

**GOD IS  
PROVIDER**

**Farming**

**Year 8**

**Term 1**

**Thinking Skills Provider Yr 8**

<p><b>Agricultural science 1</b></p> <p>Create a new piece of farm machinery and explain what it does.</p>	<p><b>Agricultural science 2</b></p> <p>How many ways can you:</p> <p><b>plant a seedling?</b></p>
<p><b>Agricultural science 3</b></p> <p>Find 10 different uses for:</p> <p><b>a tractor.</b></p>	<p><b>Agricultural science 4</b></p> <p>Explain how farms could be completely different in 50 years time.</p>
<p><b>Agricultural science 5</b></p> <p>Consider 5 alternatives to this:</p> <p><b>Food has to be packaged after it has been picked from the farm.</b></p>	<p><b>Agricultural science 6</b></p> <p>You need to harvest wheat by combining:</p> <p><b>a computer</b></p> <p><b>a cutting device</b></p> <p><b>a vehicle</b></p> <p>Draw your invention and explain how it works.</p>

Thinking Skills Provider Yr 8

<p><b>Agricultural science 7</b></p> <p><b>When food is not sold it needs to be given to the poor and needy.</b></p> <p>List 5 advantages and 5 disadvantages of this statement.</p>	<p><b>Agricultural science 8</b></p> <p><b>A farmer goes into his hen house one morning and finds that every single one of his hens has gone.</b></p> <p>List 10 different explanations for this.</p>
<p><b>Agricultural science 9</b></p> <p>The answer is</p> <p><b>'God is Provider'.</b></p> <p>Write 5 questions.</p>	<p><b>Agricultural science 10</b></p> <p>Work out 5 ways to help a nation that has less than we do.</p>
<p><b>Agricultural science 11</b></p> <p>Name 5 things that</p> <p><b>fertile soil</b></p> <p>and</p> <p><b>a cooking pot</b></p> <p>have in common.</p>	<p><b>Agricultural science 12</b></p> <p>List 10 things that you would not find on a farm 100 years ago.</p>

# George Mueller

## Biography

George Mueller was born 1805 in Germany, and died in 1898. He was a Christian evangelist who worked in England as the director of an orphanage. In the 1830s, George Mueller was disturbed by the number of homeless children throughout England. Although he himself had no money to provide for these children, he prayed for God's provision, and proved the faithfulness of God. He prayed for enough money to set up an orphanage, and without telling any one of the need, started receiving funds from various Christian people.

Here are some events that show how God provided for the orphans:

*"The children are dressed and ready for school. But there is no food for them to eat," the housemother of the orphanage informed George Mueller. George asked her to take the 300 children into the dining room and have them sit at the tables. He thanked God for the food and waited. George knew God would provide food for the children as he always did. Within minutes, a baker knocked on the door. "Mr. Mueller," he said, "last night I could not sleep. Somehow, I knew that you would need bread this morning. I got up and baked three batches for you. I will bring it in."*

*Soon, there was another knock at the door. It was the milkman. His cart had broken down in front of the orphanage. The milk would spoil by the time the wheel was fixed. He asked George if he could use some free milk. George smiled as the milkman brought in ten large cans of milk. It was just enough for the 300 thirsty children.*

George Mueller was not always a person of such great faith and good character. As a young boy growing up in Germany in the early 1800s, he often stole money from his dad. As a teenager, he sneaked out of a hotel twice without paying for the room. One time he was caught by police and put in jail. As a Bible college student, George loved going to bars, drinking, gambling, and being the life of the party. He also loved making fun of people, especially Christians.

One day, a friend invited George to go to an off-campus Bible study. He went only because he wanted to make fun of the Christians later. But to his surprise, he liked the Bible study. For the first time, he saw people who really knew and loved God. He attended each evening. Before the end of the week, he knelt at his bed and asked God to forgive his sins.

George's friends saw a change in him immediately. He no longer went to bars or made fun of people. He spent more time reading his Bible, talking about God, and going to church. Soon he found that his friends did not want to be around him anymore.

When George told his father that he had decided to become a missionary, his father became very upset. He wanted George to have a high-paying job and not be a poor missionary. He told George that he would not give him any more money for school. George knew he had to do what God was calling him to do, even if his dad didn't support him.

George went back to college without knowing how he was going to pay his tuition. He did something he thought was a bit silly for a grown man to do. He got on his knees and asked God to provide. To his surprise, an hour later a professor knocked on his door. He offered George a paid tutoring job! George was amazed! This was the beginning of George Mueller's dependence on God.

After finishing college, George was ready to begin his missionary work in London, England. But there was one problem: Germany required all healthy men to serve at least a year in the army. George wanted to get to his mission as quickly as possible; however, he became very sick. His illness was so serious that he almost died. It also made him unable to serve in the army. He was now free to go to England as a missionary.

George became the pastor of a small church in England. The church wanted to pay him a good salary from the money it received renting pews to rich church members who sat at the front of the church. (Poor members had to sit in the "cheap" seats in the back.) George told them that this had to stop if they wanted him to be their pastor. Even so, he did not allow the church to pay him a salary. He trusted God to meet his needs, and God did. George and his family never missed a meal and were always able to pay their rent. George began to sense, however, that God had something else for him to do.

Each day as George walked the streets, he saw children everywhere who had no mom or dad. They lived on the streets or in state-run poorhouses, where they were treated badly. George felt God calling him to open an orphanage to take care of the children.

George prayed, asking God to provide a building, people to oversee it, furniture, and money for food and clothing. God answered his prayers. The needs of the orphanage were met each day. Sometimes a wealthy person would send a large amount of money, or a child would give a small amount received as a gift or for doing chores. Many times food, supplies or money came at the last minute, but God always provided without George telling anyone about his needs. He just prayed and waited on God.

On December 7th, 1835, he wrote in his diary:  
'Today I received the first shilling for the orphan house. Afterwards I received another shilling from a German brother.'

On December 9th, he wrote:  
'This afternoon, the first piece of furniture was given - a large wardrobe.'

On the evening of the 9th he addressed a meeting, announcing the planned establishment of the home.

"The home will only be established," he said, "if God provides the means and suitable staff to run it."... "Under no circumstances," he continued, "will any individual ever be asked for money or materials."... "The institution will be for truly destitute children and any orphan

whose relatives are able and willing to pay for their maintenance will be ineligible. The children will receive a plain education. The chief and special end of the institution will be to seek, with God's special blessing, to bring the children to the knowledge of Jesus Christ by instructing them in the Scriptures."

As God continued to provide, George Muller eventually supervised the building of five large orphanages, housing thousands of children. This reminds us of the story of the loaves and fishes. The boy had only five loaves and two small fish. It seemed that the small amount of food was next to nothing compared to the amount of food needed. However, because the boy was willing to give, Jesus was able to bless and multiply the amount.

Sometimes Christians who decide to help the poor feel the same as the disciples did: so little food and so many to feed. However God can do great things when we are willing to give what we have. Something as small as a mustard seed can grow into a big tree.

More than 10,000 children lived in the orphanages over the years. When each child became old enough to live on his own, George would pray with him and put a Bible in his right hand and a coin in his left. He explained to the young person that if he held onto what was in his right hand, God would always make sure there was something in his left hand as well.

George Mueller provided excellent educational opportunities for the orphans. He established 117 schools which offered Christian education to more than 120,000 children, many of whom were orphans

His vision continues today as Christians around the world are inspired by his faith to depend on God to meet their needs and the needs of helpless children.

**Questions:**

What similarities are there between George Mueller's and the Apostle Paul in his decision to follow Jesus? How did George change after he became a follower of Jesus?

What did Mueller mean when he told the orphans to "hold onto the Bible in your right hand"?

Describe a time when God has answered your prayers and provided for you or your family.

What resources do you have that you could use to help others who might be in need of food or shelter?

# William Wilberforce

## Biography

William Wilberforce, born August 24, 1759, was the only son of Robert and Elizabeth Wilberforce of Hull, England. He was a delicate child, not very strong physically. From early childhood he showed compassion for others.

His grandfather was a merchant who imported hemp, timber, and iron ore and exported many products from Yorkshire. William had three sisters, but one died at age 8 and another at age 14. Only Sarah lived to be an adult.

When William was only 9 years old his father died and he was sent to live with his aunt and uncle, Hannah and William Wilberforce at Wimbleton. He was placed in a private school where he remained for two years. He received early religious training while living with them.

The evangelist John Newton was a good friend of the family. He visited in their home and William and his aunt and uncle also visited in the Newton home. He was a former slave-ship captain, but he forsook the trade and spent the rest of his life working to free the slaves and prevent further enslavement. Newton would conduct "parlor\* preaching" in his home for his family and guests.

William's mother was a socialite who enjoyed going to parties and the theater. William had been sent to Wimbleton when she became ill. When she was better she sent for him to come home. She was a member of the Church of England and became alarmed at the influence of these "Evangelical Methodists" on her son. She had other goals for him. She didn't want him to continue having contact with his aunt and uncle and the people he had met while staying with them. However, he continued to write to them without his mother's consent.

After returning home he began to drift away from his faith and by the time he went to St. John's College, Cambridge he embraced a life of partying and excess. He was very entertaining, sang well, and was a brilliant conversationalist. He had a lot of friends. While in college he had dinner parties in his room and invited his friends to come and enjoy food and wine with him. During this time, he made contacts with people who, like himself, would become well-known leaders in England. One of the people he met in college was William Pitt who would later become Prime Minister.

When he was nearly through college his grandfather and his cousin interested him in Parliament. William Pitt was the main impetus for his decision to enter politics. The family fortune made it possible for him to embark on such a career, and the associations he had made in college were helpful to him politically.

He campaigned in his hometown of Hull and received nearly every vote. He was only 21 years old when he was elected to Parliament in Hull. Three years later he was reelected as a Member of Parliament for Yorkshire. Wilberforce and Pitt remained friends even when William, to satisfy his conscience, had to vote against his friend.

A turning point in his life came when he made a tour of Europe with Isaac Milner, the younger brother of Joseph Milner who had been the headmaster of the grammar school he attended. They had long talks as they traveled together. William was convinced to devote his life to Jesus Christ and to the cause of the abolition of slavery in the British colonies.

He began to read the Bible and underwent a spiritual conversion. He regretted the way he had lived his life as a young man. He felt that he had wasted those college years by putting his main focus on partying and playing cards. He determined he would use his public office to bring about social change, mainly the freeing of the slaves.

When William was 37 years old, he met Barbara Spooner, a 20-year-old woman and fell in love with her. They had the same ideals and shared a common faith. They married after a very short courtship and within 10 years had 6 children. William was devoted to his wife and children.

In the 44 years he served in Parliament he never lost an election, but the cause he fought for, the abolition of the slave trade, was defeated 11 times before the Slave Trade Act finally passed in 1807. He had worked 20 years and had used his position in Parliament to bring about this change. The first victory the abolitionists had was the abolishment of the slave trade, but this did not make slavery unlawful. It made the shipment of slaves unlawful. This reduced the number of people continuing to be enslaved by about 75%. The bill passed by 283 votes for and 16 votes against.

Many British ships were used to transport slaves. Some people estimate that 11 million Africans were taken from their native lands and sold as slaves to work in the colonies. Rev. James Ramsay told William of the horrible conditions on the slave ships.

It would take another 26 years before slavery was abolished in the British Empire. In 1833 Wilberforce learned the bill had been passed only days before he died. Ten years later slavery was abolished in India, and in the United States the 13th Amendment freeing the slaves was enacted December 18, 1865.

William Wilberforce also worked for justice in other areas such as prison reform, workers' rights, prevention of cruelty to animals, and education. We learn much about him from journals he kept and letters he wrote to people.

Even though laws have been passed outlawing slavery, it still exists in some parts of the world today. Children are kidnapped by slave traders or, in some cases, sold by their poverty-stricken parents for as little as \$15. Some enslaved children work long hours without benefit of schooling or basic necessities of life. Some Christian organizations today exist for the purpose of buying back some of the children and this frees them from their owners.

<https://gardenofpraise.com/ibdwilber.htm>

**Look up these words in your dictionary:**

hemp, evangelical, devote, abolish, abolition



## **Animal Farming 1**

### **Dairy Farming**

<b>Student activities</b>
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Very early in the morning the cows are driven to the milking shed. Cleanliness is essential in the handling of milk. The farm workers scrub their hands before they begin and the cow's udders are washed. All equipment has to be sterilized.

Cows were once milked by hand, but now electric milking machines are used. Electrically operated suction caps are fitted to the teats of the cow. As these expand and contract they extract the milk from the udders. The milk flows along a tube into the can. In the tube there is a section made of glass through which the farmer can watch the flow of milk and see when the cow has been milked dry. These machines are thoroughly cleaned and sterilized after each milking.

When all the cows have been milked they are herded back to the pasture where they eat grass and chew their cud all day. In the evening they are taken to the shed to be milked again.

While the milk is still warm it is strained and put through a cooler, ready to be picked up by a refrigerated milk truck that takes the milk to be processed.

As soon as the milk arrives at the processing plant it is pasteurized, which means it is heated to a temperature of 75 degrees Celsius in 15 seconds, and immediately cooled down to freezing point within 25 seconds. This ensures that the milk is free of bacteria. By-products of milk are butter, cream and yoghurt.

1. Describe the dairy farmer's job.
2. What happens to the milk after it leaves the farm?

## **Animal Farming 2**

### **Meat production**

In the beginning God created wild animals and domestic animals. Domestic animals can be farmed and are very useful to us. In earlier times animals were hunted for food, and in some cultures, this is still done.

For those of us who buy meat at the shops, there are different kinds of meat available:

Beef, from cattle

Veal, from calves

Lamb

Pork from pigs

Venison from deer

Farmers who raise animals for meat start by buying female animals which give birth to young. The farmer cares for the herd, ensuring that the animals always have plenty of feed and water, until such a time when the animals are old enough to be sold for meat.

The animals are loaded on to trucks and taken to the abattoir. Here every precaution is taken to ensure that the meat is handled hygienically. The meat is graded and sent to the butcher's shops or supermarkets. Butchers know how to cut the meat into various "cuts" such as chops, steaks and roasts.

1. Describe the job of a beef or sheep farmer who raises animals for their meat.
2. What is the job of the butcher?

## **Animal Farming 3**

### **Egg and poultry production**

Poultry is the word used to describe the meat from:

- a) Roosters, hens and chickens (also called fowls)
- b) Drakes, ducks and ducklings
- c) Turkey cocks, turkey hens and chicks

A poultry farmer keeps poultry for either eggs or meat.

Fowls are kept in fowl runs. They should have ample space to walk around and scratch for food such as insects and greens. Hens that have space to do this are called “free range” and are much healthier and happier than hens that are confined to farm sheds or cages. Hens are raised in cages are given only pellets to eat and never see the light of day. Many animal activists are against this type of farming.

With both types of farming, nests are lined with straw, and the hens are fed pellets or wheat. A farmer that raises hens in a natural setting will have a rooster, and only one. If there is more than one, the roosters will fight. When a hen becomes “broody” she will want to sit on her eggs and be left in peace, waiting for her chicks to hatch.

Some chicks are hatched using incubators. The small chicks are put into a shed and have to be cared for by the farmer as they have no mother hen to look after them.

1. What is a “free range” hen?
2. What are the advantages of “free range”?
3. Why do you think some farmers choose to raise hens in cages?

## **Animal Farming 4**

### **Wool production**

Sheep are raised for many purposes. The most important reason farmers raise sheep is for their wool. This thick fibre coat is shaved off, or shorn, every year. It is used to make clothing, blankets, and other materials. Sheep can stay warm even on cold winter days thanks to their warm wool coat!

Shearing sheep is similar to cutting hair. Sheering is usually done in Spring. If sheep are not shorn they can suffer from over-heating in the hot summer months.

The fleece is sent to the woollen mills for processing. It is tangled and matted. In order to spin the wool into yarn, the fibres need to be running parallel to each other. This is done by carding, which is similar to combing. It is done by special machines. Once the wool is carded, it can be spun into yarn by twisting the fibres together.

Female sheep are called ewes, and males are called rams. Rams more often have horns, although there are some rams that are without horns, and there are some females that have horns!

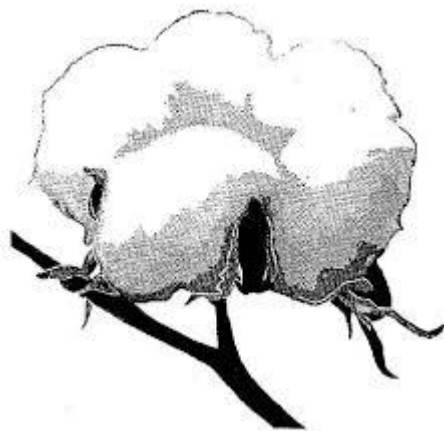
A sheep farmer has to make sure the sheep have plenty of grass to eat and water to drink. They also should provide shelter from the hot sun, by planting trees in the paddocks.

1. When would a sheep farmer have to employ extra labour?
2. Why is sheering necessary?
3. How is the fleece processed to make woollen yarn?
4. What are the advantages of woollen clothing?

## **Cotton 1**

### **The history of cotton**

Most people in Europe learned to make clothes from wool, but as the British Empire expanded to India, it was discovered that cotton grew there, and the Indian people made their clothes from cotton. Travelers who first visited India came home and told their people about “the little lambs that grew on the bushes”. They brought with them pieces of material made from these little lambs. They described these bushes to their people: the flowers on the bushes turned into pods covered with soft fluffy wool, which could be picked, spun into threads and woven into cloth. Some of these pieces of cloth were so fine that they were called “webs of woven wind”.



Explain how cotton first started to be used for clothing in Europe.

## Cotton 2

### The cotton plant

- Cotton grows only where the sun is very warm and there is regular rainfall. (There must be at least 200 days without frost after the seeds have been sown.)
- The plant grows from 1 to 3 metres high and has flowers. These are pure white at first; later they turn to a delicate pinks; finally they become a deep red.
- Inside the flower a round seed pod is formed. This is called a cotton boll and it is green.
- When the boll ripens it turns a dark brown. It bursts open to show a bunch of white downy fibre covering the seeds (about the size of a tennis ball).
- The cotton is a fluffy mass of hair-like fibres. On some plants these fibres are longer and finer than on others. Each single fibre is flat and twisted and it is because of this twist that the long fine thread can be spun.
- Fabric woven from cotton is cooler than silk or wool so better for clothing in hot countries.

1. What are the conditions for growth?
2. Describe the plant with flowers
3. What is a cotton boll?
4. The boll contains white fluffy fibre. What else does it contain?
5. Why is the twist important?
6. What are the advantages of cotton fabric?

### **Cotton 3**

#### **The story of cotton**

Make a summary of the following:

In the early days, cotton was carried in the ships of Arab traders and on the backs of camels to many countries around the world.

But when Columbus discovered America in 1492 he found the cotton plant growing there. This was probably one of the factors which convinced him that he had found the sea route to India.

The Indians gave him skeins of cotton in exchange for beads. He also took branches of the cotton plant home with him to Spain and gave them to King Ferdinand and Queen Isabella. Later, Cortez, the conqueror of Mexico, found the Mexican Indians dressed in brightly coloured cotton garments.

The Europeans who came to live in America began to grow cotton. Cotton grew easily in the South of the USA where it was warm. The biggest difficulty was to get the seeds out of the fibres. The bolls had to be torn apart and the seeds extracted with the fingers. This was difficult because the fluffy fibre clung tightly to each seed.

Then a young man named Eli Whitney moved from the North of the USA to the South, to take up a job as a teacher. He was interested in cotton and gave much thought to the problem of separating the seeds. Eventually he invented a machine called a cotton gin (1792). This was a box-like machine with rows of metal teeth and a handle. There was a hole at the bottom through which the seeds dropped. It was so successful that soon all the cotton farmers were made their own gins. This meant that large quantities of cotton could be cleaned in a short time. Soon the USA was the largest cotton producer in the world. Farmers became rich largely due to free labour through the slave trade. A Christian man, William Wilberforce battled to have the slave trade abolished, and it was finally abolished in 1808.

## **Cotton 4**

### **Cotton countries of today**

#### **Major cotton producing countries in 2014/15**

China: 33.0 million bales.

India: 27.0 million bales.

United States: 18.0 million bales.

Pakistan: 10.3 million bales.

Brazil: 9.3 million bales.

Uzbekistan: 4.6 million bales.

Australia: 1.9 million bales.

Turkey: 2.8 million bales.

Egypt: 1.5 million bales

#### **Quality of cotton**

Some of the finest cotton comes from Egypt. The flooding of the Nile Valley ensures well-cultivated soil, but the fields must be irrigated. The long fibres are easily handled and are woven into superior quality cotton cloth.

Good quality cotton of medium length fibres is grown in the valley the Mississippi River, USA

In India the plants are crowded together. The soil is poor and therefore the fibre is of low grade.

1. How much more cotton is produced in China than the USA?
2. Which country is the second biggest producer?
3. Name a country that borders Uzbekistan.



## Cotton 5

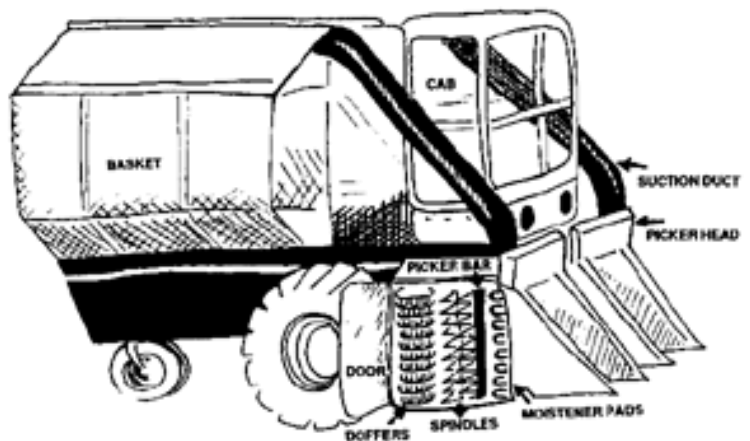
### Growing cotton

- The finest seeds are kept for planting.
- The cotton seeds are planted close together and the weak plants are thinned out.
- The soil around the plants is hoed and weeded.
- It takes 6 or 7 months of favourable weather for the plant to produce ripe cotton bolls.
- At one time all crops were picked by hand. Machines are used today for about 30% of the world's cotton production. Australia, Israel and the USA are the only countries where all cotton is picked by machines. Machine picking is increasing in Argentina and Brazil.

Write a description of your work, as if you were a worker on a cotton plantation.

How would you harvest the cotton on a plantation in India?

Draw two pictures: one showing harvesting by machine, the other showing harvesting by hand.

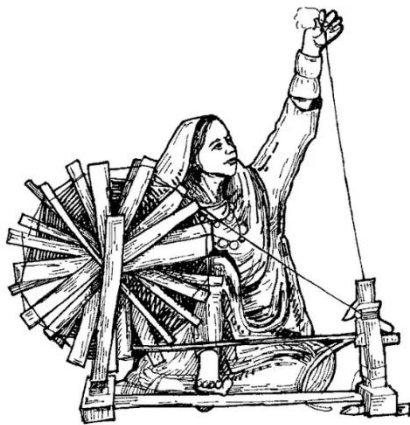


## Cotton 6

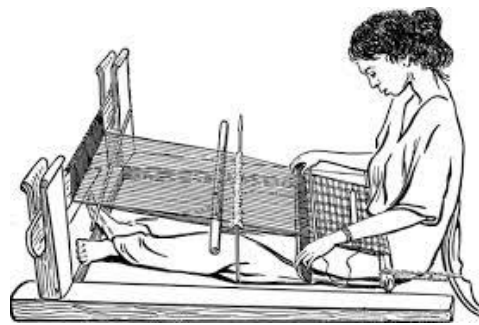
### Cotton from farm to factory

1. The cotton is picked. This must be done as soon as the ripe boll bursts open, before the seeds are scattered by the wind.
2. The seeds are removed in the gin houses.
3. The cotton is pressed into bales (about 125 kg per bale)
4. The cotton is taken to the ports. Today cotton is transported by truck, but in earlier days cotton was transported using wagons pulled by mules or oxen, or in the case of Egypt, on the back of camels.
5. The cotton is shipped to factories
6. In the factories the cotton is made into long fibres, put on to a spindle and woven into cloth with a loom.

Draw a labeled diagram of how cotton travels from the plantation to factories.



spindle



loom

## **Cotton 7**

### **Making cotton cloth**

1. When the cotton bale arrives at the mill it is a mass of kinky, tangled fibres, full of dirt and dried twigs and leaves. The bales are opened and the cotton put into a machine which blows the cotton apart, leaving the dirt behind.
2. The fibres are then pressed into a loose fluffy blanket. This blanket is carded and combed. Carding is a process of separating individual fibres, and placing so that they lie parallel to one another while also removing most of the remaining impurities. Combing gets rid of any fibres that are too short to use.
3. The fibres are twisted together and stretched. Then they are wound on to spindles.
4. The fibres are woven on looms.
5. The fabric is dyed.

#### **Put these in the right order:**

- Fibres are pressed into a fluffy loose blanket
- Fibres are untangled and dirt removed
- Fibres are woven together
- Fibres are carded and combed
- Fibres are dyed
- Fibres are woven on looms

## **Cotton 8**

### **Uses of cotton**

- Clothing
- Furnishing fabric, e.g. cushions
- Sheets and towels
- Belts for machinery, e.g. conveyer belts
- Tents, tarpaulins
- Bags and sacks of all description
- Aeroplane runways
- Motor car tyres
- Stuffing mattresses
- Oil from the seeds is used for cooking oil
- Oil is used for making candles and soap

Why do you think cotton is better for belts on machinery than leather?

#### **Make a poster**

List and draw all the uses for cotton in the home.

List and draw all the uses for cotton in industry.

# Vegetable growing

## Things to consider before you start

1. Can I sell it?
2. Can I grow it?

Before working out whether or not to grow a crop, you need to have a very firm idea of where the crop is going to be sold. There is no point in growing the finest looking and tasting crop if it sits in the garden because it can't be sold at the price needed to recover costs.

In addition to these key questions there are other considerations such as water and labour. Water for irrigation will be essential for vegetable production even in areas of high rainfall.

## Selecting the site

Site selection includes issues such as soil type and topography. Steep slopes are not suited to vegetable production and some soils will be unsuitable.

Your site may or may not come with water. The availability of water for irrigation is essential and vegetable production should not be contemplated without it.

## What should I grow?

Grow something you can sell.

Market demand should be a very significant influence on what you plant and how much. There is no point in getting a perfect crop if you have nowhere to sell it.

Climatic conditions are a major determinant of what can be grown and at what times of year.

## Production considerations

Labour may well be a determining factor in what you can grow or the amount that you grow.

Do you want to be able to manage on your own, or are you prepared to hire staff?

Is there labour available in your local area?

## Marketing your product

Selling direct to the consumer such as a roadside stall or farmers market has the lowest costs and lowest number of constraints. Another option is selling to restaurants and other food services.

## **Growing the crop**

### Fertilizers

Some fertilizer may need to be spread and applied pre-planting depending on the results of the soil test. Most crops will require some side-dressing after planting throughout their growing season. There is a range of fertilizers available, both chemical and organic.

### **Planting**

The choice of flat or raised beds depends on soil type, the crop, its production requirements, and the topography of your site. Typically, heavier soil types will require raised beds to ensure that there is good drainage around the roots of the crop. Crops such as lettuce which are very susceptible to water logging may require raised beds on lighter soils.

### **Pests and disease**

All vegetable crops will have some potential pest and disease problems. It is essential to monitor crops for pests and diseases as well as the incidence of beneficial insects.

Pest control that considers the whole biological system is called "Integrated Pest Management" or IPM.

### Chemical control

Some organisms have been shown to be resistant to certain chemicals or chemical groups. It is important to minimize the development of resistance. Chemical labels give information on how to minimize resistance. This may include rotating chemical groups or limiting the number of sprays per crop.

### **Irrigation**

#### Water supply

The availability of water for irrigation is essential for vegetable production and its supply and quality will determine the area and crops that can be grown. Supply must be reliable and typical water sources include rivers or streams, ground water, and farm dams.

### **Climate**

Climate and climatic variability are critical factors in vegetable production and is largely beyond your control, unless you plan to establish protected cropping such as glasshouse or shade-house production. Climate will determine what crops can be grown and at what time of the year. Some crops will be frost sensitive; others will have a heat requirement or a minimum soil temperature for germination of seed.

## **Weather**

It is also important to remember that weather conditions are variable and that there are also extreme events which can affect the growing conditions and crop quality.

Weather will also have an impact on disease and insect levels. Leaf wetness increases the likelihood of some fungal diseases and this is not only due to irrigation and rain but also humidity and dew. Other conditions which can influence pest and disease incidence include temperature and wind.

## **Harvesting**

Harvest labour can be a significant consideration when deciding to grow vegetables. You may need a consistent supply of labour or many hands all at once or something in between.

Will your crop be harvested by machinery or harvested by hand?

## **Project**

Imagine that you are going to start a vegetable garden.

Write a report on your garden. Include:

- How you will get started
- The site you will choose
- What you will grow and why you would choose these vegetables
- What you will need
- Some of the problems you might encounter
- How you will harvest your products
- Whether you will employ labour
- How you will sell your products.