Application Note 012: Image Analysis of Coffee Beans

Introduction:

The objective of this preliminary study is to assess the potential of SeedCount to analyse coffee beans for roasted colour and size distribution.

Procedure

A total of 172 coffee beans were scanned using the SeedCount Image Analysis system. 86 beans were roasted and 86 beans were un roasted. The beans were placed into a corn tray, ie, the most appropriate tray for such large seeds, and scanned in colour using the SeedCount. Figure 1. Shows the image of these beans.

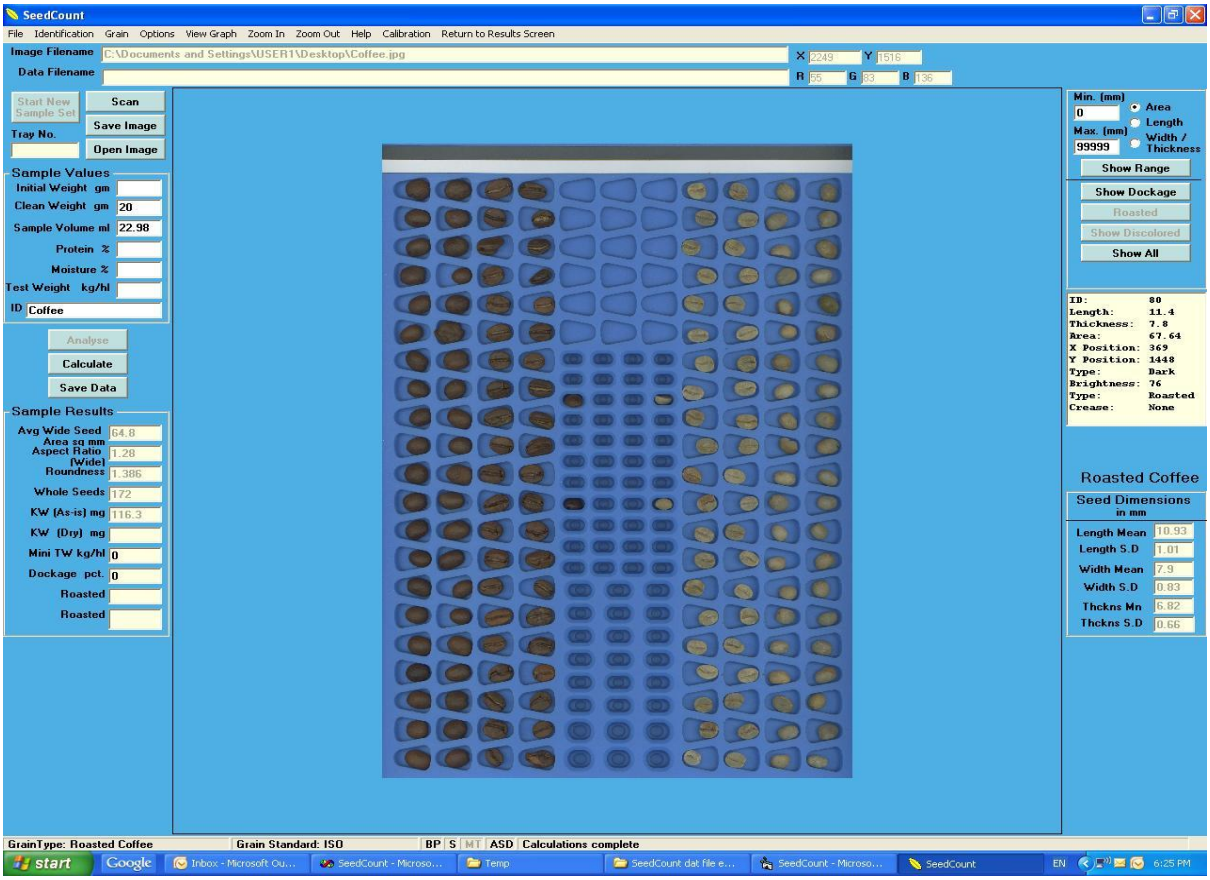

Figure 1. Seedcount Image of roasted and un roasted coffee beans.

Results

SeedCount scans each bean and records the length, width, area and colour in L,a,b and RGB colour scale coordinates.

Figures 2 and 3. show the distribution of the area for the roasted and unroasted beans.

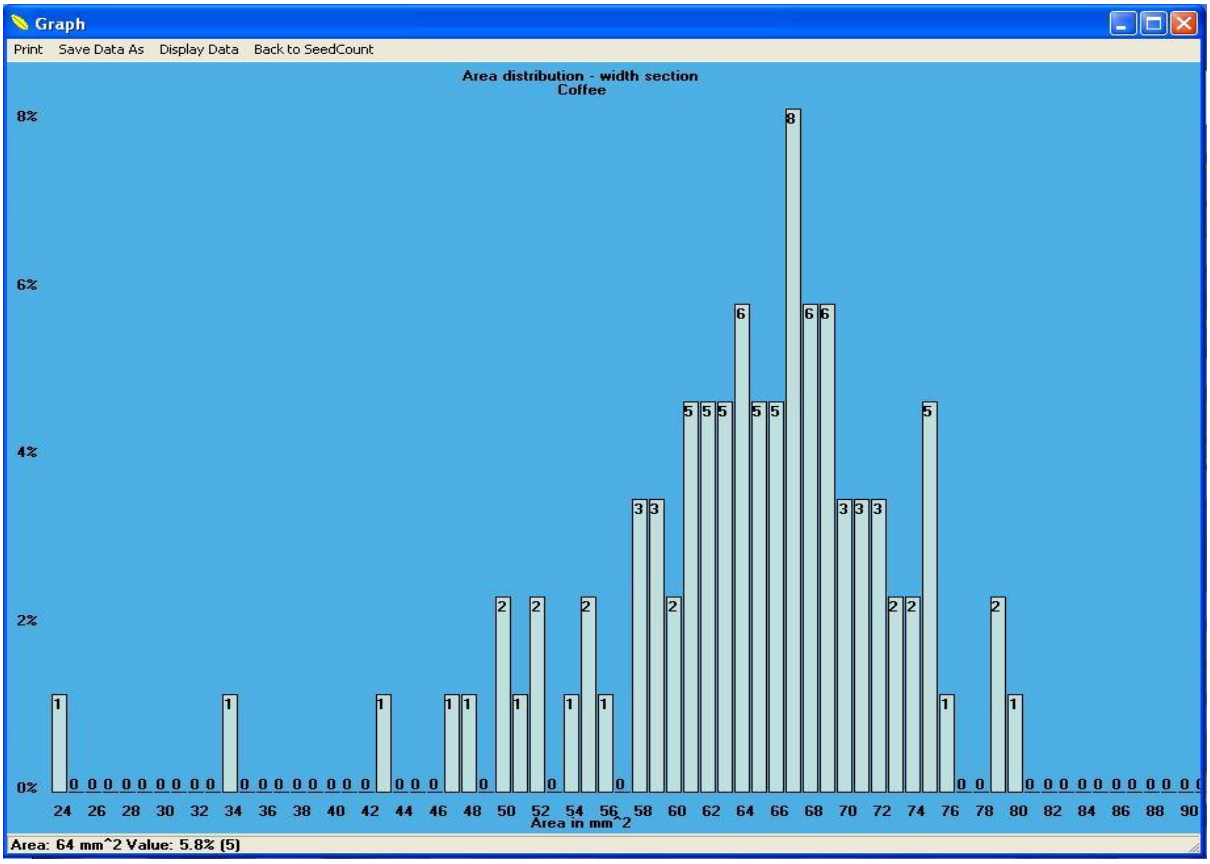

Figure 2. Area Distributiion for the Roasted Beans

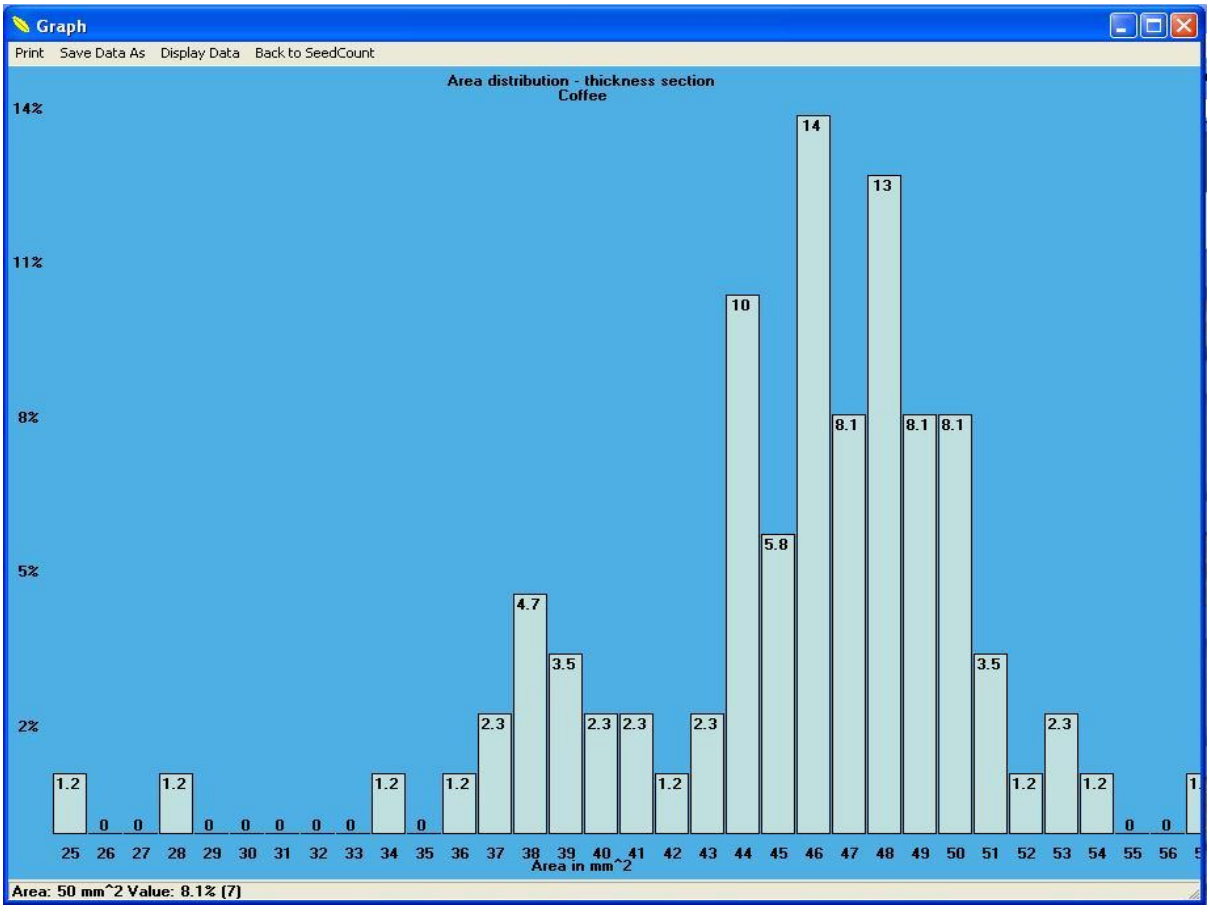

Figure 3. Area Distribution for the unroasted beans.

Figure 4. Shows the distribution of the L value, ie, lightness – darkness scale, of the beans. Note that the histogram is bi-modal, ie, demonstrates the distribution of the unroasted and the roasted beans.

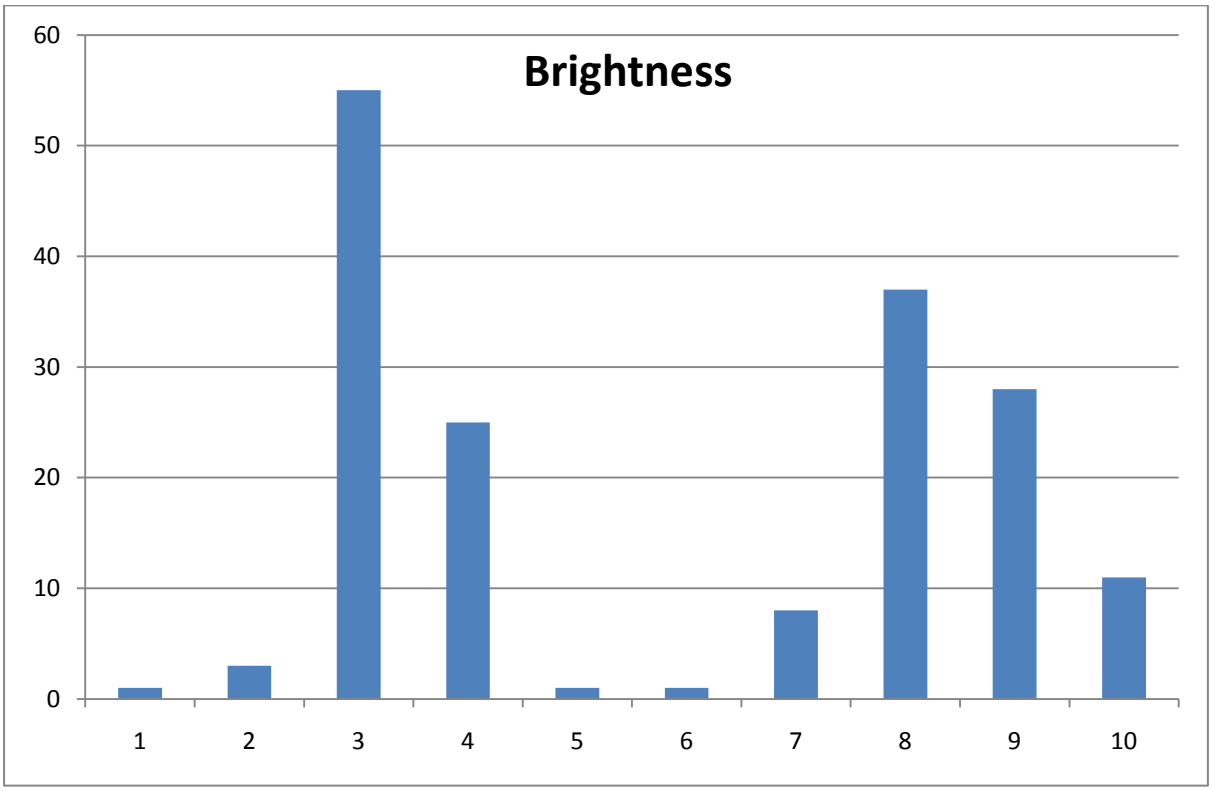

Figure 4. Distribution of the L scale, ie,lightness – darkness of the beans.

Discussion:

This study is intended to show the feasibility of using SeedCount to characterise coffee beans for size and colour. At present SeedCount has module, ie, applications for rice, corn, wheat and barley. Coffee is considered to be an ideal candidate for SeedCount. As such, based on this simple study it is considered that software can be developed to measure the size distribution, the colour distribution in L,a,b or RGB colour scales and to calibrate these colour measurements to the existing coffee colour grading process. It is also feasible to detect broken beans and beans that have spots or uneven colour distribution, for example burnt spots or mould in raw beans.