

Teachers' Resource

2010



CARING
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COUNTRY



CANEGROWERS

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2010

Sugarcane Module:

Sugarcane farmers and their relationship with their natural environment

	Science Outcomes	Lesson Summary	Assessment Opportunities
Key Learnings	Students will be able to:	Students will be able to:	<ul style="list-style-type: none"> • class discussions
	<ul style="list-style-type: none"> • have a basic understanding of sugarcane farming in Australia 	<ul style="list-style-type: none"> • contribute to discussions about growing sugarcane 	
	<ul style="list-style-type: none"> • understand the relationship sugarcane farmers have with the environment 	<ul style="list-style-type: none"> • record their current understanding on what sugarcane farmers are doing to help protect soil and water 	<ul style="list-style-type: none"> • class activity sheets
	<ul style="list-style-type: none"> • have an understanding of where sugarcane is grown in Australia 	<ul style="list-style-type: none"> • have basic knowledge of sugar as a carbohydrate and why the body needs this type of energy 	<ul style="list-style-type: none"> • watch video on sugarcane
	<ul style="list-style-type: none"> • be able to appreciate the versatility of sugar, the products and the clean way it is manufactured. 		

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Classroom discussion notes: Sugarcane and its relationships

Growing sugarcane requires 4 elements: water, sunlight, soil and nutrients. Each element has a relationship with the sugarcane and determines how well it will grow. It is the sugarcane grower's job to also build a relationship with the sugarcane and its elements. How the grower achieves this comes with experience, knowledge and data. Each element has an environmental benefit of impact. Use these questions below as a basis for further classroom discussion. The CANEGROWERS competition question is highlighted in green. Conditions of entry and competition details are on the CANEGROWERS Educational Resource Book and also on the CANEGROWERS website on www.canegrowers.com.au

Relationships

Sun

How much sun is needed to grow sugarcane?
Does heat affect the sugarcane?

Water

How much water is needed to grow sugarcane?
What sources of water are used?
How many ways are there to water sugarcane?

Nutrients and soil

What are nutrients?
Why are nutrients important?
How does the grower get the nutrient recipe right?
What nutrients are kept in the soil?
How do growers feed the cane?
What happens when there are too much nutrients in the soil?
What happens when there are too few nutrients in the soil?
How does the growers stop soil erosion & water run off from the farm?
How does the grower ensure water run-off from the farm is not carrying soil or nutrients?

competition discussion question

How does the grower stop soil erosion and water running off the farm?

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Sugarcane farmers and their relationship with their natural environment

Use these Teachers' Notes to further engage classroom discussion and learning on the relationship between the environment and growing sugarcane.

Relationship Notes

Sugarcane:

Sugarcane is a giant tropical grass. It requires 4 elements to grow: water, soil, sunlight and nutrients.

Water:

How much water is needed to grow sugarcane?

Answer: Approximately 1500mm a year, but like most plants, the amount of water needed varies in each region depending on the soil, rainfall and sun. The amount of water needed is also determined by the size of the crop and the time of year.

What sources of water are used?

Answer: There are many sources of water that can be used. Rainwater falling naturally or collected in on-farm dams, water pumped from nearby rivers, allocated water from large dams which can also be recycled waste water from townships or sugar mills. This is a new technology being tried in a few places in Queensland and allows the re-use of our precious water to grow crops such as cane.

How many ways are there to water sugarcane?

Answer: Rain falling naturally is the most common way to water sugarcane. Sugarcane can also be watered using irrigating equipment. There are many types of irrigating equipment which include pumping and spraying water such as a giant garden sprinkler to overhead irrigators. This is a giant metal frame with water nozzles that can shower down onto the sugarcane or furrow irrigation using gravity to use water flowing down between crop rows.

Sunlight:

Sunlight is needed in order for the natural reaction (photosynthesis) to occur in the plant leaves, which makes the sugar that is stored in the sugarcane stalk. Without sunlight, no sugar can be naturally produced.

Does heat affect the sugarcane?

Answer: Yes, it can. Too much heat means higher water evaporation and the plant will require more water. Being a tropical plant, heat is required for germination and crop growth. If the plant gets too cold, it will slow down its growth and sugar production.

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Relationship Notes

Nutrients and Soil:

What are nutrients?

Answers: Nutrients are food for the plant and can be natural within the soil before man started farming or can be added by man as fertiliser or from fallow crops such as legumes which take nitrogen gas from the atmosphere and convert it and breaks down soil for use by sugarcane.

Why are they important?

Answer: They provide the soil health mixture which feeds the sugarcane and makes it a healthy crop. That makes growing sugar profitable, but it also returns the trash mulch to the ground to protect the soil.

How does the grower get the nutrient recipe right?

Answer: The sugarcane farmer tests the soil to find out what nutrients are lacking in that soil. The farmer would then ensure that the plant is provided with the nutrients that the soil lacks on that paddock.

What nutrients are kept in the soil?

Answer: There are 17 essential nutrients. Carbon, hydrogen and oxygen come from the atmosphere. 7 major nutrients are: nitrogen, phosphorus, potassium, calcium, magnesium, sulphur and silicon and 7 minor nutrients such as zinc, copper, iron, manganese, molybdenum, boron and chlorine.

How do farmers feed the cane?

Answer: Sugarcane farmers feed the cane through applying nutrients in the form of fertilizer, but first they must work out what each soil type can contribute and then they make up any shortfall with fertilizer. This can be complex because not all soil types are the same. The soil type can vary from paddock to paddock and also within each paddock. Nowadays, there is quite a lot of soil testing and soil mapping which occurs to ensure that farmers are only applying the exact nutrient needed on their different soil types.

What happens when there is too much nutrient?

Answer: This will be a waste of money and time to the sugarcane farmer. There is an increased chance of some nutrients moving off the farm and into the waterways.

What happens when there is too little nutrients?

Answer: When there is too little nutrients, it means that the cane will not grow as well and will not store much sugar in its stalk. It will usually not be a healthy looking crop and will have short skinny stalks with yellow leaves.

How does the growers stop soil erosion & water run off from the farm?

Answer: There are many ways to do this. One way is to use "trash blanketing." After harvesting the crop, left over leaves fall to the ground supplying a soft blanket of "trash" which is used as mulch to keep soil, water & nutrients in place.

How does the grower ensure water run-off from the farm is not carrying soil or nutrients?

Answer: There are many natural & man-made techniques to ensure that the water coming off the farms is not harming the rivers, creeks or GBR. Sediment traps, wetlands, dams, filtering through grasslands before it travels off the land.