

Guidelines for collecting water samples from wadeable streams for copper testing



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Background

Scion is undertaking a project for the Forest Owners Association (FOA) to assess concentrations of copper in waterways, following aerial application for *Dothistroma* control. As part of the project, Scion has been asked to provide some guidelines to the forest industry on taking water samples from streams for copper analysis, so that they can undertake their own monitoring.

Guidelines for collecting water samples from wadeable streams for copper testing

- Undertake a desktop exercise to locate suitable sites for water sampling
- Undertake a field visit to assess accessibility to the stream site/s. Select the sampling points (usually at the downstream end of the area being sprayed) and GPS their locations.
- Locate a laboratory that can undertake copper testing of water samples. It is preferable to use a laboratory that provides you with the bottles and a chain-of-custody sheet.
- Determine with the laboratory the correct type of bottle (i.e. plastic, clear glass, coloured glass) & size of bottles to use, whether to rinse the bottles before use (some bottles may have been treated to assist in preserving the sample), whether to leave air space at the top of the bottle, whether the samples should be chilled, holding times etc. If the bottles contain any preservatives (usually nitric acid for metals such as copper) confirm handling procedures and any PPE requirements. Check the field sampling procedure (a generic sampling procedure is outlined below) with the laboratory to ensure that it is acceptable. Check that the detection limit that the laboratory can test to, is suitable for the standards that you are testing against.
- Determine your sampling strategy, i.e. where and when you will sample, number of samples etc. It is preferable to take water samples prior to spraying to determine any background concentrations of copper that may be in the waterway being monitored. On the day of sampling, take the first sample after spraying as soon as it is safe and practical to do so. If possible, take additional samples during the first few hours after spraying. Stream size, length and flow will all influence the speed at which any copper in the waterway will move through the system.
- Use the sampling plan to calculate the number of bottles required. Order the bottles well before spraying starts. Store the bottles in a secure location so they are not accidentally contaminated or used for other purposes. Take extra bottles into the field as back-up.
- At the site, fill out the label/tag on the water bottle, also record this information in a notebook so that you have a back-up if the label/tag is damaged.
- Take the water sample upstream from where you enter the waterway, facing in an upstream direction so that you are sampling undisturbed water. Take the sample from the main part of the flow. Keep your fingers away from the mouth of the bottle and the inside of the lid to avoid contamination. Place the bottle open end downward into the water column and scoop upward in an upstream direction. Ensure the lid is screwed on securely. Take care not to disturb the stream bottom. Avoid sampling ponded/stagnant water or backwater areas. Check this sampling strategy is in-line with laboratory requirements and amend if necessary.
- Place the sample in a suitable storage container to prevent contamination of the sample. Chilli-bins are often used for this purpose. Include freezer pads in the storage container if the sample requires chilling.
- Back at the office, fill out the chain-of-custody sheet, and keep a copy for your own records. Put the chain-of-custody sheet in with the samples and courier/drop-off to the laboratory.
- If retaining samples overnight, keep them in a secure (preferably lockable) place to maintain the integrity of the sampling process and, if required, under chilled conditions.
- Return any unused bottles to the laboratory.