The Garden as a Lab

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Solve your garden problems by using scientific methods

Most gardeners possess a natural curiosity about plants. We often ask questions and attempt to solve problems that arise in the garden. Which tomato variety will ripen the earliest in my garden? Which snap bean varieties will yield the largest harvest? Should I use fertilizer X or fertilizer Y on sweet corn? Which product or method will work best to control aphids on roses? Which raspberry varieties are resistant to wilt?

Often, problems and questions can be addressed with a little experimentation. We try different varieties, methods and products, then observe what happens. However, the results we get may not be reliable or valid, if the experiments have not been designed and carried out properly.

If you want to find your way to a trustworthy diagnosis and treatment plan using experimentation, here are a few tips for you to consider:

1. Repeat the experiment several times to see if you get the same results. Achieving the same or similar results during several repetitions helps to determine the validity of the experiment.
2. “Randomize” the experiment. In each repetition, change the sequence of the treatments. Randomizing helps to eliminate bias. For example, if you’re using different pesticides to treat several rows of potatoes for, say, Colorado potato beetle, when you apply the treatments the second, third and fourth times, change the order of the rows of plants in which you are applying the different treatments.
3. Include a control group in your experiment. This is a group of plants that is left untreated, so you can compare the results of each of the experiential treatments to what happens when you apply no treatment at all.
4. Keep all other elements of the experiment the same, to eliminate variability in the results. For example, in an experiment comparing the effectiveness of two fertilizers, all of the plants should receive the same levels or conditions of temperature, soil, water, light, etc.
5. Use a row of buffer plants between each row or plot that receives a different treatment. Buffer rows help to isolate one treatment area from the effects of another treatment taking place in the same field. For example, a buffer row will help to prevent a spray application from drifting into the next experiential row and contaminating it.
6. Request assistance from an expert. Write down how you plan to perform the experiment, then ask a professional scientist or researcher to read it and discuss it with you. The expert can tell you if you’re on the right track, or if you’ve failed to consider something important that will affect your results. An expert also can advise you on methods for taking samples and evaluating data.
7. Keep good records. Take detailed notes during every phase of the experiment, including the dates and times when you made observations or performed actions. Another person

should be able to read what you've written, repeat the experiment, and get the same results.

8. If you use pesticides or herbicides in an experiment, read the product labels completely, and carefully follow all directions and precautions for mixing and applying them. Use herbicides and pesticides only on plants, animals or sites that are listed on the label. It is against the law to disregard label directions. Always store herbicides and pesticides in their original containers, and keep them out of the reach of children, pets and livestock.

By following these tips, you can determine the best course of action when troubleshooting problems in your garden — and be confident that your decision is accurate and the best solution for your site.

Experiment when planting your garden this spring to see which products and locations work best. But keep good records of the results.
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