Soil Amendment Products - Teacher

What is a soil amendment? What does a soil amendment do?

Background

There are many new products for farmers to add to the soil to enhance nutrient availability to their seeds in the hopes of getting a better crop. If there is increased yield (more seeds harvested) then there is more money returned to the farmer. If the amount of money from the sale of the crop is not equal to or greater than the amount invested, then the farmer loses money.

Soil tests and tissue tests are performed on fields and crops to determine if nutrients are being absorbed and utilized by the plant.

In this case study, you will be investigating two different products that were used on test plots of soybeans. Your job is to analyze the data collected to determine if these products make a difference and what specific data you will need to make a decision.

Materials
BioBuild BioComplete product page
Fertizol Zn product page

Procedure

1. Investigate the three most common nutrients found in fertilizer: nitrogen, phosphorus and potassium. Use these links as a resource:
   https://www.greenwaybiotech.com/blogs/gardening-articles/whats-the-function-of-nitrogen-n-in-plants
   https://www.greenwaybiotech.com/blogs/gardening-articles/whats-the-function-of-phosphorus-p-in-plants
   https://www.greenwaybiotech.com/blogs/gardening-articles/whats-the-function-of-potassium-k-in-plants

2. For this case study, Zinc is a critical soil mineral. Investigate which other soil minerals/ nutrients may impact the uptake of Zinc. This link will give a good overview:
   https://plantprobs.net/plant/nutrientImbalances/zinc.html

3. Study the product pages for BioBuild and Fertizol. Answer the questions below.

   a. What does each product do?
   BioBuild BioComplete

   Fertizol Zn

Boosting the Chemistry of Soil

3. What data will help you to tell if the products above make a difference?
   BioBuild BioComplete

- phosphate levels in soil and tissue
- nitrogen levels in soil and tissue

Fertizol Zn

The amount of zinc and its availability in soil can be affected by:

- pH - increased pH decreases zinc availability
- Phosphorus - high levels of phosphorus decrease zinc availability
- Nitrogen - low levels of nitrogen can reduce a plant's ability to uptake zinc
- Moisture - excessively wet soil reduces the ability of plants to uptake zinc
- Copper - zinc and copper appear to be taken up by plants via the same mechanism so when one is in excess, plants don't absorb enough of the other – notice that in the data set provided, Cu is tested in tissue, but not in soil
- Magnesium - magnesium may assist with the uptake of zinc

4. Create a list of questions to which you would like to find answers. How might you use the data collected on soil tests and soil tissue to help you to find the answers?

Some examples may include:

- *What are the P and N values in tissue samples across the BioBuild trials?*
- *What are the amounts of N and P in soil compared to the amounts of N and P found in tissue samples in BioBuild trials?*
- *What differences are seen between amounts of BioBuild used in different trials?*
- *What is the pH and P content of soil in high Zn (and Cu) amounts in tissue samples?*
- *What is the N level in soil in low Zn (and Cu) amounts in tissue samples?*
- *Is there a difference in yield in areas with higher Zn content?*