

WHY CONDUCT BENCH TRIALS?

We recommend performing bench trials with many of our products including lysozyme, tannins, enzymes, and fining agents. A bench trial is a small-scale test that simulates the effect the product will have on a large volume of wine. Bench trials are used to evaluate the efficacy of treatments, determine proper dose rate, and gain familiarity with addition methods. By working in small volumes, large volume mistakes can be avoided.

Wine matrices differ for many reasons (vintage variations, winemaking practices, etc.), so bench trials must be repeated for every lot of wine. An additive that worked last year or in a different lot may not work again in the same way or at the same dose. Bench trials also demonstrate how an additive will behave during preparation (rehydration) or mixing. Many fining products have unique and sometimes difficult solubility issues which can pose a challenge in the cellar. Bench trials alert the winemaker to potential issues and can help formulate a more efficient plan when additions are made in the cellar.

PROTOCOL:

Step 1: Decide which dosages to prepare for the trial (for example: Control, 100 ppm, 200 ppm and 300 ppm). Consult product technical information for manufacturer’s recommended dosages. Ensure a control (untreated sample) is included.

Step 2: Prepare stock solution:

- a. Choose the concentration of stock solution to prepare in % (w/v) for powdered products or % (v/v) for liquid products
- b. Choose volume of stock solution to prepare (in mL)
- c. Calculate how much product is necessary to prepare the stock solution by using the worksheet on pg 91.
PRO TIP: A 2.5%, 5% or 10% stock solution can be prepared by adding 2.5, 5.0, or 10.0 grams of product to total volume of 100 mL, respectively. Liquid products can also be prepared in this way by adding 2.5, 5.0, or 10 mL product to clean water for a total volume of 100 mL.
- d. Measure the product. Mix it with a portion of the water needed for the stock solution in a volumetric flask (or graduated cylinder). Allow it to dissolve/mix in. Then, add the rest of the volume of water to bring the solution to the correct volume.
- e. Agitate gently to mix.

Step 3: Prepare trial:

- a. Determine how much stock solution should be added to each of the trial dosages using either the worksheet on pg 91 or the “cheat sheet” to the right.
- b. Add the appropriate volume of stock solution to the trial bottles, then fill to the proper level with wine (evacuating the head space with gas, if possible).
- c. Agitate gently to mix.

Step 4: Taste and/or test after the appropriate waiting period. Consult product tech sheet for recommended contact time.

PRO TIP: For fining agents, this might just be as long as it takes the agent to settle. For tannins, it should be at least several days, but it is even better if the trial can sit for at least one week. For THERMIC, it should be at least 10 days.

| Cheat Sheet: | | | |
|----------------|----------------|---|--------------------------------------|
| Desired Dosage | Stock Solution | mLs of solution to add to 375 mL bottle | mLs solution to add to 750 mL bottle |
| 100 ppm | 2.5% | 1.5 | 3.0 |
| | 5.0% | 0.75 | 1.5 |
| | 10.0% | 0.375 | 0.75 |
| 200 ppm | 2.5% | 3.0 | 6.0 |
| | 5.0% | 1.5 | 3.0 |
| | 10.0% | 0.75 | 1.5 |
| 300 ppm | 2.5% | 4.5 | 9.0 |
| | 5.0% | 2.25 | 4.5 |
| | 10.0% | 1.125 | 2.25 |
| 400 ppm | 2.5% | 6.0 | 12.0 |
| | 5.0% | 3.0 | 6.0 |
| | 10.0% | 1.5 | 3.0 |
| 500 ppm | 2.5% | 7.5 | 15.0 |
| | 5.0% | 3.75 | 7.5 |
| | 10.0% | 1.875 | 3.75 |

BENCH TRIAL PROTOCOL WORKSHEET

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| <p>Step 2 (c) Calculate how much product is necessary to prepare the stock solution</p> | FOR POWDERED PRODUCTS (Lysozyme, Tannins, Fining Agents, etc.) |
| | $\left(\frac{\text{desired concentration of stock solution } (\%w/v)}{100} \times \frac{\text{desired volume of stock solution (mL)}}{\text{desired volume of stock solution}} \right) = \text{weight of product to add to stock solution (g)}$ |
| | FOR LIQUID PRODUCTS (Liquid enzymes, Gelatins, etc.) |
| | $\left(\frac{\text{desired concentration of stock solution } (\%v/v)}{100} \times \frac{\text{desired volume of stock solution (mL)}}{\text{desired volume of stock solution}} \right) = \text{volume of product to add to stock solution (mL)}$ |

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|---|---|
| <p>Step 3 (a) Determine how much stock solution should be added to each of the trial dosages. This calculation must be repeated for each trial dosage.</p> | FOR POWDERED PRODUCTS (Lysozyme, Tannins, Fining Agents, etc.) |
| | $\left(\frac{\text{trial bottle size (mL)}}{\text{trial bottle size}} \times \frac{\text{desired concentration (ppm)}}{\text{desired concentration (ppm)}} \times 0.0001 \right) = \text{stock solution to add to trial bottle}$ |
| | $\frac{\text{concentration of stock solution } (\%w/v)}{\text{concentration of stock solution } (\%w/v)}$ |
| | FOR LIQUID PRODUCTS (Liquid enzymes, Gelatins, etc.) |
| $\left(\frac{\text{trial bottle size (mL)}}{\text{trial bottle size}} \times \frac{\text{desired concentration (mL/1000 gal)}}{\text{desired concentration (mL/1000 gal)}} \times 0.000024 \right) = \text{stock solution to add to trial bottle}$ | |
| $\frac{\text{concentration of stock solution } (\%v/v)}{\text{concentration of stock solution } (\%v/v)}$ | |