

# What is Research-based Information?

Scientific literature is information that has been *peer-reviewed* and is often geared to an academic audience. Extension publications are also peer-reviewed but target a more general audience. When an article appears in a peer-reviewed publication, it means the methods, results, and conclusions were found to be scientifically valid by objective outside experts.

Other information sources include *gray* and popular literature, neither of which are peer-reviewed and primarily focus on professional and general audiences, respectively. These resources can be valuable but the objectivity and credibility of the information should be assessed.

Questions to assess scientific objectivity and credibility of gray or popular literature:

- Does the author have legitimate ties to a mainstream academic or scientific institution?
- Does the article refrain from attempts to sell a product?
- Does the article present verifiable information?
- Does the article appeal to reason rather than emotion?

If the answers to the above questions are “yes,” then the likelihood is high that the information is objective and credible.

- Master Gardeners are volunteer educators who rely on science-based information. MGs cannot recommend a practice or product that lacks legitimate scientific basis.
- Furthermore, it is illegal to sell unregistered substances for use as pesticides.

## What is needed for a Scientific Experiment?

(For instance, testing the effects of a chemical for disease control.)

1. **Controls:** For every plant that is treated, another should not be treated or be treated with a placebo such as water only.
2. **Replicates:** To obtain statistically valid data, each treatment needs to be replicated. In controlled environments such as laboratories, there can be as few as three replicates. For more variable environments, such as greenhouses, there may be ten replicates. In a field situation – the real world – 20 replicates is common.
3. **Repetition:** To verify results from the first trial, the experiment should be repeated. In general, three repetitions are considered the minimum

(Adapted from “Compost Tea: Examining the science behind the claims,” Horticultural Myths, Winter 2007, , [http://www.puyallup.wsu.edu/~linda%20chalker-scott/horticultural%20myths\\_files/Myths/magazine%20pdfs/CompostTea.pdf](http://www.puyallup.wsu.edu/~linda%20chalker-scott/horticultural%20myths_files/Myths/magazine%20pdfs/CompostTea.pdf) , Dr. Linda Chalker-Scott, PhD, Associate Professor and Extension Urban Horticulturist, WSU Puyallup Research and Extension Center.)

## Several Useful Definitions

<http://www.nlm.nih.gov/nichsr/hta101/ta101014.html>

**“Gray literature:** research reports that are not found in traditional peer-reviewed publications, for example: government agency monographs, symposium proceedings, and unpublished company reports.”

**“Peer review:** the process by which manuscripts submitted to health, biomedical, and other scientifically oriented journals and other publications are evaluated by experts in appropriate fields (usually anonymous to the authors) to determine if the manuscripts are of adequate quality for publication.”