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## FAQs of Sprayer Calibration for Tainio Biologicals, Inc. Products

### **Q: How sprayable are Tainio products?**

A: The short answer is, different products have different degrees of sprayability.

### **Q: Why are different Tainio products more or less sprayable than others?**

A: The answer is primarily based upon the composition of the product.

- The foliar products (Micro 5000, etc.) are made almost entirely of soluble materials and will dissolve into water and pose little risk to spray equipment plugging.
- The liquid enzyme products (Pepzyme series) are also made of soluble materials and have already been dissolved into water.
- The soil amendments/soil applied products are made mostly of fine, suspendable materials.

### **Q: What is the difference between soluble and suspendable materials?**

A: In general, a soluble product will dissolve into a liquid (like salt into water). A suspendable product generally will not dissolve into a liquid; instead, it will mix into the liquid and remain there until it settles out.

### **Q: What should I expect from the suspendable materials?**

A: Given good mixing and agitation, the material will remain in the water column. If allowed to rest, the material will settle to the bottom and needs to be re-suspended. In a bottom feed tank, if the material is allowed to settle, plugging can occur.

### **Q: How can I avoid plugging?**

A. 1. Know the material that you are using; is it soluble or suspendable?

- If soluble, perform jar/mix test and proceed
- If suspendable, use at least a 50 mesh screen and agitation

A. 2. Always perform a mix test or jar test

- Take the various materials that you plan to apply and mix, to scale, in the same order they will go into the tank, and allow the mixture to rest.
- If large chunks or particles form, a precipitation reaction may be occurring, which could indicate that the materials are not compatible, or the order of mixture was wrong.

### **Q: Why does screen size or mesh matter?**

A. Like the seeds of different crops, different types of microorganisms grow to different sizes. They can also create elaborate and complex communities or structures as they grow.



We can use seeds, which come in many different sizes as an example. A machine that is calibrated for spreading grass seed will not be effective in spreading bean seed, and will plug the system.

**Q: What does mesh size mean?**

A: In the U.S., to determine mesh size, count the number of openings in one inch of screen. The number of openings is the mesh size. So a 4-mesh screen means there are four little squares across one linear inch of screen. A 100-mesh screen has 100 openings, and so on. As the number describing the mesh size increases, the size of the particles decreases. Higher numbers equal finer material. Mesh size is not a precise measurement of particle size.

| Sieve Mesh # | Inches | Microns | Typical Material |
|--------------|--------|---------|------------------|
| 14           | .0555  | 1400    | -                |
| 28           | .028   | 700     | Beach Sand       |
| 60           | .0098  | 250     | Fine Sand        |
| 100          | .0059  | 150     | -                |
| 200          | .0029  | 74      | Portland Cement  |
| 325          | .0017  | 44      | Silt             |
| 400          | .0015  | 37      | Plant Pollen     |
| (1200)       | .0005  | 12      | Red Blood Cell   |
| (2400)       | .0002  | 6       | -                |
| (4800)       | .0001  | 2       | Cigarette Smoke  |

<http://www.showmegold.org/news/Mesh.htm>

With the wide variety of shapes, sizes, clusters, and groupings we find in the microbial world, special care must be taken in both the formulation and the application of microbial products. If product is ground too small, some of the spores or clusters will be damaged. If a sprayer's screen mesh is too small, microbe spores or clusters can be damaged or sieved out, resulting in a lower population density. If screen mesh or particle size of product is too large, there is an increased risk of plugging of spray equipment.

In order to maximize product quality (too small = loss of population density / too large = higher chance of plugging) We reduce the particle size of most of our suspendable microbial products to work with spray systems that have **50 mesh** screens.

Checking product compatibility (jar test), ensuring good agitation, and matching sprayers and screens to product type (50 mesh screen) will help ensure maximum product productivity (population density), even coverage, and ease of use.

