

## **Internal Check System**

To insure reliability of laboratory results, an internal check system is essential. This is in addition to any external sample exchange between laboratories.

The first sample in every tray should be a standard sample of known composition. This standard should be prepared by drying, grinding, and homogenizing a 25 to 50 lb sample. Homogenize the ground sample thoroughly and store the bulk sample in a heavy plastic bag inside a 5-gal closed container away from lab fumes.

After this standard soil has been analyzed 50 times, calculate the mean and standard deviation for each analysis. On graph paper, prepare a chart with the mean and  $\pm$  one standard deviation on the vertical axis and date of analysis on the horizontal axis. The graph over time should be a sequence of points forming a near-horizontal line within the one standard deviation, above and below the mean from the 50 analyses. Post this chart (a separate chart for each element) next to the instrument used to measure that element. The analyst records the value of the standard sample on the chart at the start of the tray and can see at a glance if the analysis is within tolerable limits. If not, the problem should be resolved before proceeding.

The mean and standard deviation of the standard sample should be recalculated after every 50 trays to determine whether the instruments are drifting or the sample itself is changing. Scrupulous adherence to this internal check program will help insure reliable data.

For matching colorimeter tubes dilute 1 mL of 3 N  $\text{Na}_2\text{Cr}_2\text{O}_7$  in 10 N  $\text{H}_2\text{SO}_4$  to 1 L and mix thoroughly. Place this solution into the colorimeter tubes to be matched and read.