

## Video Transcript

### Elementary Lesson 4: Plant Growth Affects the Soil

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Speaker 1: Do you ever think about what happens to the soil after you plant a flower or vegetable? How do plants continue to get taller and stronger? Think about it in human growth. How do you grow? That's right. You continue to grow because you continue to consume the nutrients your body needs to function. Just like when you drink a glass of milk. It brings in the calcium that your bones need. Just like that with plants. Plants need to continually be fed, and we feed our plants with fertilizer. Plants take the nutrients out of the soil, and fertilizer replaces those nutrients. Something else to think about is how different plants need different amounts of nutrients and sunlight to grow. Like my asparagus over there. It's referred to as a heavy feeder. It requires more nitrogen, phosphorus, and potassium than other vegetables like lettuce. Here I have some seed packets that I bought at our local garden center. The seed packets have instructions to help you plant the seeds correctly in your garden. I have corn, kale, and turnips. I'm just going to talk to you about corn right now.

Speaker 1: This is sweet corn. Sweet corn is one of my favorite vegetables in the summer. I love eating corn on the cob. Here on the back of the seed packet are instructions on how to plant the sweet corn. It tells me that the sweet corn is an annual, which means that it has to be replanted every single year. It tells me the planting depth. Once I prepare my soil bed, and I add the organic matter, and the fertilizer to it, I can dig a trench, and plant the sweet corn one half to one inch deep. Once the corn is up, and I can see the row, it tells me to thin, which means I need to pull out individual corn plants and thin the row to 12 inches, which means there should be 12 inches between every single corn plant. It also tells me that this sweet corn needs sun, not shade, six to eight hours of sunlight. The last one gives me the height. This sweet corn is going to grow eight foot tall, much taller than you are, I'm sure. It also tells me that I can direct sow it into the ground. Sowing means planting.

Speaker 1: When you sow your seeds into the ground, it means you are planting your seeds in the ground, and you must do that when the soil temperature is 60 degrees. You take soil temperature much like you take temperature for your own body. You use a thermometer, and you stick it down into the soil. You wait for it to rise, and it will tell you what the soil temperature is. It also says maturity. It takes 92 days from when you put the seed in the ground until it is ready to harvest. That's called maturity. Everything you need to grow sweet corn, the information that you need, is right here on the seed packet. Now we're going to harvest some garlic. I planted this garlic last fall. I followed label directions and applied fertilizer a couple of different times. The fertilizer with nitrogen phosphorus potassium helped the plant grow, so I don't know what's underneath the soil, so I'm kind of excited to dig down deep, and see what's growing underneath. Garlic is really good for your heart, so this is ...

Speaker 1: The garlic is something that I cook with a lot. We're just going to put this potato fork down in the ground, and I just want to loosen up the soil a little bit, so it's easier for me to pull. There we go. Okay. Here's the big reveal. Oh. Wow. Okay. You can see the roots, all these roots were pulling the nutrients up into this garlic head, and now as I remove the garlic head, I'm also removing the nutrients. Next time I plant in this spot in the garden, I'm going to have to put some organic matter in the soil, and make sure that it has the nutrients it needs to produce a different kind of plant. I know you can't smell

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this through the video, but this garlic smells awesome. What is a nutrient? A nutrient is substances that plants, and animals, and humans need to be healthy. Nutrients come from the soil, and help plants grow and produce food. The nutrients from this soil help these tomato plants produce tomatoes, that we put on our hamburgers, on our pizza sauce. We make it into ketchup.

Speaker 1: That food provides nutrients for people like me and you to grow up healthy and strong. Humans and plants need many of the same nutrients, including a variety of proteins, carbohydrates, minerals, and vitamins to stay healthy. Does anybody remember the three main nutrients plants need? That's right. Nitrogen, phosphorus, and potassium, N, P, and K. Nitrogen makes the plant strong. Phosphorus moves plant energy through the plant, and potassium helps the plant use water efficiency. That's a good review of nitrogen, phosphorus, and potassium. Do you know what nutrients human need? Some major ones I can think of include potassium, which helps your heart, iron, which helps move oxygen throughout our body, and calcium that gives us strong bones. Plants need nutrients just like you need vitamins, and if you're not getting the proper vitamins, your mom usually supplements with some kind of a vitamin. If the soil doesn't have the right nutrients, we supplement with a fertilizer.

Speaker 1: Today, we are video conference calling with Phil Furr. He's a farmer in Illinois, and today he's standing out in his cornfield, and going to share a lot of information about his farm with us.

Phil Furr: My name's Phil Furr. I'm a farmer, and I'm in Taylor Ridge, Illinois.

Speaker 1: Phil, can you tell us what you grow on your farm?

Phil Furr: We grow corn and soy beans.

Speaker 1: What are some of the items that kids like to eat that may have come from your farm?

Phil Furr: You can find a lot of ingredients in a lot of food that comes from soybeans, and corn. Soybean oil, soybean meal. There's a lot of corn sweeteners used in a lot of things today, so there's a lot of products made from corn and soybeans that if you look in your ingredients in a lot of your foods, you'll see that.

Speaker 1: What effects do plants have on soil? In other words, how is the soil different after the crops have been harvested?

Phil Furr: When we grow our crops, the plants, the corn and soybeans, remove nutrients from the soil. The plant needs these nutrients to grow, and to enable us to harvest a crop from the soil, so after we remove the crop, the soil will actually be somewhat deficient in nutrients, because the plant removes a lot of nutrients from the soil. What we do is, is replenish the soil with those nutrients, and we use three primary fertilizers, nitrogen, phosphorus, and potassium. Those are the primary nutrients that are required by some of our plants and some of our crops to raise a good crop.

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- Speaker 1: In order to keep your farm more sustainable, what do you do with the soil before you plant a new crop?
- Phil Fuhr: Usually after harvest in the fall or the winter months, we'll test the soil, and what we do is, is we pull samples of soil in various patterns of the field, and we'll send that soil sample into a laboratory, and they'll analyze it, and tell us what levels of nutrients are still available there. From this, we can make our applications of fertilizer according to this test. Usually, we have to apply several hundred pounds of phosphorus and potassium fertilizer, and as well as nitrogen fertilizer for our corn crop.
- Speaker 1: When fertilizer goes into the field, how does it stay there?
- Phil Fuhr: When we spread those fertilizers onto the soil, it typically, with some moisture, it breaks down into the soil, and it adheres to the soil. It actually is tied up into that soil, and then it's the plant's job during the growing season to absorb those nutrients, and pull them up out of the soil. It does that through its root system.
- Speaker 1: If you could give your students one tip for growing a garden, what would it be?
- Phil Fuhr: I think one of the best tips I could give someone in their garden is to try to eliminate all the weeds in their garden, because these weeds compete with the plants that they're growing, and these weeds will steal nutrients from the soil. Those nutrients won't be available for their garden plants, so if they could keep their garden very clean, and remove all the weeds, it will definitely be beneficial for their plants.
- Speaker 1: Thank you, Farmer Phil, for joining us today via video conferencing. It was really neat to see a farmer working out in his field, and learning more about what you do to put food on our table.