COFFEE GROUNDS FOR NITROGEN

Cornell Cooperative Extension SOIL3 Project

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SIGNS OF NITROGEN DEFICIENCY

In the United States alone, we drink an average of more than nine pounds (4.2 kilograms) of coffee per person every year (WorldAtlas). All of those spent coffee grounds are a good source of nitrogen for your soil. Whether you are a gardener or a small-scale farmer, using spent coffee grounds as a fertilizer is both creative and sustainable.

Before applying coffee grounds, check that your soil needs nitrogen by looking for signs of nitrogen deficiency in your plants, or test your soil. Some of these signs include:

- Stunted or slowed plant growth.
- Pale or yellowish-green colored leaves. As a mobile nutrient, nitrogen will move from one area of the plant to another as needed. As a result, the yellowing will occur in the lower and older leaves first.
- Older leaves decaying early.

HOW MUCH NITROGEN WILL I GET?

Composting spent coffee grounds before using them as a fertilizer will allow for a faster release of nitrogen to the soil, resulting in a quicker response from the plant. After composting, the spent coffee grounds will have about 2% available nitrogen. While this is less than the content of most commercially available nitrogen fertilizers, the nitrogen from composted coffee grounds is less likely to be lost through leaching and runoff, ensuring delivery to your plants.

Fresh coffee grounds (unused and right out of the packaging) can dramatically lower soil pH and are not recommended for use as a fertilizer. A sudden decrease in pH can inhibit plant growth, harm beneficial micro-organisms in the soil, and keep the plant from taking up nutrients.

HOW TO USE COFFEE GROUNDS FOR NITROGEN

There are three easy and effective ways to use coffee grounds to get nitrogen to your plants: 1) compost the spent grounds, 2) make a compost tea from the spent grounds, or 3) spread the spent grounds directly on the soil surface.

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Compost

Coffee grounds are an ideal "green" or nitrogen-rich material for composting. Use a large bucket or bin to mix your spent coffee grounds with carbon-rich or "brown" materials such as leaves or wood chips. The mixing ratio should be 1:1 to 4:1 browns to greens (ranging from equal amounts of browns and greens, to four times as many browns). Check the compost each week, water as necessary to maintain moisture, and mix. Make sure to keep the bin covered. When complete the compost will have an earthy look and smell. You can then incorporate the finished mixture into the soil as needed.

Spread it

Instead of composting, you can take your spent grounds straight out of the coffee pot and spread them over the cultivation space. Make sure to work the grounds into the soil with your hands or a garden tool. Because you are not composting the spent grounds, nitrogen delivery will be slower but it will still be effective over time.

Compost Tea

To make a compost "tea" (or in this case a coffee grounds "tea"), use a mesh-like fabric square as a tea bag. Place your spent coffee grounds in the center of the fabric, then pull up the sides and tie off, being careful to not let the coffee grounds spill out. Once secure, put your tea bag into water and let it steep for a few hours or overnight. Use approximately 2 cups of spent coffee grounds per 5 gallon bucket of water. You can use this concoction as a liquid fertilizer for your garden and container plants.

HOW MUCH DO YOU NEED TO MEET YOUR PLANT'S NEEDS?

Vegetable and field crops require approximately 1.5 to 6.4 ounces of nitrogen per 100 square feet. As coffee grounds are only 2% nitrogen, you would require 4.6 to 20 pounds of used coffee grounds per 100 square feet to meet the needs of your crop. This number does not account for slow nutrient release or inevitable nitrogen losses with leaching, which means you would likely need even more used coffee grounds.

The average American produces 9 pounds of used coffee grounds per year, so those with larger gardens may not make enough grounds to meet the needs of their crops. Additionally, plants need a variety of nutrients in addition to nitrogen that the coffee grounds won't provide. It is therefore best to use coffee grounds as a nitrogen amendment along with other fertilizers.

One further consideration is that some research has shown stunted growth and reduced germination rates in soils with high (25%) levels of coffee grounds. When you use your spent coffee grounds, never add more than a few ounces per square foot.

ADDITIONAL RESOURCES:

For further information or if you have any questions, contact your local Cornell Cooperative Extension office, visit the SOIL3 website at https://blogs.cornell.edu/soil3/ or email soil3@cornell.edu.