be conditioned to avoid breakage when unloading
- Open the door to allow the barn to cool down and take up condition
- Unpacking will often take place when it is raining. Make sure leaf never gets wet and do not allow leaf to become over-conditioned or too soft
- **Never over-condition leaf as it goes into storage. Once leaf is in storage check regularly to avoid mould and leaf spoiling**
- **The ideal is to have a special storage shed to keep leaf in the best condition**

Leaf Positions and Storage

Reaping from the same position will make curing easy

Good reaping and **curing** will produce leaf that is easy to rough grade

Store leaf from the same position together

Grade and tie leaf from the same position together

Bale leaf from the same positions together

Mixed leaf positions will mean low prices

Always keep leaf from the same position together

NTRM Control

- Maintain active NTRM awareness programs with the growers
- All leaf handling areas must be kept free of all forms of plastic and feathers
- Barns
- Storage sheds are very important – no plastic, no feathers
- During grading and tying
- During baling

KEEP ALL FORMS OF PLASTIC AND FEATHERS AWAY FROM TOBACCO

As Growers and Leaders in the Community we ask you to take this message back to your Growers THIS SEASON

ALLIANCE One

8. Flue Cured Tobacco – Grading and Presentation

NTRM

Grading and baling areas must be kept totally clear of all forms of plastic and feathers. Careful inspection of all leaf must be made to ensure the crop is free from plastic and feathers

Crop Uniformity – Where it all Started

- Al **Good Agricultural Practices**, from seedbeds through to crop management assist our grower's in producing uniform crops
- Uniform crops, where every plant is the same are easy to top and straight forward to reap
- Uniform crops can be reaped at exactly the right stage and cure easily with very little trashy leaf
- Uniform fields = Even Reaping = Easy curing = Easy Grading = Success

Reaping – "Step One"

- As long as the crop has been well reaped grading will be easy
- Reaping lightly usually one's and never more than two's will ensure that curing is even which will cut down the number of grades in every string
- Light, controlled reaping will also keep leaf positions together
- By controlling reaping, plant positions, leaf colour, length and style will all be the same – the first step in grading the crop

Curing – "Step Two"

- Uniform and controlled reaping means easy and uniform curing
- Leaf will go through colouring and drying phases in the same amount of time which means it is going to be very similar in style and appearance
- Well reaped and evenly cured strings from the same plant positions will only require a quick and simple grading process
- Good curing assures top quality and good yields, with no trash

Rough Grading – "Step Three"

- Careful handling of the crop **at this stage** can prepare for final grading
- As tobacco is unpacked, quickly grade each string and remove any leaves that do not match. Keep these rough grades and plant positions together
- A good storage shed will make this an easy task for the grower
- This will make final grading and preparation for sale very easy and quick

Storage and NTRM Control "Step Four"

- Rough baled or bulked leaf must be kept in its plant positions
- Condition of stored leaf is very important. Check regularly and turn leaf during storage
- Badly stored leaf can result in breakage, mould and staining. This will make grading far more difficult and result in large losses
- NTRM control – no feathers or plastic must be allowed near the stored crop

Plant Position Descriptions

1. Primings and Lugs. Bottom leaves 1 – 4. Pale in colour. Thin, light and weathered

2. Cutters. Leaves 5 – 9 in mid stalk. Orange in colour. Broad, thin to medium bodied with stretch

3. Leaf. Leaves 10 – 15 in upper stalk. Orange to mahogany in colour. Long and narrow, medium to heavy bodied, with good stretch. Thin and bodied leaf must be separated

4. Tips. Leaves 15 – 18 at the top of the stalk. Mahogany in colour. Short, narrow, medium to heavy bodied, with stretch

Primings and Lugs

Leaves 1 – 4 or 5

Primed Crops – Primings and Lugs

- Several of our countries do not have a strong customer demand for primings ard remove/prime 3 - 4 leaves at topping
- This will change the form of the plant ard also the leaf style and appearance
- In primed crops first reapings will fall into lug styles and will not have thin trashy pr ming styles
- Grading will remain standard based on plant position and reapirg numbers

Cutters

Leaves 5 - 9

Leaf

Leaves 10 - 15

Tips

Leaves 15 - 18

Plant Positions

NTRM

There have been warnings to our growers all season. Baling is the last chance they will have to make sure they sell a clean crop.

Keep all forms of plastic and feathers away from tobacco.

Tying Hands

- Never mix grades when tying
- Leaves should be held together in a bundle about 3 cms across or the size of the thumb and finger in a circle
- Use a tie leaf of the same grade and wrap it neatly around the butt ends for about three fingers
- Tuck the end firmly into the centre of the hand
- Keep hands neat and all of the same size

Baling

- Baling areas must be kept clean. Scrap must be swept up after every bale is completed, this will help control any NTRM which may fall out of the leaf
- There will be different bale requirements for each country
- Make sure the bales fall within regulations regarding weight, tying with string or packing into hessian wraps
- Check for condition, grading and NTRM as each hand is baled

Bale Handling and Storage

- Never stack bales too high and try to stack on edge
- Handle bales with care when loading/unloading trucks
- Ensure they do not get rained on
- Get baled tobacco to your market as scon as possible
- Do not allow hessians to become stained with fertilizer, diesel or any chemicals. Clean trucks out before loading

Common Presentation Problems

- Mixed hands in the same bale
- Mixed leaf lengths or plant positions in the same hand
- Green or sponge mixed with good leaf styles
- Mouldy, stained or wet tobacco
- Badly tied large hands
- Tie leaf of different grade to the hand
- Plastic, feathers or any form of NTRM
- Scrap mixed in with leaf in the bale

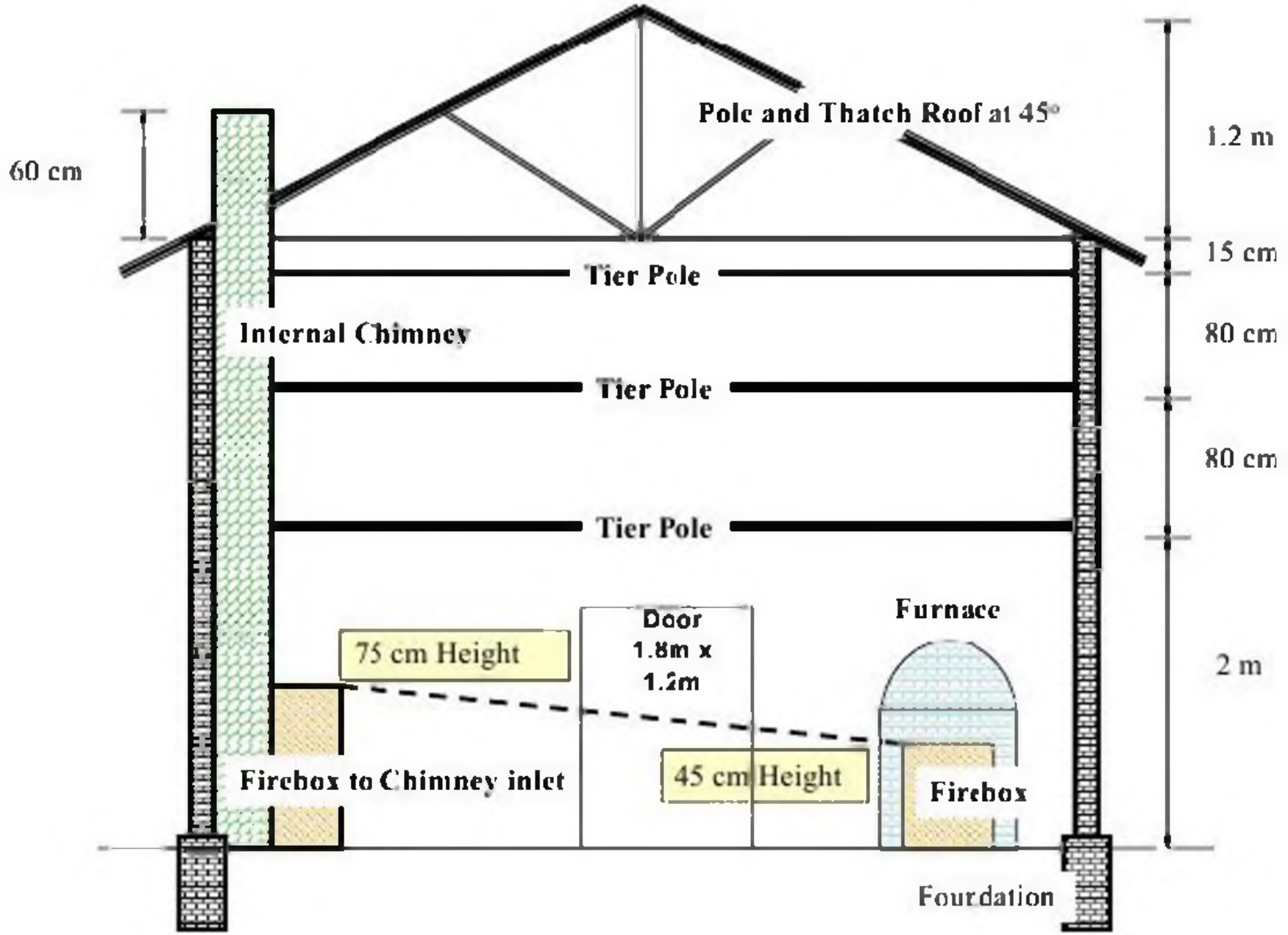
Tobacco Recovery and Loan Repayment

- The end of the season when crops are sold and the growers are rewarded for their hard work should be a happy occasion, unfortunately dishonest farmers often ruin this time
- The Company or financial supporter will have supported the grower for a whole season he must demonstrate his loyalty and commitment by selling the whole crop to the Company and paying his debt
- Growers must be clear that they have a legal obligation to the Company/financial supporter and that stern action will be taken against side marketing and failure to repay loans. **The Company must recover all tobacco and effect full debt repayment – if this is not done there will be serious consequences for the Company and the grower**

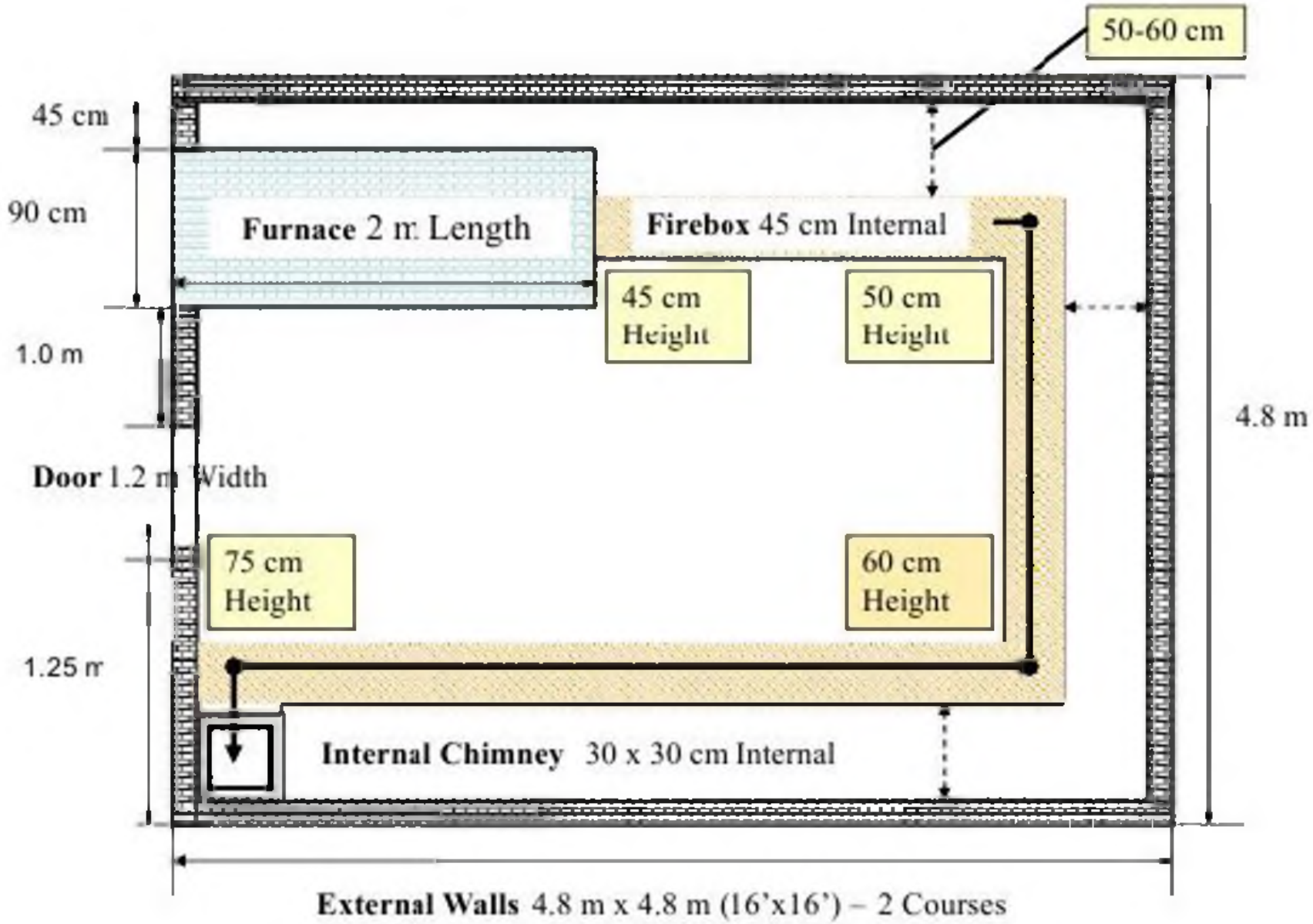
Total NTRM Control is

Good Agricultural Practice

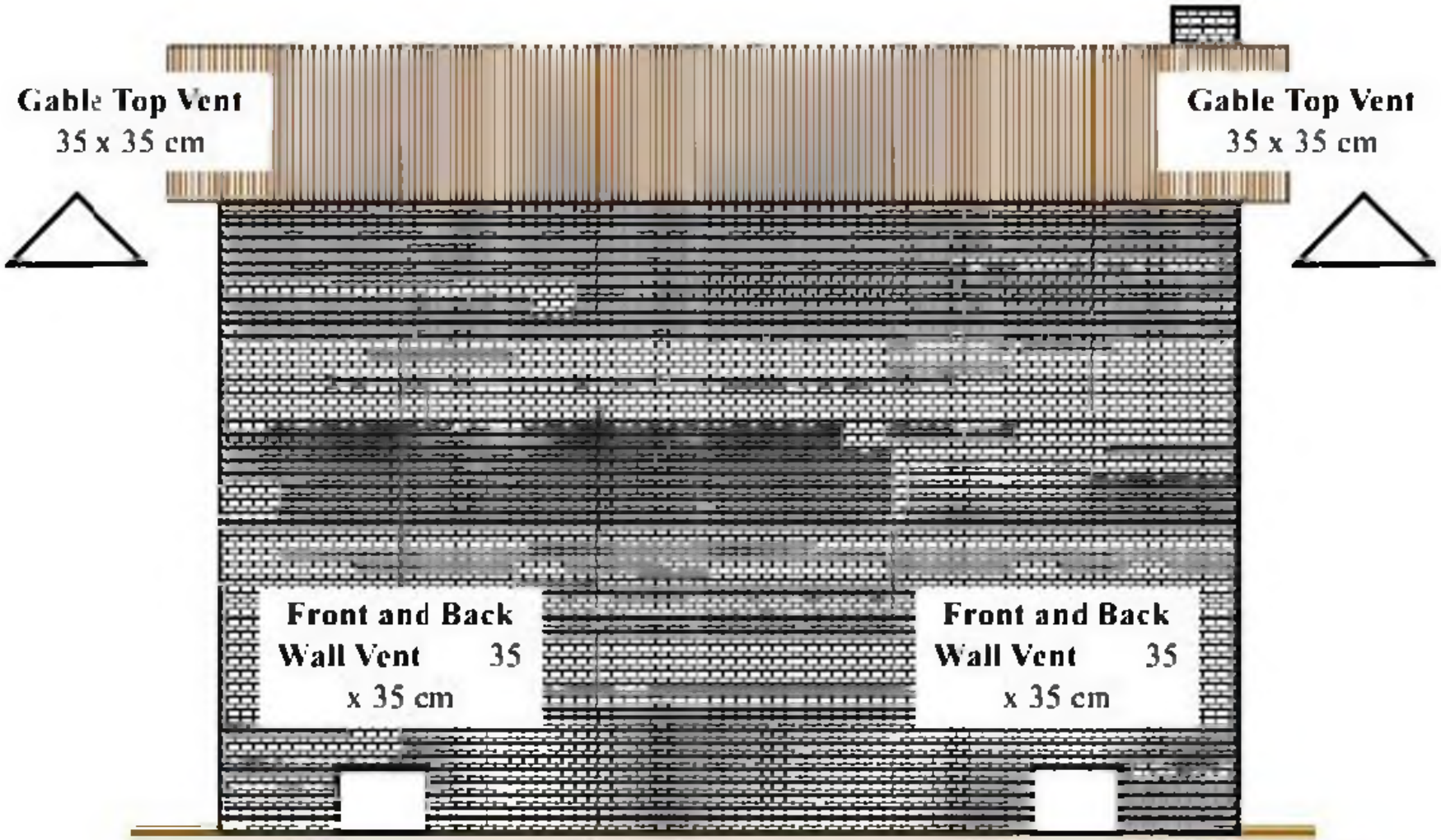
Half Hectare (8000 Plants) Side Plan for 4.8m x 4.8m (16'x16') Flue Cured Barn



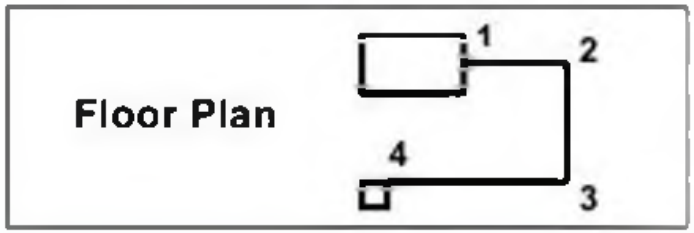
Half Hectare (8000 Plants) Floor Plan for 4.8m x 4.8m (16'x16') Flue Cured Barn



Half Hectare (8000 Plants) Vent Plan for 4.8m x 4.8m (16'x16') Flue Cured Barn

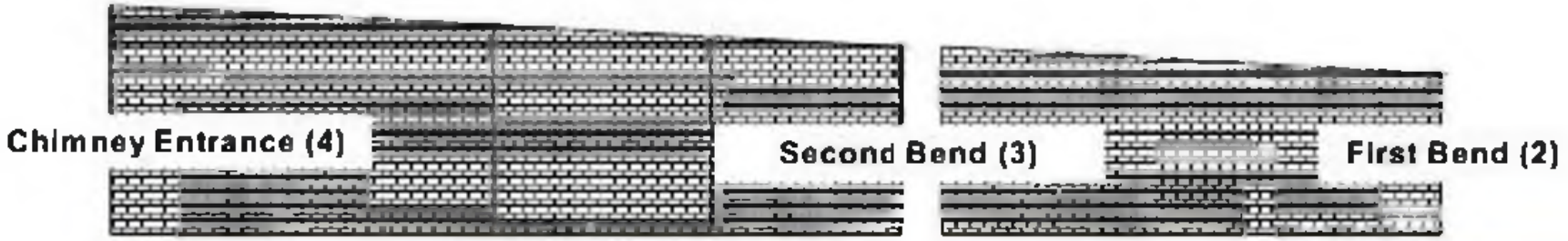


Flue Cured Barn Side View Furnace to Firebox to Chimney Plans



Firebox Roof must be at the Top of the Furnace Arch or about 6 Brick Courses (1)

Rise of One Brick Course from Furnace to First Bend (2)



Rise of One Brick Course from Second Bend to Chimney Entrance (4)

Rise of One Brick Course from First Bend to Second bend (3)