Application Note 015: Analysis of Philippine Rice Samples

Introduction:

SeedCount has proven to be an excellent source of physical measurement on different types of seeds. The objective of this study is to test the instrument's ability to accurately measure physical characteristics, like size and colour, of various rice seeds supplied from the Philippines.

Procedure

10 samples of various types of rice were supplied by the IRRI, Manilla, Philippines. Each sample has been described by the customer as follows:

SampleID
*00170
*00173
*00180
*00184
*00186
*00190
*00191
*00171-Med
*00178-Med
*00188-Med

Each sample was loaded into a SeedCount Rice Tray and scanned in reflectance mode. Figure 1 shows the image of sample 00170. A total of 156 seeds were counted.

SeedCount collects the image of the seeds and then draws a line around the edge. The length and width are calculated as the furthest two points vertically and horizontally as defined by the edge line. Broken seeds as classified as those seeds that have a length less than 75% of the average of the seeds being measured. Head Count is determined as the number of seeds that are still broken but have a length greater than 75% of the average length.

All the pixels within the edge lines are then used to determine defects including:

Chalk
Red Streak
Green Streak
Damages
Stained

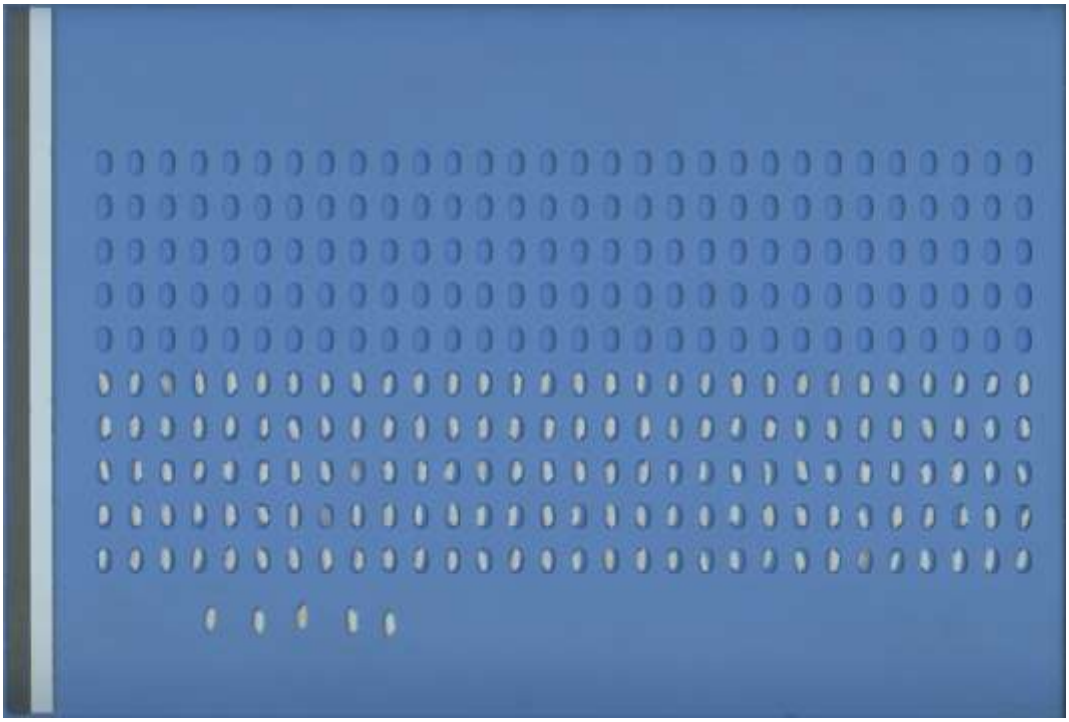


Figure 1 – Sample 00170 Image.

Results:

In the appendix, the images of each set of seeds are provided.

Table 1. provides a summary of the Count, Length, Width and Colour Data from SeedCount for each set of seeds.

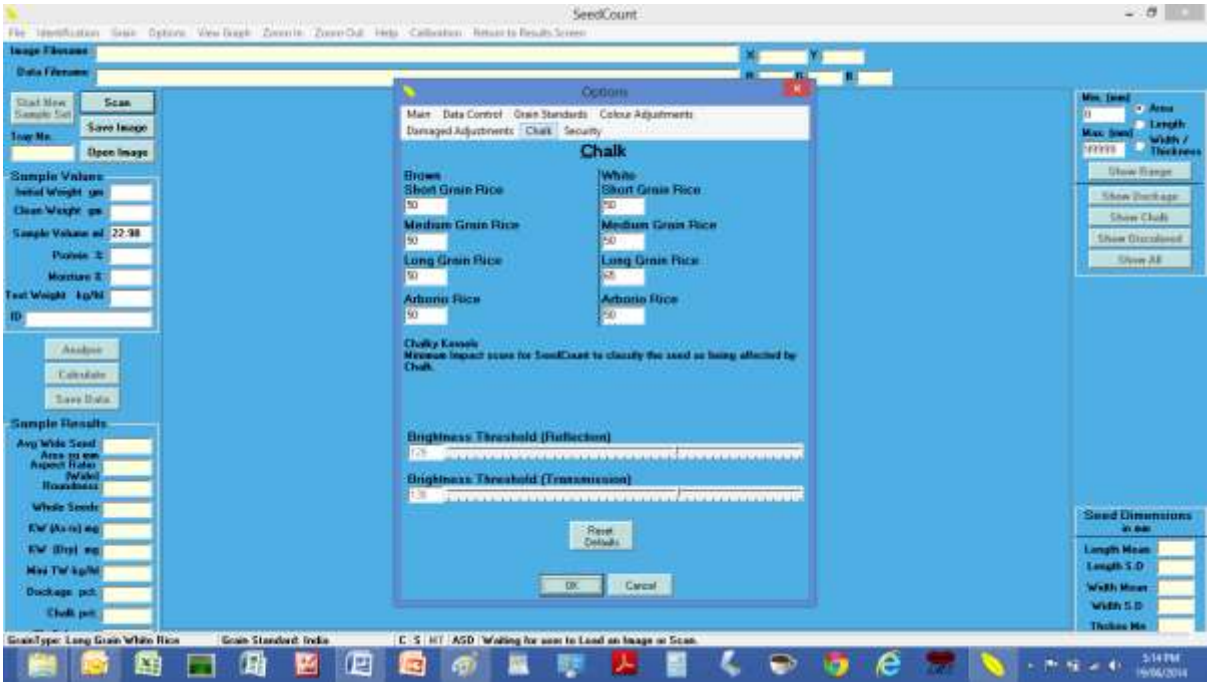
SampleID	Total Count	Av Width	Av Length	Av Area	Av CIE_L	Av CIE_a	Av CIE_b
*00170	156	2.70	6.68	12.13	80.07	0.07	1.65
*00173	198	2.47	6.92	11.48	65.03	0.03	-8.69
*00180	211	3.20	6.80	14.60	70.70	-0.58	-1.35
*00184	215	2.20	6.84	9.82	63.88	0.60	-13.23
*00186	242	2.40	6.41	10.32	74.15	-0.26	-4.62
*00190	186	2.87	6.95	12.12	65.46	-0.31	-7.56
*00191	249	2.83	6.41	12.12	66.57	2.45	2.82
*00171-Med	206	2.68	5.42	9.30	65.80	2.64	-6.45
*00178-Med	233	2.55	4.99	8.02	58.60	2.81	-14.72
*00188-Med	276	2.86	5.21	9.44	62.38	2.06	-8.78

Table 2. shows the Head Count, Broken Count, Chalkiness, Chalk Count, Damaged, Red Streak, Green Streak and Stained data as measured by SeedCount.

SampleID	Head Rice Count	Large Brokens Count	Medium Brokens Count	Small Brokens Count	Chalk Count	Chalk 0-10%	Chalk 10-25%	Chalk 25-50%	Chalk 50-75%	Chalk 75%+	Chalk Impact	RedStreak	RedSpeck	Green	Black Stained
*00170	10	4	0	0	149	6.3	0	0	4.2	89.6	83.25	0	5	0	0
*00173	23	6	0	0	1	97	2	0	0	1	1.14	2	7	0	6
*00180	16	1	0	0	15	43.4	20.8	23.6	9.4	2.8	19.71	0	52	0	1
*00184	16	15	0	0	0	100	0	0	0	0	0	0	0	0	0
*00186	16	9	0	0	125	21.7	14.2	22.5	34.2	7.5	38.48	0	9	0	0
*00190	10	4	0	0	2	92.6	4.1	1.6	1.6	0	2.25	0	4	0	1
*00191	20	12	0	0	28	31.8	17.1	29.5	19.4	2.3	27.43	128	112	0	0
*00171-Med	36	0	0	0	35	29.2	11.3	34	22.6	2.8	31.36	16	57	0	0
*00178-Med	27	2	0	0	0	98.4	1.6	0	0	0	0.19	0	0	0	0
*00188-Med	30	0	0	1	17	48.8	22.3	17.4	9.9	1.7	17.35	1	20	0	1

Discussion:

The results presented in this report have been prepared without any knowledge of the samples. SeedCount has a number of scale adjustments that are required to calibrate the system to match the human observation. Figure 2 shows the adjustments for Chalk. By moving the sliders left or right SeedCount can be setup to include less or more seeds as being Chalk affected. Likewise other colour parameters can be optimised to match the human observation.

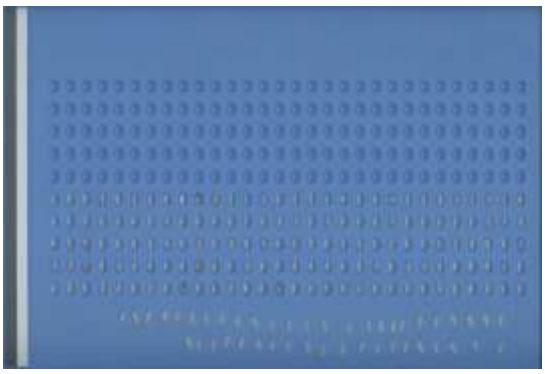


Once SeedCount has been optimised, then it can be used routinely for measuring the physical attributes of more seeds.

As such the results provided in this report may not be completely correlated with the human counting.

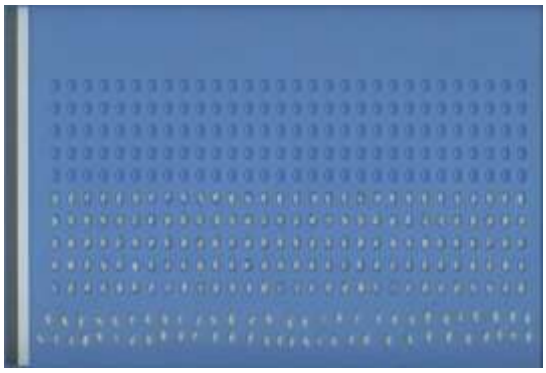
Appendix:

Sample 00171

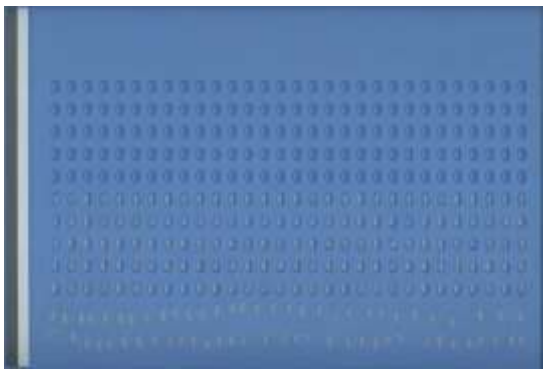


Sample 00173

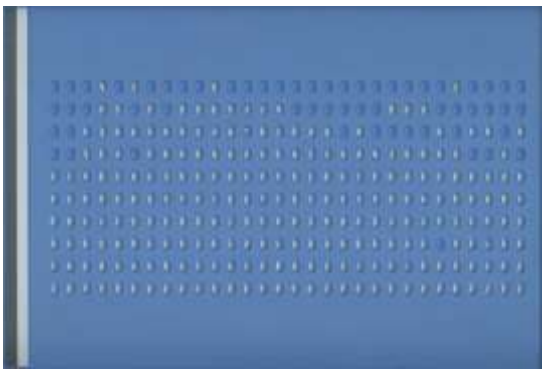
Sample 00178



Sample 00180

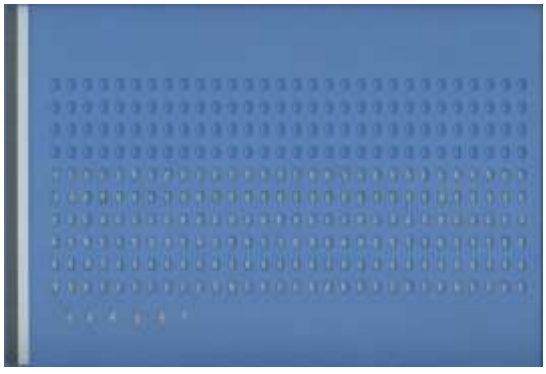


Sample 00184

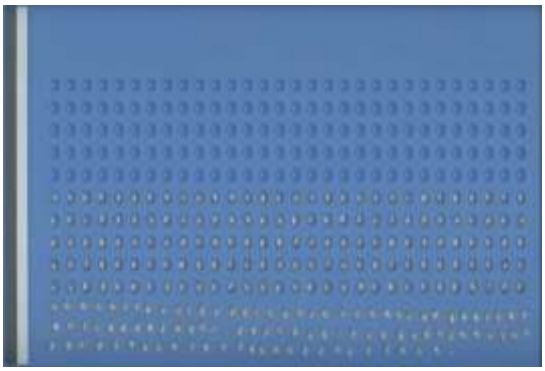


Sample 00186

Sample 00188



Sample 00190



Sample 00191