

SEA NO.21 DEC.1998

Mapping with Bench-Top Micro X-ray Fluorescence Analyzer

1. Overview

The SEA5100 series instrument is able to accurately align its optical position and X-ray micro beam, and analyze elements at microscopic levels. It is also capable of line and surface measurements (mapping measurements) when used in analytical applications (qualitative, bulk FP, thin film FP).

2. Mapping Example 1 (withered part of foliage plant)

For this application we mapped a foliage plant. Photo 1 is a 2X magnified image taken with a digital camera. Photo 2 is a 33X image taken by the SEA5120 CCD camera. The area enclosed by the rectangle in Photo 2 is the area mapped (withered area).



Photo 1

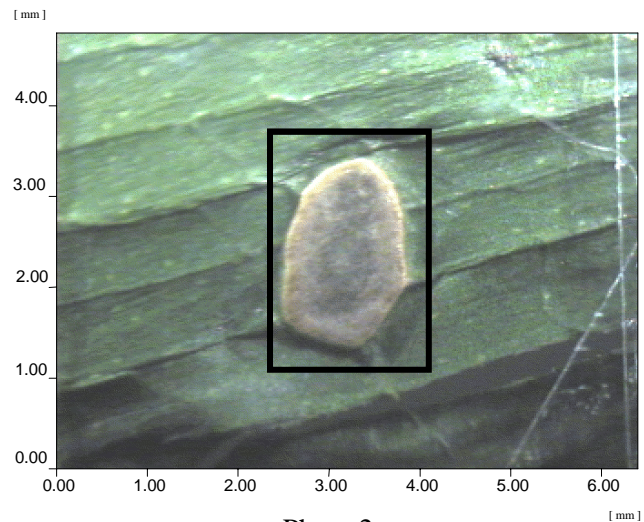
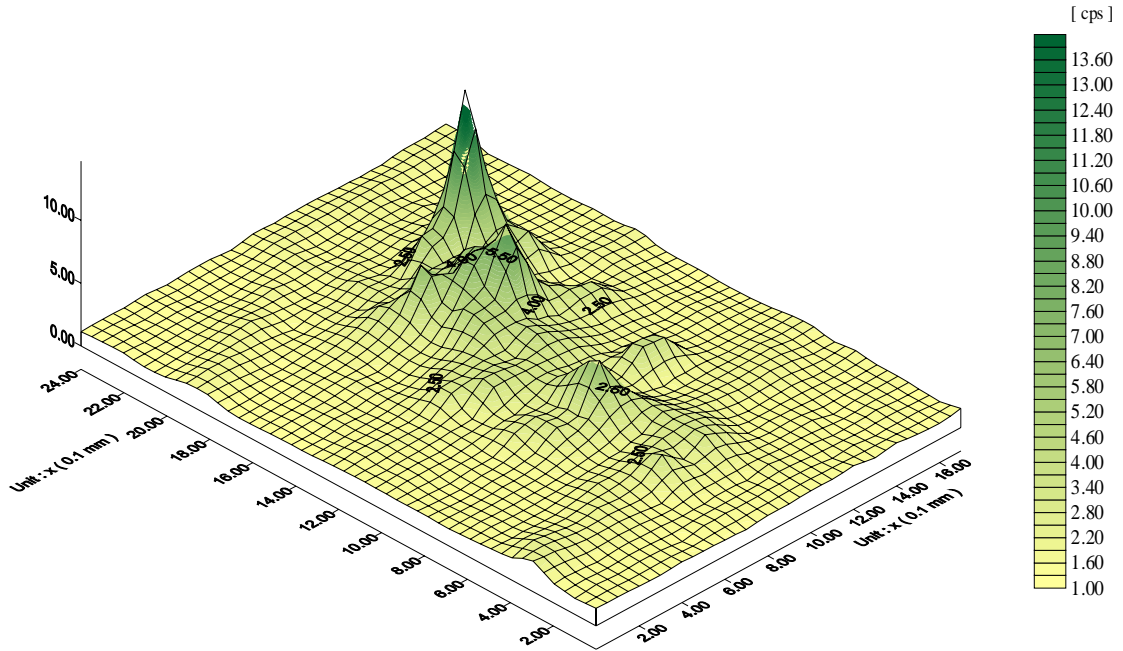
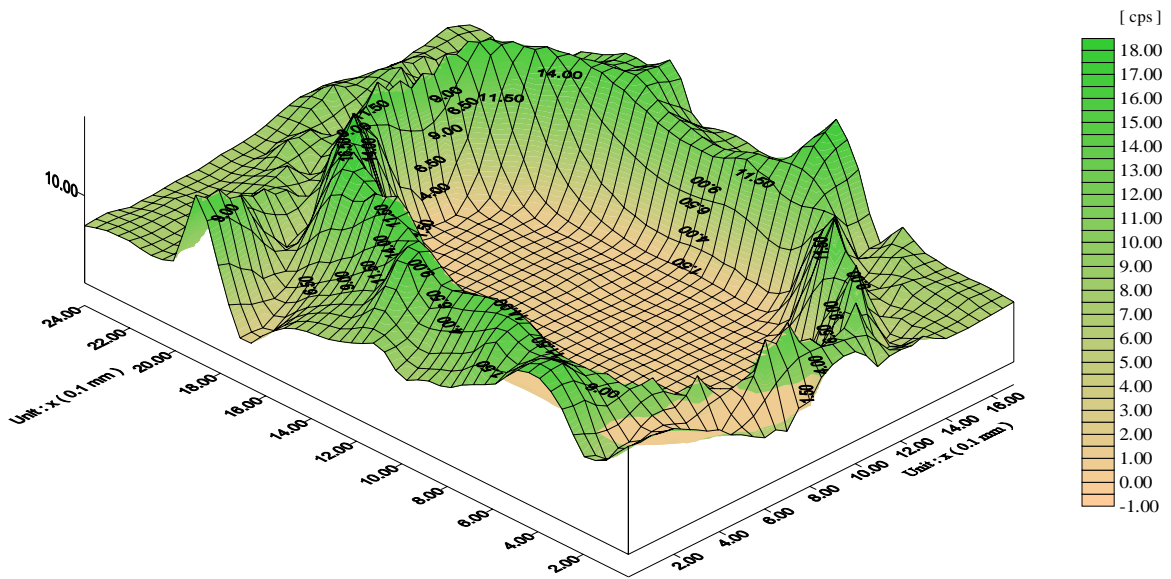


Photo 2

The map images reveal what cannot be seen visually: (1) Fe is unevenly distributed and (2) potassium (K) accumulates around the withered spot.



Fe counts



K counts

3. Mapping Example 2 (jam on bread)

1 ml of arsenic 1000 ppm atomic absorption standard solution was added to 10 g of jam. Arsenic laced jam was scattered at 11 spots on the left half of a piece of bread. Jam was spread on the right half of the bread and the arsenic laced jam was spread along a line on top of the jam (see Photo 3).

The map image below confirms in 3D the status of the arsenic laced jam.

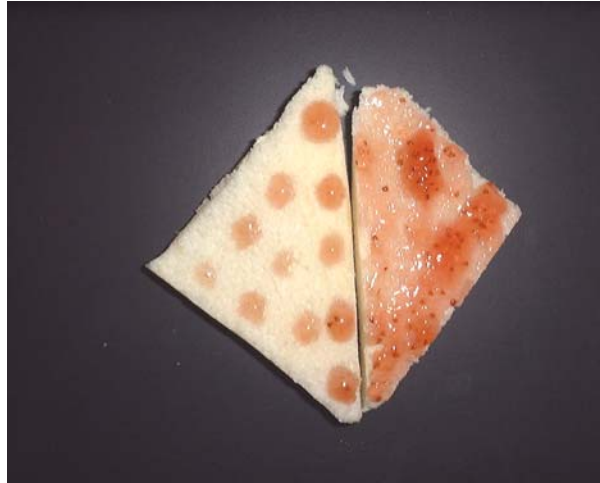
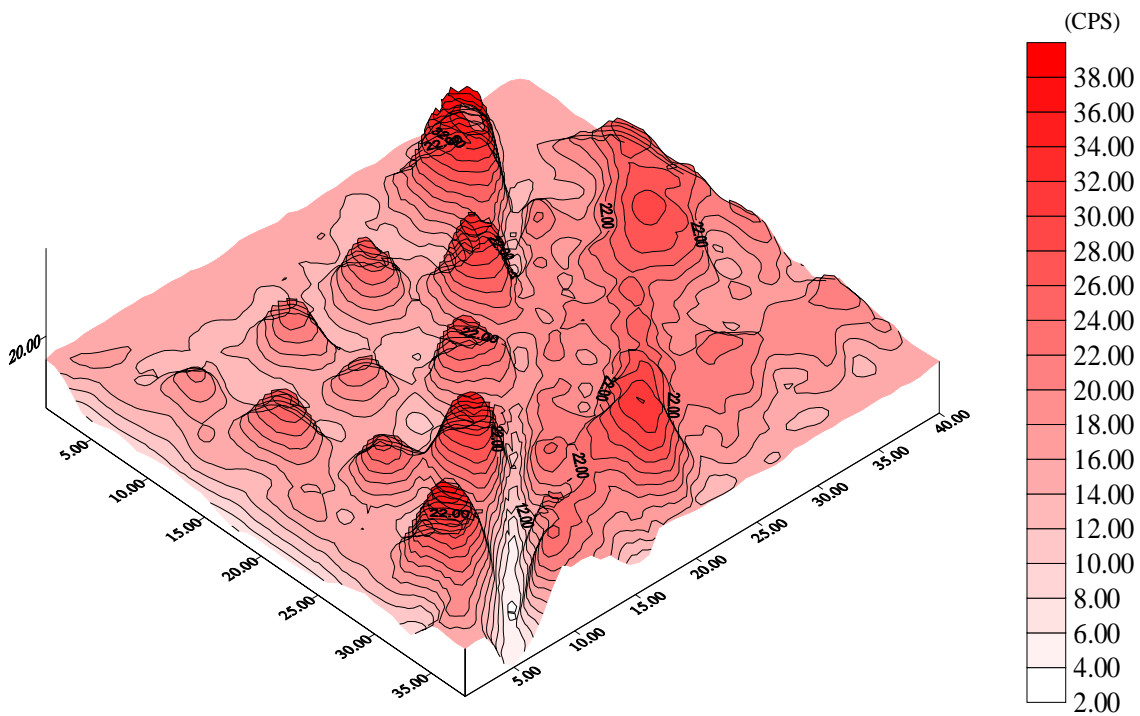


Photo 3



Plots of As counts