

## Research Piece

### Compost Activators, Myth or Reality?

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Can those magical starter concoctions, as advertised in nearly every organic gardening catalog, really jump-start your compost pile? Maybe so, but probably not. Called by various names—activators, inoculums [more properly “inocula”], inoculants [technically, “inocula” is the stuff used to “inoculate”], and bacterial boosters, these arcane powders for stimulating homemade compost have been around since before the “original” environmental fad of the 1970s. Yet, to this day, little more than personal testimony is available to backup the maker’s claims. Are compost inocula making dubious assertions about their effectiveness, like those miracle septic tank elixirs and wonder vitamins for people? For now, most likely.

Compost inocula are made of many types of microscopic life—fungi spores, and aerobic and anaerobic bacteria—with names that read like Egyptian hieroglyphics. The concept behind inocula is that your compost materials either don’t have enough total numbers of beneficial decomposers, or not the broadest or best strains of bacteria and microbes. In reality, these decomposing critters may never be needed.

Research on composting at the University of California at Berkeley in the 1970s studied the effectiveness of horse manure, “rich” soils, composting material, and two commercial preparations as inocula. These studies by Dr. Clarence Golueke and his associates found that, as Golueke wrote in 1972 in *Composting, A Study of the Process and its Principles*, “The composting process was neither accelerated nor the final product improved by the inoculums, even though the inoculums were rich in bacteria.” And, little has changed since. Golueke still maintains that inocula are not required because “(all) refuse carries the seeds of its own destruction.”

Noted organic horticulturist Richard Merrill [30 years teaching organic gardening and farming at Cabrillo College in Aptos, California] writes: “The experiments I did in the 70s confirm that the best activator is very old [1–2 years] compost. What you really need is not fancy bacteria, but a good population of lignin and cellulose decomposers [fungus and actinomycetes], not usually found in commercial activators, but common in old compost.”

In a study conducted by the University of Vermont Extension, Vern Grubinger found: “All of the microbes required for a healthy compost process are already present in most wastes that can be composted, and therefore the utility of adding compost inoculant is limited. A notable exception can be food wastes, which are often cooked (i.e., sterilized). In a study that examined the effect of inoculants, added microbes could not subsequently be found in dairy manure compost, apparently because the existing microbes excluded introduced organisms.”

More recently [in 2000], Jim McNelly established, “The existing beneficial micro-organisms in the raw material or the added culture inoculated from an active composting pile will provide all the essential micro-organisms sufficient to initiate active composting. Saving old compost to ‘re-seed’ the

next batch is a sure and inexpensive means of maintaining the active compost culture without having to purchase inoculants time and time again.”

## Composting Science

The difficulty with manufacturers’ claims is that no one seems to have done a scientific and replicated [repeated compost piles with a control pile and other piles with different inoculants] third-party study since 1972—and even then it had no control pile. Many organic gardening methods and techniques can be backed up with university-based studies, but adding compost activators doesn’t seem to be one of them. The only inoculation “data” any company can currently point to is either subjective observation [“The pile seemed to heat up faster.”] or limited trials done by the manufacturers.

As long ago as 1991, a brochure for the company selling Ringer’s inocula alluded to “University tests” that showed the temperature in the pile peaked some 15° to 20° F higher than the control pile for a day or two. At that time, I called and spoke to or left messages for Rob Ringer four times over a three-year period with regards to getting a copy of the research, but I never received a copy. “I haven’t seen it. I’ll have to talk to the R&D department to see if we can find it,” was Ringer’s response during one conversation. Furthermore, the very same brochure copy claims, “Ringer’s compost inoculum increases pile temperatures after 6 days to speed composting.” Yes, the chart shows the inoculated pile temperature very much higher than the control after day seven—from 20° to 60° F higher. By general scientific agreement, a compost pile isn’t “finished” or ready to use until the internal temperature drops into the mesophilic [middle temperature] range, or below about 110° F, which isn’t even visible for the inoculated pile on the Ringer chart. In this case, their own chart shows the composting process with inocula takes longer, not quicker.

To this day, some 16 years later, I have talked to manufacturers, university researchers, professional compost program coordinators, and compost operators, and nobody—not even those who use inocula—can point to an existing replicated university study of compost inocula for home composting. Even an email on 9-25-07 from one of the largest and oldest [25 years in business] states: “I am not aware of any research that shows that inoculating your compost pile with whatever, makes it compost faster. I think it has more to do with what you are using to compost and how small the pieces of whatever are [i.e. chipped and shredded rather than whole pieces of whatever].”

However, they continue to sell an inocula!

One marketing approach at the time was to compare the count of viable aerobic bacteria of various products. Necessary Trading Company [who went out of business after this limited research] had Virginia Polytechnic Institute and State University analyze their BioActivator<sup>®</sup> for spores per gram. The results for products “on-the-shelf” from two to fifty-eight months ranged from 83,000,000 to 3,500,000,000, with an average of 1.96 billion viable spores. They guaranteed one billion spores per gram for thirty months after purchase. They compared their product to tests on Ringer’s product [740,000 spores per gram] and a product from Sudbury [less than 30,000 spores per gram]. This led to the claim that the BioActivator<sup>®</sup> will “speed the process [of composting] along”, and that “University tests show Compost BioActivator<sup>®</sup> over 1000 times more powerful”. Two pages away, the claim drops to: “Independent tests show Compost BioActivator<sup>R</sup> to be 10–100 times more

powerful than any competitors”. While there is a certain logic to saying the number of spores equals “power”, there are no studies to correlate these two potentially divergent or compatible elements. What if all you needed were 100,000 good critters to jump-start your compost? The rest would be a waste. According to Will Bakx from Sonoma Compost [Petaluma, California], the inoculant bacteria are actually hard to introduce because “of the competitiveness of the native bacteria, and it’s hard to test for the survival of introduced bacteria.”

In 1992, Necessary Trading Company backed up their claims with a single test of one pile each of a control, a Ringer-inoculated pile and a Compost BioActivator<sup>®</sup>-inoculated pile, followed through a single cycle. Their product did heat the pile 15° F above the control some eight days earlier. But, the drop to the mesophilic temperatures happened only twelve or so hours earlier with the Compost BioActivator<sup>®</sup> pile.

Can inocula hurt your compost pile? No. In fact, most inocula don’t cost that much—usually \$2 to \$15, sometimes more. However, you’re just throwing money around unnecessarily.

So, save some money by saving some old compost.