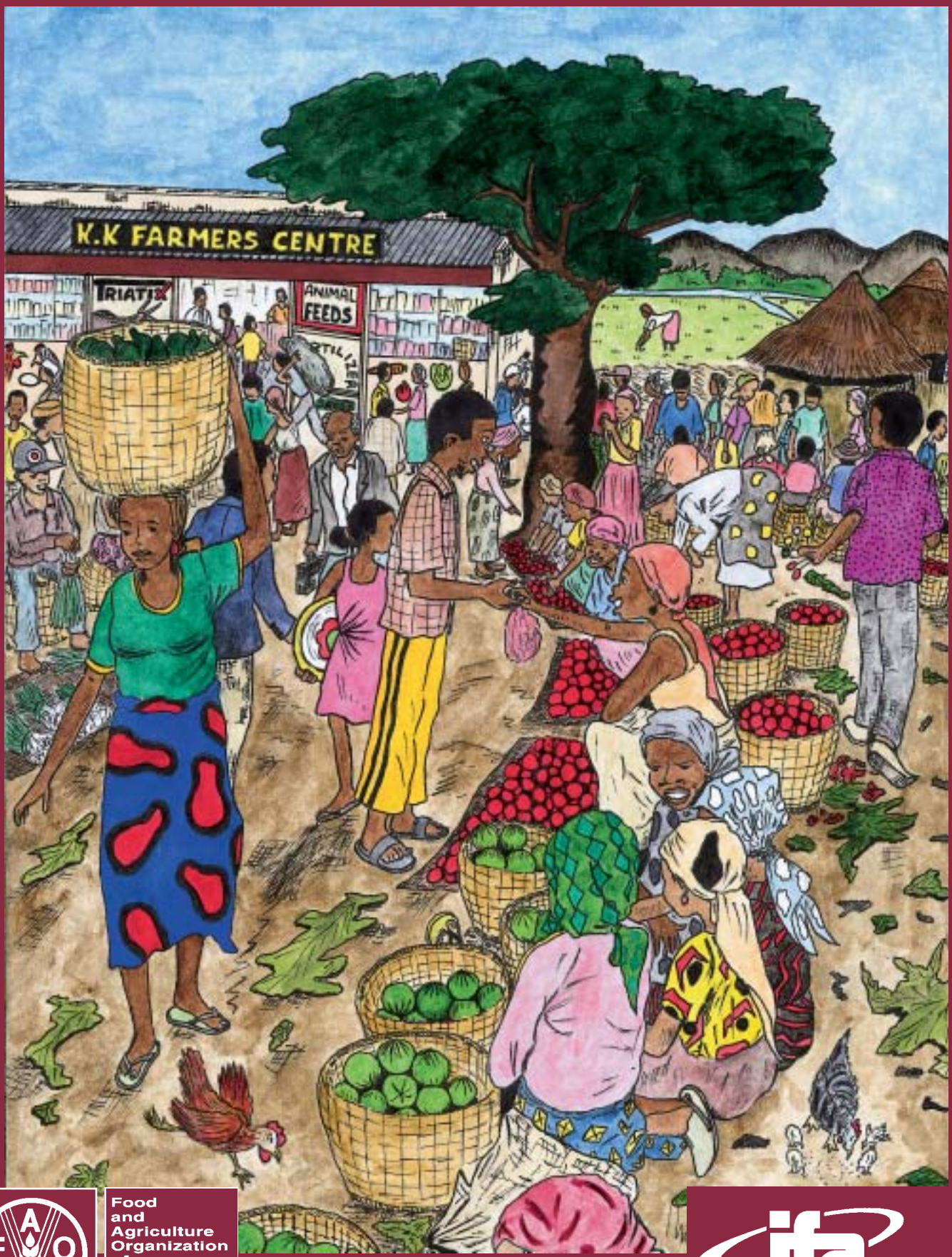
Fertilizer Retailing Guide



Food and Agriculture Organization of the United Nations

International Fertilizer Industry Association

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Food and Agriculture Organization of the United Nations

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This guide is for all fertilizer retailers whether they are private individuals or companies or work with cooperatives or government agencies. The text consists of answers to questions posed by a retailer.

The topics discussed include advice on running a fertilizer business, with particular emphasis on ways of controlling costs, the economics of using fertilizer, ways to promote fertilizer sales, characteristics of fertilizers, storage and handling, and the use and application of fertilizer.

Table of Contents

Preface

Until recently, government marketing boards or similar organizations were responsible for fertilizer marketing in most countries of Africa. Exceptions included Zimbabwe, where fertilizer has always been supplied by the private sector and Kenya where the private sector has played a leading role for many years. However, the situation is now changing and most state-run fertilizer distribution companies have been, or are in the process of being, privatized. In some countries progress towards this has been relatively slow, but the general trend is for governments to end their involvement in the fertilizer market.

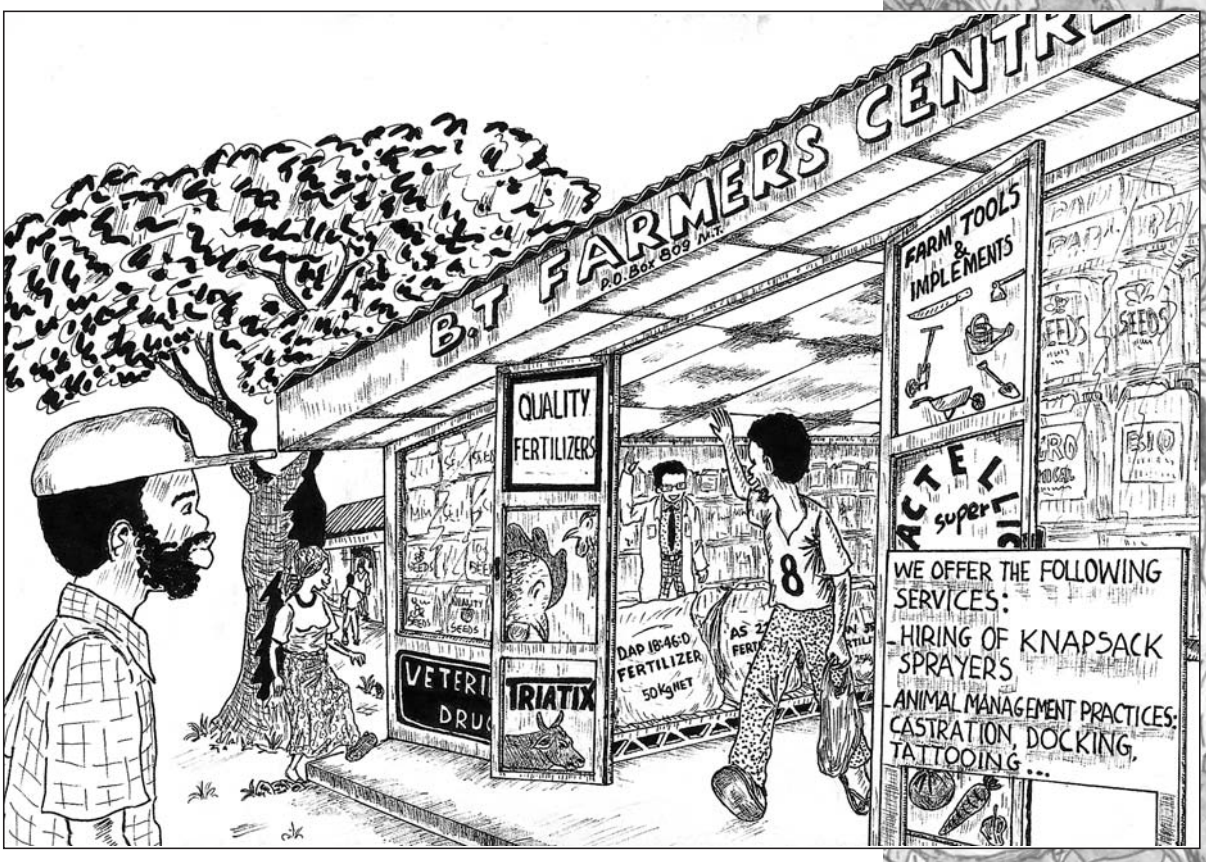
Fertilizer marketing is being privatized at a time when it is more and more difficult for farmers, particularly smaller-scale farmers, to purchase the product. In the old days governments often subsidized fertilizer and/or provided cheap credit. Such subsidies are coming to an end. Another influence is the fact that export crop marketing boards are also being closed down. These boards used to distribute inputs to farmers and collect payment when they purchased the crops. Private traders in cash crops, who are now taking over from marketing boards, cannot supply inputs in this way, because they will always be worried that the farmer will sell to someone else.

In the past, government fertilizer companies and export crop boards simply decided on how much of what type of fertilizer should be distributed to where. Distribution to farmers at local level was carried out in many different ways. In some countries local offices of the Ministry of Agriculture were responsible: in others distribution was done by cooperatives. Frequently, this was done in association with the national agricultural development bank, which provided credit. Rarely were private-sector traders responsible for retail sales to farmers.

This situation is now changing. In most countries the pattern that is gradually emerging is one of private retailers, supplied by private distributors, becoming responsible for sales of fertilizer and other inputs. But very few of the new retailers have much experience in fertilizer marketing. This Guide is designed to help them learn, both about the fertilizer they are selling and about how best to run their businesses.

Among other things, the Guide looks at how the retailer should choose which company to buy his or her fertilizer from; how to forecast demand; how to handle and store fertilizer; how to promote fertilizer and the particular brand he or she sells to farmers; and how to advise farmers on the use of fertilizer.

Managing your Fertilizer Business



Question

How can I estimate my sales for the coming season?

Answer

Most important of all is to talk to farmers to find out their plans. Are they planning to grow new crops which need different fertilizers? Do they have cash available to buy fertilizers this year, or will they have to rely on credit? If the latter, where will that credit come from? Do farmers have irrigation or do they depend on the rain? If they don't have irrigation, are they worried about a possible drought which would make using fertilizers risky?

Farmers will probably have difficulties in getting credit. However, you should talk to the local banks to see what their plans are and if they are expecting to give out more credit this year than last. Certain NGOs (Non-Governmental Organizations) sometimes provide credit.

After taking all of these points into consideration you can then use your last year's sales as a starting point in estimating what you might sell this year. But you will also need to consider whether there are any other fertilizer suppliers in your area, particularly if they are new. How much do you think they will sell and what effect will they have on your own sales?

Question

What about crop and fertilizer prices?

Answer

Under the old system, both crop prices and fertilizer prices were often set by governments. These days prices are determined by market forces. In many cases, the past arrangements meant that farmers knew in advance what they would get when they sold their crops. As they also knew the fertilizer price it was fairly easy for them to work out whether to use fertilizer or not.

That is no longer the case. Thus farmers in many areas now face two major risks; the risk that bad weather will cause a poor crop and the risk that the crop will be good but prices will be poor. This can make them very reluctant to spend money on fertilizer unless experience has shown them that in most years fertilizer application is profitable.

The price at which farmers can sell their staple food crops depends mainly on the quantities produced in a country and, of course, these will not be known until harvest time. So farmers' decisions on whether to buy fertilizer for food crops will probably be based on the price of that fertilizer. If prices are going down you could expect sales to go up, and vice versa. Sales of fertilizer for export crops are more likely to be based on the market price for the crop. If prices of those are going up farmers are likely to spend more on fertilizer.

Question

Answer

How much should I order?

The decision on how much to order is a complex one. On the one hand you do not want to order more than you will sell, or you may be stuck with expensive stock for another year. On the other hand, you do not want to order less than you can sell, because you will lose sales on which you could make a good profit. If you are the only retailer in your area you will also upset farmers if you don't have enough fertilizer available for them to buy.

Look into the previous year's records for the same period and order the amount necessary to keep enough stock to meet demand for each type of fertilizer throughout the crop calendar. Always keep in mind the capacity of your store and the speed with which you can get new supplies. Do not order more than you have room for or more then you think you can sell. How quickly could your supplier deliver new stock if demand proves to be higher than expected?

Question

Answer

Who should I order from?

When fertilizer was marketed by governments this question rarely came up. There was only one supplier. In many countries that is no longer the case and there are now several companies producing or importing a variety of fertilizer types and brands. As a retailer you will have to choose whether to buy from just one supplier or from more than one. If you buy from just one company, that company may agree to give you exclusive rights to sell its brand of fertilizer in a particular area. That means that if a farmer wants to buy ABC fertilizer because she or he thinks it is the best, then she or he can only buy it from you. Also, buying from just one company means that you can negotiate discounts for ordering large quantities, something you could not do if you bought small quantities from several different suppliers. On the other hand, if you agree to buy only from ABC and that company runs out of stock, you may not have enough fertilizer for all your customers.

An important point to think about is the brand names of fertilizers that farmers are aware of. If they are used to buying urea sold under the ABC brand name and have had no problems with this urea in the past, then they will probably want to buy ABC again. If you agree to sell XYZ fertilizer, which has never been sold in your area before, you run the risk that farmers will be suspicious of it. You could ask the XYZ company for a special introductory discount in order to sell its fertilizer and also insist that it does advertising and runs a promotional campaign in your area.

Question	Answer
What could I do to reduce the purchase price of fertilizer?	An association of retailers may be able to group orders and negotiate lower prices from suppliers by purchasing larger quantities. You could contact other retailers in your region to investigate the possibility of doing this.

Question	Answer
When should I plan for the fertilizer to be delivered?	If you have to borrow money from the bank to pay for fertilizer, you will have to pay interest on the loan. The shorter the period of the loan the better it is for you. On the other hand, you do not want to leave ordering so late that the fertilizer is not delivered until after farmers need it. Some companies offer discounts if you place an order, and they can deliver, early in the season. This is an advantage for them, as if all retailers expect delivery at the same time the companies will have big problems in arranging transport. However, you will have to calculate whether the discount the company offers is greater or less than the extra interest you would have to pay to the bank for a longer term loan.

Question	Answer
What preparations should I make for the coming fertilizer season?	Ensure that you have sufficient stocks of the recommended fertilizers for your area. Next, let farmers know that the products they need are available. Make use of local or rural radio stations for this purpose. Where possible, visit farmers to encourage them to make their purchases as early as possible and to tell them about the fertilizers, particularly new types (e.g. a new compound for a particular crop), and the recommended application rates. Farmers are more likely to buy from you if you are knowledgeable and can provide them with advice. Talk to the local agricultural extension advisers so that they, in turn, can tell farmers about your fertilizers. Hand out any publicity leaflets provided by your fertilizer company.

Question

How can I attract farmers to my shop?

Answer

Make sure it is always clean, well-stocked and well looked-after. You can also put advertisements up. Posters, banners and hoardings are ways of attracting attention to you and the products you sell. You should also clearly display prices for each type of fertilizer. It is good to sell other products that farmers need and to offer services such as the hiring of knapsack sprayers. Display bags of fertilizer in front of the store in order to inform and attract new customers. Work closely with governmental and non-governmental advisory agencies in your locality. Provide them with small quantities of fertilizers, 0.5 kg or even less, that they can sell, on your behalf, to small-scale farmers. If the farmers are advised properly, they will return to your shop to purchase larger quantities.

Question

If I don't know the answer to a farmer's question, how can I put him in contact with the extension officer, who is often not available because of other duties?

Answer

Why not make an agreement with the extension officer and put a poster up, saying that he will spend a few hours each week at the store to answer farmers' questions. This would also be a very good way to promote your fertilizer sales.

Question

Answer

How else can I increase my sales of fertilizer?

If your profit margins permit, consider giving discounts to farmers making early purchases, as this makes space available in your store. You could also give discounts to farmers buying larger quantities. For many farmers, credit is important and necessary. You could discuss with your supplier the possibility that he could give you credit so that you, in turn, could give credit to your customers. You could also consider an arrangement whereby you give credit to the farmer, agreeing to take part of his crop in payment.

Under earlier government-run credit programmes, repayment rates were often very poor. It was common for farmers to default on their loans, which is one reason why so many agricultural development banks have run into problems. However, if farmers do not pay back your loans to them you will go out of business. So you must be very careful and only make loans in the form of fertilizer to farmers you know and trust.

Where farmers know and trust you, it may be possible to encourage them to open savings accounts with you when they sell their crops, so that they will have enough money to buy fertilizer for the next season. This approach may work best in areas where there are no local banks or village-based savings groups. Be extra careful if you are taking savings deposits from farmers. It is their money, not yours.

In the long run, your business will expand as the local economy grows. Work with the extension service to identify new crops which farmers can produce. In the past some governments heavily subsidized basic food crops such as maize and sorghum. Now that these are no longer subsidized, farmers are looking for new crops to grow which can earn them better returns. Often, these crops require greater applications of fertilizer, which is good for your business.

Question

Answer

What about banks?

You should discuss with your local bank the possibility that you could supply inputs to farmers receiving credit. This may involve the farmer bringing you a voucher issued by the bank. After giving him the fertilizer, you would send the voucher to the bank and it would pay you. Cooperation with banks is essential to ensure that enough fertilizer is available for all those farmers receiving credit.

Question

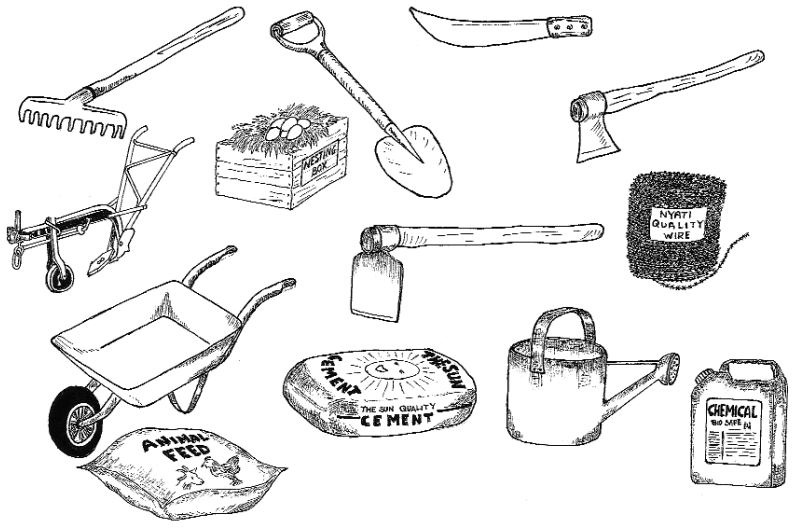
Answer

What other products can I sell?

To get high yields, farmers need other items besides fertilizer. You can sell good quality seeds, farm tools and implements. Where agro-chemicals such as pesticides and herbicides are needed, you should be able to inform farmers on correct ways of using and applying these chemicals.

Talk to farmers and find out what items they have difficulty in obtaining. Perhaps they use mechanized equipment but there is no spare parts stockist in your area. Could you stock a range of basic spare parts? Perhaps they have difficulty in obtaining building or fencing materials. Could you sell cement, wire, etc?

These are some of the products you could sell to make your shop more interesting to farmers and increase your profit



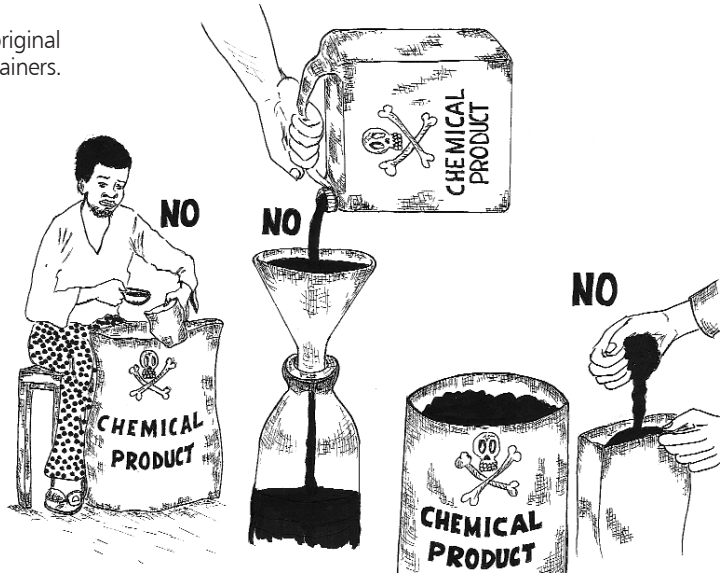
Question

Answer

Do I need to take special precautions if I sell agro-chemicals?

Always buy these products from reputable distributors. Make sure that the products, when delivered, are in the original packaging and that the seal is intact. Certain agro-chemicals are poisonous for humans and should be handled with great care. Make sure that the instructions on the labels are always followed. Ensure that all the packages or containers are in good condition and tightly sealed. Lock them away in a safe place, preferably in a separate room. For shop display purposes, use only empty containers. Only sell chemicals in their original containers. Do not break open a container to repackage the contents. If farmers complain that containers are too large, ask your supplier for smaller containers.

Only sell agro-chemicals in their original packaging. Do not open the containers.

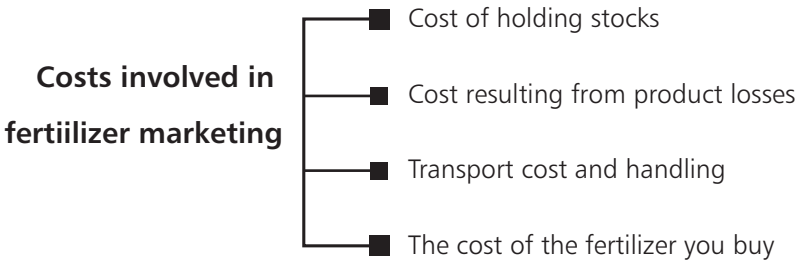


Question

Answer

What are the marketing costs which can affect my profitability?

There are many different costs involved in fertilizer marketing to which you need to pay attention in order to increase your profits:



Question

Answer

What are stockholding costs and how can I reduce them?

These are the costs of borrowing money to pay for fertilizer from your supplier. The longer a bag of fertilizer is in stock, the more it costs. If you use your own money, the cost is the loss of interest that this money could be earning in the bank. The best way of reducing these costs is to make sure you do not order any more fertilizer than you can sell in one season. Keeping unsold fertilizer in your store for one year or more is very costly.

Question

Answer

How do I control losses?

You should pay close attention to losses, which can result from poor stock control, theft or bad handling. Simple precautions can guard against loss. Some are discussed on the next pages.

Question

Answer

How do I control stock to avoid losses?

Put simply, stock control is monitoring the movement of your fertilizer so that you are able to account for every bag that enters and leaves your store. To do this, make sure that the supplier delivers the number of bags you order and pay for and that the farmer takes away the number of bags he pays for. Check carefully the weight of bags received.

Always check the unloading of bags to make sure you receive the correct quantity

Question

Answer

Are documents important to guard against losses?

Yes. Insist that your supplier provides a Delivery Note. Check all deliveries against this document. You must also issue farmers with an Invoice and/or Cash Sales Receipt when you sell them fertilizer.

Example of a Delivery Note

Delivery N° **001431**

N P K Fertilizer

Supplied to: *The Modern Agriculture* Date: *1 February 2002*

Adress: *5, Market Place*

Véhicle n°: *NE 127*

Quantity	Unit	Detail
300	*BAGS*	*50 kg each 15-15-15*

Remarks:

Received:

Question

Answer

How should fertilizer stocks be recorded in fertilizer stores?

Each fertilizer stack should have a Tally Card which should show the stack number, the type of fertilizer in the stack, the date on which the fertilizer was received and stacked, and the numbers of bags which have been withdrawn from the stack. The Tally Card should be amended immediately each time bags are added to or withdrawn from the stack.

A typical Tally Card

Name of store: *The Modern Agriculture*
Type of fertilizer: *Urea*
Stack number: *6*

Date	Detail	Total
1 February 2002	*300 bags received*	*300*
2 February 2002	*-12 bags broken*	*288*
"	*+9 bags rebagged*	*297*
5 February 2002	*-20 sold*	*277*
17 March 2002	*-50 sold*	*227*
3 April 2002	*-100 sold*	*127*
16 April 2002	*-40 sold*	*87*
1 May 2002	*-30 sold*	*57*
7 May 2002	*-11 demonstration*	*46*
30 June 2002	*BALANCE*	*46*

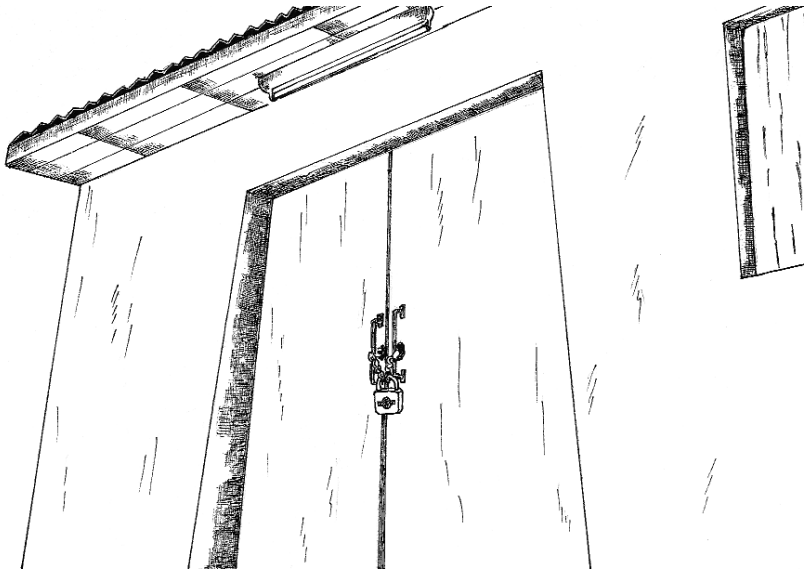
Question

Answer

How can I guard against theft?

Keep your stocks under lock and key. If your sales counter is in your store room, make sure that either you or a trusted employee is always present. When receiving fertilizer deliveries count the bags and check-weigh some of the bags to make sure there has been no pilferage. Check the closures and seams of bags for damage. Check your stock regularly to make sure the number of bags is what it should be. Reduce the chance of theft of money by regularly banking your receipts.

Always make sure your store is locked when there is no one around to watch it.



Question

Answer

And wastage?

Control wastage effectively by following the storage and handling recommendations in the next section of this guide.

Question

Answer

Is there anything I can do to reduce transport costs?

You may be able to negotiate the best transport rate from your supplier by ordering full truckloads at one time. If you use your own transport or hire a truck to collect the fertilizer, you can try to ensure that the truck travels as full as possible in both directions, so reducing costs.

Question

Answer

How can I reduce handling costs?

Normally, the handling costs per bag of fertilizer you sell will go down as the amount of fertilizer you handle goes up. Be careful not to employ too many staff. This is a common cause of high costs and low profitability.

Question

How can I work out whether income from sales is covering costs ?

Answer

You could work out a simple "Profit and Loss Account". To do this it is necessary to keep good records. It is important to include indirect costs such as costs associated with repairing the shop and store, as well as interest payments to the bank.

Working out a "Profit and Loss Account" enables you to see the profitability of your business

Profit and Loss Account 2000

	Expenditure	Income
Sales		
Fertilizer		6000
Seeds		500
Pesticides		500
Others		2500
Total sales		**9500**
Direct costs		
Stocks at beginning of 2000	2000	
Cost of goods bought in 2000	7000	
Total value of goods available	9000	
less value of goods in stock in 2000	2500	
Cost of goods sold in 2000	6500	
Gross profit (sales minus cost of goods sold)		**3000**
Indirect costs		
Manager's salary	1000	
Labour cost	500	
Interest payments to Bank	200	
Cost of maintaining the Store	300	
	2000	
Net profit		**1000**

Fertilizer Storage and Handling

Question

Answer

What is meant by the quality of fertilizer?

The quality of a fertilizer is related to its plant nutrient content, the chemical form of the nutrients it contains, its moisture level, the dust content and the hardness and size of its particles. Proper packaging is important to maintain the quality of fertilizer.

Question

Answer

How can I be sure that the fertilizer purchased is of good quality?

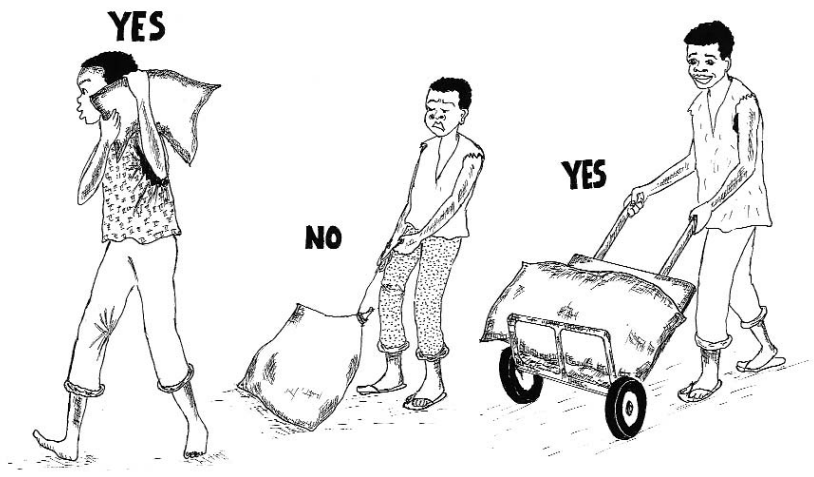
You should purchase well known brands of fertilizer. On taking delivery, inspect the bags to ensure that they are properly stitched and closed and that the fertilizer inside is dry and moves when pushed. Also, weigh a few bags to make sure they are the weight shown on the bag.

Question

Answer

How can I keep fertilizers in good condition?

The bags must be handled carefully. Do not allow workers to use hooks. Bags should always be carried, not dragged along the floor. They should be let down to the ground gently, not dropped. Stack bags properly and protect them against rain, humidity and sun.



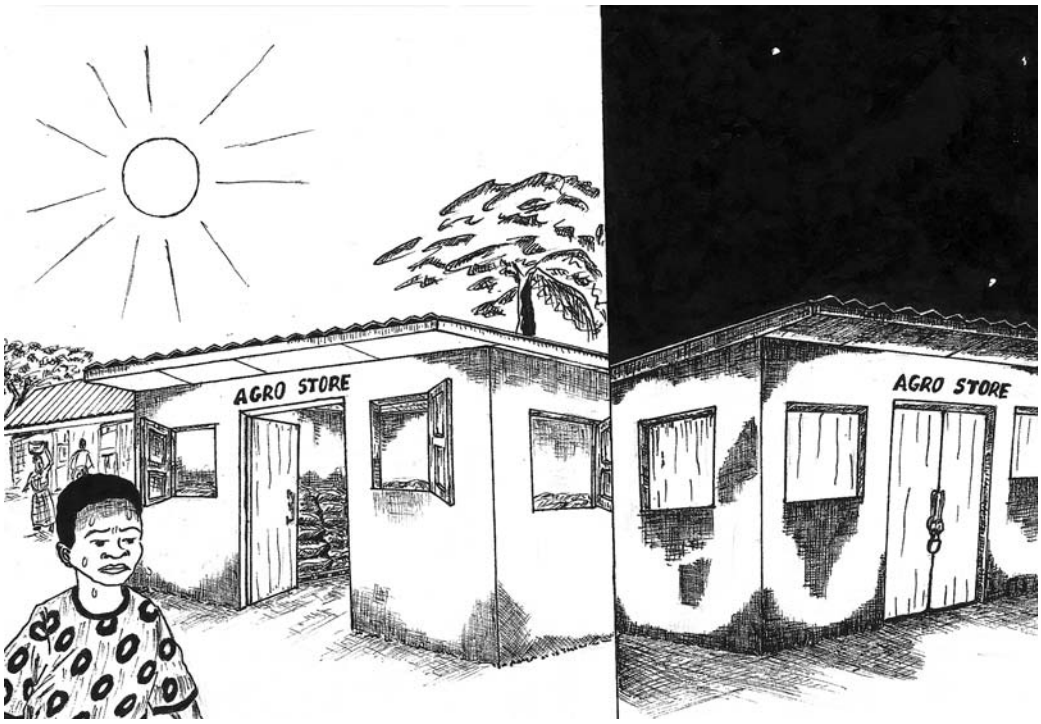
Correct handling reduces the risk of damaged bags and losses

Question

Answer

Can fertilizer be prevented from becoming damp in a hot and humid climate?

Provided fertilizers are stored and bagged well, the conservation of the quality of the fertilizer should not be a problem. However, there may be a problem with certain water-absorbing fertilizers in a hot and humid climate. To minimize dampness, the store should be well-ventilated when it is warm and dry outside. When it rains and during the evening when the humidity is highest, the windows and doors should be closed.



Ventilate the store when it is dry outside

Shut all doors and windows at night

Question

Answer

What causes damage to fertilizer bags?

The main causes of damage are (1) the use of hooks, (2) dragging bags along the floors of stores and lorries where sharp objects may make holes in them, (3) dropping bags from a height, (4) allowing bags to become wet and dirty and (5) exposure to the sun, which weakens many plastic bags.

Question

Answer

What can I do if a bag is damaged?

If the hole is small, try to patch it up with a plastic sheet or another suitable moisture-proof material. If the bag is badly damaged, re-bag the fertilizer and sell it at a reduced price.

Question

Answer

What can I do to store fertilizer well?

Make sure that the roof of the store does not leak, that the floor is dry and the building is clean. Sweep the floor often and clean up any spillage immediately. The bags should not come in contact with the floor, walls or ceiling. Do not throw bags in a pile. Stack them neatly. Make a separate stack for each type of fertilizer and pin a Tally Card to each stack so that you can keep an accurate record of movements.

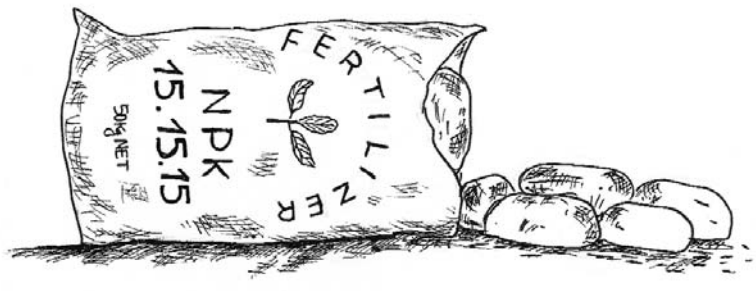
Question

Answer

What does caking of fertilizer mean?

Caking means that the fertilizer has hardened into lumps. This happens mainly because of poor storage. Caked fertilizer is very difficult for the farmer to use. Make sure you only accept delivery of good quality fertilizer from your suppliers. If lumps have formed in your store, you may sell the product at a reduced price. Lumps still contain all the fertilizer nutrients but they must be crushed before application.

Caked fertilizer cannot easily be used by farmers

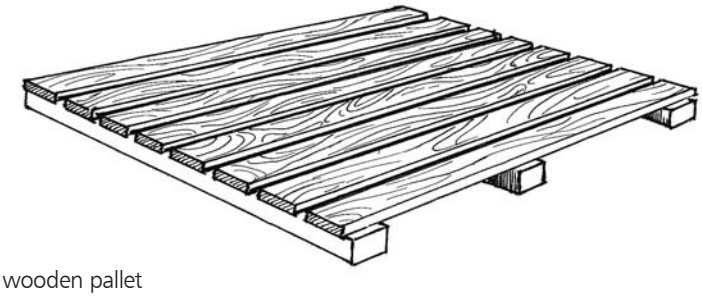


Question

Answer

What should be put between the bags and the floor?

Anything that will keep the bags off the floor and will not puncture them. Materials such as wooden planks and polythene sheets prevent the dampness of the floor from seeping into the bags. The best protection is provided by wooden pallets or planks because these allow air to circulate underneath the stacks.



A typical wooden pallet

Question

Answer

How can I make sure my fertilizer stocks are rotated?

Never order more than you think you can sell during one planting season. Make sure that the bags that came into your store first are the first you sell, particularly if you have bags left over from the previous season. This is called the "First-in First-Out" rule. Before accepting delivery of new stock, move old stock close to the door so that it does not get stuck at the back of the store. Do not put newly delivered bags on top of bags that are already in stock.

Question

Answer

How do I stack bags?

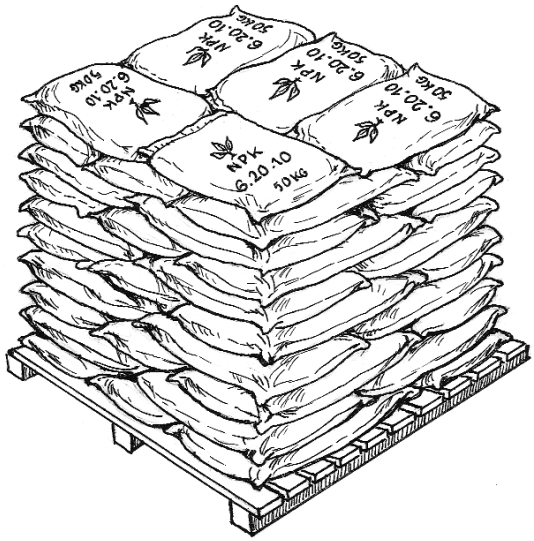
Be careful when stacking. Stack all bags in a criss-cross way. Don't simply put one bag on top of another. Do not stack bags too high. Bags that are not stacked properly may fall and break open.

Question

Answer

What else should I do?

Cover the stacks with plastic sheets to protect against dirt. Try to keep birds out of the store. Make sure the tops of all bags lie towards the centre of the stack, in order to protect the seams.



Stack bags so that their tops are facing inwards

Question

Answer

What height can the stacks be?

Do not stack bags more than shoulder height. Low stacks are better for the bags and the fertilizer. They also make lifting easier.

Do not stack bags more than shoulder height.

Question

Answer

Can other goods be stored near fertilizer?

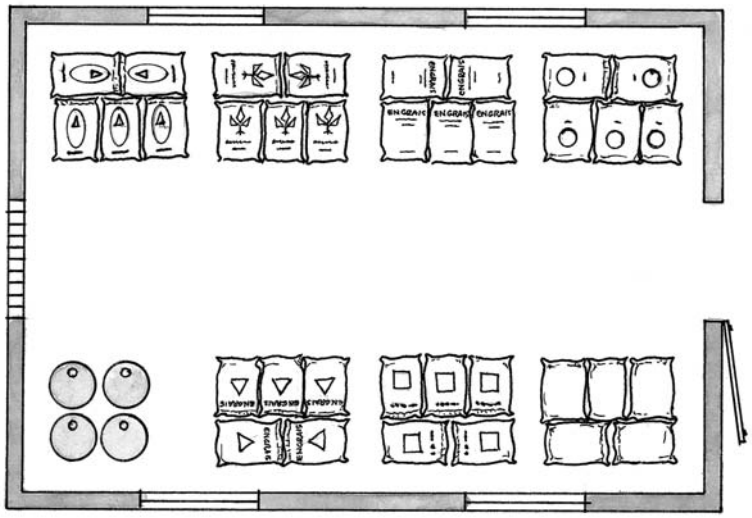
It is better to store food, grain, liquids or other goods separately. They may be kept in the same store when there is no fertilizer around. The store should be cleaned thoroughly before and after storing the other goods. Pesticides and other farm chemicals should always be stored separately.

Question

Answer

How large should the stack be?

This depends on the type of bagging material, the length of storage and, of course, the size of the store. Allow half a meter between stacks and provide an access passage way so you can reach all stacks.



Allow plenty of space around the stacks. Have separate stacks for different types of fertilizer.

Fertilizer Nutrients and Products

Question	Answer
What exactly are fertilizers?	Fertilizers are food for plants; they contain plant nutrients (nourishing substances) which all plants need to grow and stay healthy.

Question	Answer
What is the difference between a fertilizer and a soil conditioner or amendment?	Whereas the primary purpose of applying fertilizers is to provide plant nutrients, that of applying a soil conditioner or amendment is to improve the physical condition of the soil, in particular by correcting soil acidity or alkalinity. Acid soils are brought towards a less acid or neutral reaction through liming. Several kinds of liming materials may be used. Ground limestone is the most effective material. On alkaline soils, acidifying fertilizers such as sulphate of ammonia, ammonium nitrate or urea should preferably be used. On sodic soils, gypsum is a useful soil amendment. Gypsum may also be used to supply sulphur.

Question	Answer
What is a plant nutrient?	A plant nutrient is a mineral element that plants require as food for growth. There are sixteen elements that plants take from the soil. Nitrogen (N), phosphorous (P) and potassium (K) are used in relatively large amounts and sulphur, calcium and magnesium are also often required. Seven are sometimes required but in very small quantities. Three others have a beneficial effect on some plants but are not essential.

Question	Answer
Do all plants need these nutrients?	Yes, but different plants on different soil types need these nutrients in different quantities. For each plant to grow healthily, some quantity of each nutrient is necessary. The soil provides most of the nutrients needed but shortages can be overcome by using carefully chosen fertilizers.

Question	Answer
Why do farmers only apply some nutrients with fertilizer?	Some soils are rich in certain types of nutrients, so it would be wasteful to apply those that are already present in adequate amounts. Farmers need to apply only those nutrients that the soil does not have. In general, nitrogen, phosphate and potash are the nutrients most often lacking in the soil. They must be applied in larger quantities than the others.

Question	Answer
What are the sources of plant nutrients besides fertilizers?	Animal manures, composts and other animal and plant materials contain plant nutrients and also organic matter which benefits the soil. Certain plants fix atmospheric nitrogen which can be used for themselves and a succeeding crop. If these materials are available the farmer should apply them first and supply the remainder of the crop's requirements with fertilizers.

Question	Answer
What different types of fertilizer are there?	Fertilizers are either "straight" or "multi-nutrient".

Question

Answer

What are straight fertilizers?

Straight fertilizers are products containing one of the main plant nutrients. Some types are: urea, ammonium sulphate (AS), ammonium nitrate (AN) and calcium ammonium nitrate (CAN) which contain only the nutrient nitrogen (N); single superphosphate (SSP) or triple superphosphate (TSP) which contain phosphate (P_2O_5) and muriate of potash, which contains only potash (K_2O).

Question

Answer

What are multi-nutrient fertilizers?

Multi-nutrient fertilizers contain more than one of the main plant nutrients, e.g. di-ammonium phosphate contains both N and P. Mixed, blended, complex or compound fertilizers are also multi-nutrient fertilizers, containing various combinations of N+P+K, N+P, N+K, or P+K. These may be manufactured as granulated fertilizers or made by blending straight fertilizers. Multi-nutrient fertilizers are also known as mixed, complex or compound fertilizers.

Question

Answer

What do the figures printed on a fertilizer bag mean?

The figures refer to percentages of plant nutrients in the bag. The first number is the percentage of N, the second number is the percentage of P_2O_5 and the third number refers to the percentage of K_2O. For example 15-15-15 means that the fertilizer contains 15% of N, 15% of P_2O_5 and 15% of K_2O.

Question

Do the numbers printed on the fertilizer bag always follow the sequence N-P-K?

Answer

Yes.

Question

When a farmer wants nitrogen only, which fertilizer should he choose?

Answer

Urea (46% N), ammonium sulphate AS (21 % N), ammonium nitrate or AN (33% N) and calcium ammonium nitrate or CAN (up to 27% N) all contain nitrogen only. The farmer's decision on which one to buy will depend on the soil and crop, on the price per unit of plant nutrient, on the soil and, of course, on availability and preference. He must also, consider the application rates per hectare recommended by the extension services.

Some Important Fertilizers

	N Nitrogen	P_2O_5 Phosphoric acid	K_2O Potash	S Sulphur
	Percent of plant nutrients			
NITROGEN FERTILIZERS				
Ammonium Sulphate (AS)	21	0	0	24
Ammonium Nitrate (AN)	33.5	0	0	0
Calcium Ammonium Nitrate (CAN)	26	0	0	0
Urea	46	0	0	0
PHOSPHATE FERTILIZERS				
Single superphosphate (SSP)	0	15-20	0	12
Triple superphosphate (TSP)	0	46	0	0
Di-ammonium phosphate (DAP)	18	46	0	0
POTASH FERTILIZERS				
Muriate of Potash (MOP)	0	0	60	0
Sulphate of Potash (SOP)	0	0	50	18

Question

Answer

Which are some common phosphate fertilizers?

Some common straight phosphate fertilizers are single superphosphate or SSP, which contains 15-20% of P_2O_5, triple superphosphate or TSP containing up to 46% of P_2O_5 and natural rock phosphate for direct application which contains between 9% and 32% of P_2O_5. The level of availability of the phosphate to the plant in natural rock phosphate depends on the source of the rock and the acidity of the soil. Phosphates are also sold in combination with nitrogen and potash. Some examples of NP fertilizers are di-ammonium phosphate or DAP (18-46-0) and 20-20-0. There are several NPK formulas available.

Question

Answer

Which are the potash fertilizers?

Muriate of potash or MOP contains about 60% K_2O, while sulphate of potash or SOP contains about 50% K_2O and 18% of sulphur (S).

Question

Answer

Which other fertilizers besides sulphate of potash contain sulphur (S)?

Other common fertilizers that contain sulphur (S) in addition to primary nutrients are ammonium sulphate or AS containing 24% sulphur and SSP with 12% of sulphur.

Question

Answer

Can multi-nutrient fertilizers contain sulphur?

Yes. In areas where sulphur is required for the soil these are made available. They normally contain sufficient amounts of sulphur to provide for balanced fertilization.

Fertilizer Use and Recommendations

Question

Answer

Why do I need to know about fertilizer use and application?

The more useful information you can give the farmer, the more confidence he will have in you and the more likely he will be to buy fertilizer and other inputs from your shop.

Question

Answer

Where can I get such information?

Your main source of information should be your local agricultural advisers. Work closely with them.

Question

Answer

What other sources of information are there?

The Ministry of Agriculture may have leaflets and other material available. Farming programmes on the radio are useful sources of information. Fertilizer producers and/or dealers sometimes have training courses and leaflets, as do some non-governemental organizations (NGOs).

Question

Answer

What do I need to know about nutrient deficiencies?

In order to advise the farmer which fertilizers to apply, you must know which nutrients are deficient in the soils in your area. If N, P and K are all needed but the farmer wants just N, you will need to point out to him that he must also apply P and K for best results.

See back cover page: A deficiency diagnostics guide for maize.

Question	Answer
What are the benefits of adding nitrogen?	Applying N increases the number of branches, leaves, seeds and fruits and can improve overall crop quality.

Question	Answer
What are the benefits of adding phosphate?	Adding phosphate to the soil leads to better root development, and helps plants ripen early and mature quickly

Question	Answer
What are the benefits of adding potash?	The addition of potash to the soil improves crop yields and quality, strengthens plants and increases resistance to disease and drought.

Question	Answer
Can a farmer apply too much fertilizer?	Besides being uneconomic, excessive fertilizer use can damage crops, reduce yields and pollute the environment.

Question	Answer
Do fertilized plants need more water?	Fertilized plants grow quicker, bigger and stronger. Therefore, because of their size and health, bigger and better plants need more water.

Question	Answer
What is the effect of water on fertilizer in the soil?	Water dissolves the fertilizer. The nutrients are carried by the soil water to the roots of the plant. If there is not enough water in the soil, the nutrients cannot reach the roots of the plant, nor can they be absorbed by the plant.

Question	Answer
What is the time to apply fertilizer to obtain the best yield?	The "basal-dressing" should generally be applied at planting, and the "top-dressing" should usually be completed before the plant flowers. You should consult your agricultural advisers for precise information regarding crops grown in your area.

Question	Answer
What happens if fertilizer is applied at the wrong time?	Yields will be lower and the farmer will make less money. It is your job to ensure that fertilizer is available to the farmer in time so he can use it when needed.

Question

Is it true that the application of fertilizer will benefit crops in the following year as well?

Answer

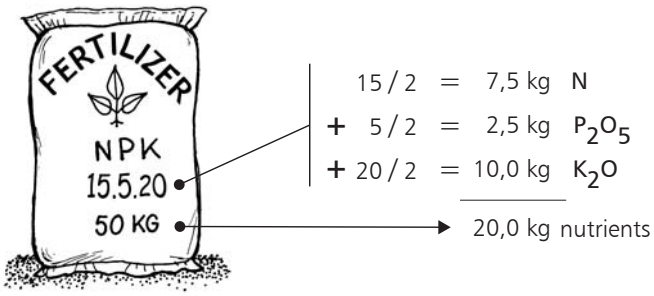
Yes. There is some benefit for the next crop as some of the nutrients will remain in the soil and fertilizer use generally benefits agricultural soils.

Question

What is the easiest way to calculate the weight of nutrients in a bag of fertilizer?

Answer

The easiest way is to divide the number printed on the bag by 2 for a 50 kg bag, or by 4 for a 25 kg bag. Thus, in a 50 kg bag of 15-5-20 the nutrient content of:



Bag	contents	N	P_2O_5	K_20	total	part
1/1	100 kg	15	5	20	40	1
1/2	50 kg	7.5	2.5	10	20	1/2
1/4	25 kg	3.75	1.25	5	10	1/4

Question	Answer
What are recommended rates?	These are rates of fertilizer application recommended by governmental extension services, international agricultural research institutes, private research organizations, fertilizer enterprises, and certain NGO and aid projects. The recommended rates depend on several factors, including the crop, the variety, the soil, the climatic conditions, etc. The recommendations are normally given in terms of the number of bags of a particular fertilizer needed for each hectare but they can also be given in terms of nutrients required per hectare or per unit area. For small plots, the recommendations may be in terms of the quantity of fertilizer to be applied to each planting hole or to a number of plants. Make sure that the quantity is adjusted according to the nutrient content of the fertilizer concerned.

Question	Answer
How many bags are needed to apply the recommended rate?	1. The extension officer recommends the application of 60 kg N per hectare in the form of urea, which contains 46% N. The quantity of fertilizer to be applied is as follows: 46 divided by 2 gives 23 (see above). 60 divided by 23 gives 2.6. Thus about two and two thirds bags of urea, a total of 133 kg urea product, should be applied per hectare. 2. A hectare is 10,000 m^2. So, for example, if the area of the field is 500 m^2 (square metres) the required amount of urea is one twentieth of that for one hectare, that is 6 ½ kg. 3. When the recommendation per hectare is 60-30-30, if he were to apply eight 50 kg bags of a 15-15-15 grade , the farmer would apply twice as much phosphate and potash as is needed. In this case he should apply only four 50 kg bags of 15-15-15 per hectare and thus half the nitrogen and all the phosphate and potash as a basal dressing. The remaining 30 kg N per hectare should be applied in the form of straight nitrogen fertilizer, normally top-dressed.

Question

Answer

What are recommended rates based on?

They are generally based on experiments conducted in farmers' fields. Using the recommended dose will provide good yields and cannot harm the crop or the soil. To get good yields, fertilizer must also be applied correctly and at the right time.

Soil and possibly plant analyses provide important information on plant nutrient requirements, particularly for phosphate and potash, and also on soil acidity or alkalinity.

Question

Answer

What happens if less than the recommended dose is used?

The yield and profit will be lower, but so would be the risk, if there is a danger of drought, disease or crop prices falling.

Question

Answer

What is a nutrient balance?

A nutrient balance is the difference between the quantity of plant nutrients supplied by fertilizers and organic matter and the quantity of plant nutrients removed by the crop or lost, for example, through erosion. It is very difficult to make a precise calculation of the balance but an approximate calculation may suffice to show whether the quantity of fertilizer being applied is too much or too little.

Question

Answer

What is precision farming?

Precision farming is the adoption of soil and crop management techniques which suit the different conditions found in each field. Very sophisticated techniques are used for this purpose in large-scale agriculture. However, small-scale farmers also can follow the same principle, for example by applying more fertilizer to areas of the field where response is high and less where response is low, according to their experience with the plot.

Economics of Fertilizer Use

Question

What factors influence the fertilizer price?

Answer

First in importance is the relationship between how much fertilizer is being produced and how much people around the world want to use. Other important factors are the cost of producing the fertilizer and the cost of marketing, including storage and transportation. The cost of transporting fertilizers to land-locked countries can be particularly high compared with the initial cost of the fertilizer. Fertilizer prices are also influenced by whether governments impose taxes or provide subsidies for raw materials, for the manufacture and/or on transport of fertilizers.

Question

Why are fertilizers that contain the same nutrients priced differently?

Answer

The price of fertilizer depends on its nutrient content and other product qualities. For example, one bag of urea contains more than double the amount of nitrogen found in a bag of ammonium sulphate and is therefore more expensive, although the cost per kilogram of nitrogen is usually less. Normally the price of the same type of fertilizer, for example urea, will not vary much between suppliers. In some cases, a company wanting to increase its sales may lower its prices to encourage farmers to buy its products. In other cases a company which sells a well-known brand may think it can charge more because farmers already know and trust its products. The way in which a distributor sets his prices will also have an effect. For example, companies may calculate the price they charge you by adding to the import price the cost of getting the fertilizer to your store and the profit they want to make. In this case the price they charge you will vary according to how much they paid to import the fertilizer and the exchange rate on the day they bought it.

Question

Is it difficult for farmers to calculate the amount of fertilizer that gives them the highest net return ?

Answer

Yes, very, particularly as crop and fertilizer prices change frequently and the season's growing conditions are not known in advance. However, after a few years' experience, farmers normally develops a good idea of how they can maximize their net income if growing conditions remain stable.

Question

Answer

Should the farmer always apply the rates recommended by the advisers?

Sometimes recommended application rates are based on research carried out on government farms and so are not always relevant to small farmers. Also, in some countries recommended rates were prepared at a time when fertilizer was heavily subsidized and what made economic sense for farmers in those days may not make sense now. You should check with the advisers to find out the basis for the recommendations. Farmers who have had several years' experience of using fertilizer get to know the application rates that make them the most money or minimize their risk.

Question

Answer

How can the economic benefits of fertilizer application be measured?

By estimating the net return. The net return indicates the income increase from selling the crop minus the cost of the fertilizer used to obtain the increase.

Value of yield increase
– Fertilizer costs
= **Net return from fertilizers**

The calculation should also take account of certain additional costs incurred by using the fertilizer, such of the cost of interest on higher working capital, additional labour and, possibly, higher post-harvest losses

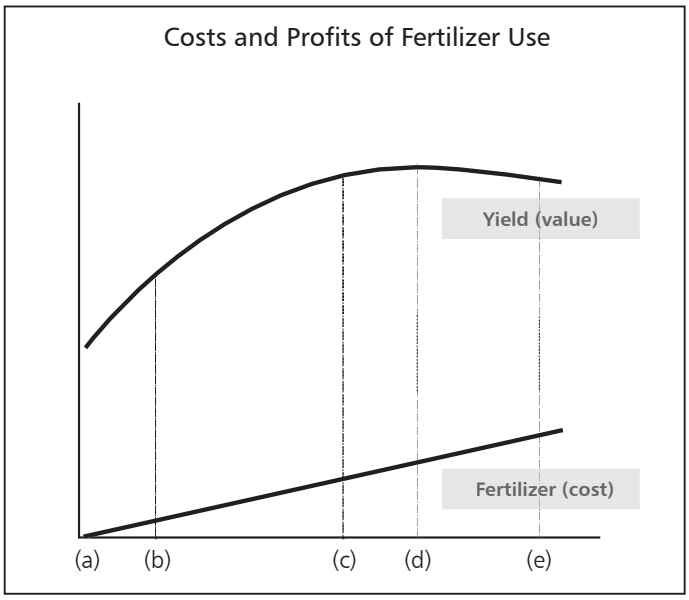
Question

Answer

What is the optimal level of fertilization?

The economic optimum rate of fertilizer use is the level that provides maximum profit as a result of fertilizer application. A number of factors affect the additional quantity of crop obtained thanks to fertilizers, especially the inherent soil fertility, the growing conditions (unknown), plant nutrients supplied from other sources and the farmer's skill. Under any given set of conditions the economic optimum depends on the relationship between the price of the crop (usually unknown) and, to a lesser extent, the cost of the fertilizer.

In order to determine the economic optimum it is necessary to carry out a series of field experiments. The results will be valid only for the crop and conditions of the experiments. Hence, determination of the economic optimum is expensive. However, some important conclusions can be drawn from experiments which have been carried out elsewhere. The following example is a typical response curve for cereals - the shape may be different for other crops.



This diagram illustrates that:

a) There is some yield even without fertilizer, the level depending on the fertility of the soil and the growing conditions. Then, as the rate of fertilizer application increases:

b) During the steepest part of the curve, the extra quantity of crop obtained per unit of fertilizer applied is greatest.

c) The most profitable level of fertilizer application, the economic optimum, normally occurs slightly below the maximum.

d) The yield is highest at the top of the curve

e) Beyond this point, the curve starts to descend, and yield and profit are lost, due to over-fertilization.

The farmer has a choice. He may choose:

a) Not to apply fertilizers but, unless other sources of nutrients are applied, the yield is likely to be low and the soil progressively impoverished, i.e. the quantity of plant nutrients removed in the crop and otherwise lost, for example through erosion, are not replaced.

b) If the farmer lacks the financial means or the crop is at risk due to natural adverse conditions, he can choose to obtain a high per unit quantity of fertilizer applied. However, apart from the loss of yield, there is still a risk that the quantity of nutrients removed will exceed the quantity applied.

c) At the economic optimum the farmer's profit and productivity are optimal for the nutrient in question. For this point to be at its highest possible level, the use of other inputs and management practices should be optimal.

e) Over-fertilization should be avoided.

It is in the farmer's interest to progress towards level (c) as he gains experience.

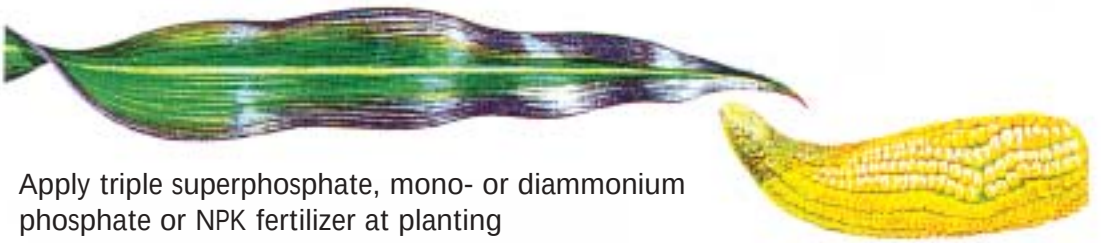
Summary

Do	Don't
Do make sure you can supply enough fertilizer of the right types to meet the needs of your farmers at the time they need it.	Don't order so much that you have to keep lots of fertilizer in stock for a long time.
Do work closely with your local agricultural advisers and with banks and other institutions that provide credit to farmers.	Don't give farmers advice without being sure that you are giving them the right information.
Do make sure that your shop is clean, well-stocked, attractive and secure.	Don't leave your store unlocked when there is no one around to guard it.
Do stock all products necessary for farmers to get high yields.	Don't store agro-chemicals carelessly. Keep them in separate areas.
Do reduce your costs by avoiding wastage of fertilizer.	Don't open and repackage agro-chemical containers.
Do put pallets or some other protection between the bags and the floor.	Don't allow workers to use hooks with bags or to throw bags to the ground.
Do control your stock by keeping records of its movement into and out of your store.	Don't store fertilizer in stacks above shoulder height.
Do check the weight of a sample of bags	Don't expose bags to rain or sun.
Do always sell old stock before new stock.	Don't accept damaged bags or caked fertilizer from your supplier.
Do learn about the different fertilizers and nutrients (plant foods) so you can better give advice to farmers.	Don't put new deliveries on top of old stock.
Do learn the recommended application rates.	Don't ignore your local extension officer. He can be a valuable source of information and you should work closely with him.Don't advise the farmer to use more fertilizer than he can use economically.

Nutrient deficiency symptoms of maize leaves and cobs Guide for the choice of the appropriate fertilizers in Western Kenya

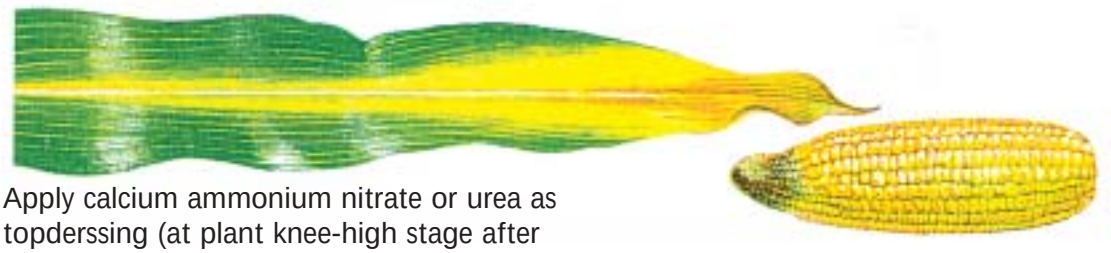
No nutrient deficiency

Phosphorus (P) deficiency



Apply triple superphosphate, mono- or diammonium phosphate or NPK fertilizer at planting

Nitrogen (N) deficiency



Apply calcium ammonium nitrate or urea as topderssing (at plant knee-high stage after weeding)

Potash (K) deficiency

Apply NPK fertilizer at planting

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