

CANTY

PROCESS TECHNOLOGY

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Lab Test Report

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Purpose: Mass Flow of Potatoes

Equipment used:

Standard Camera and 41 degree lens
Flood illumination
Black Backdrop
White Potatoes

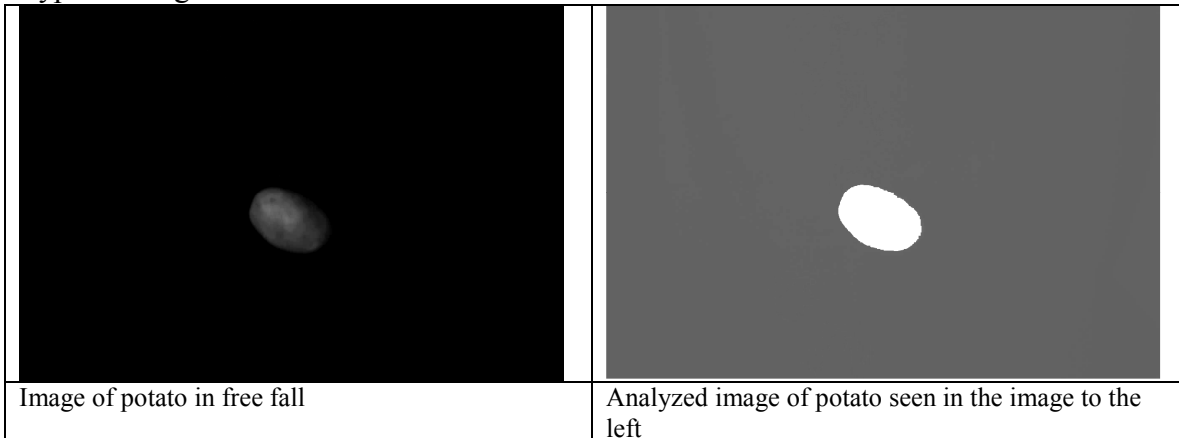
Introduction:

The test set up shown in Figure 1 is to assess the feasibility of measuring the mass flow of potatoes. The testing detailed herein is for potatoes in free fall off the end of the funnel tray. Testing in this manner allows the potatoes to accelerate away from each other under the force of gravity. This yields a very good, singular image of the potatoes.

Test Description:

Thirty potatoes were randomly selected to send down the funnel tray for measurement. Method used to do this was to load the potatoes onto the tray and then quickly push them off and let them fall in front of the camera.

Typical Image:



Data:

A first batch was tested 7 times with the following results:

Free Fall, Batch 1			
Trial #		Area (pixels)	Volume (pixels)
	1	557763	7.63E+07
	2	541741	8.00E+07
	3	583096	8.57E+07
	4	580264	8.37E+07
	5	553912	7.86E+07
	6	527007	7.00E+07
	7	547048	7.90E+07
	St Dev =	20224.81576	5105832.333
	Mean =	555833	7.90E+07

Table 1. Batch One Measurements.

The area measurement is the projected 2-D area of the potato as it is captured by the CantyVisionClient™ software. The volume is produced by multiplying the area by the Minor Diameter. This model is fairly well suited for the shape of a potato. Batch one was weighed and found to be 14.7 lbs. Equating this weight to the mean of the trial volumes produced a linear calibration curve (assuming 0 vol = 0 weight). A second batch was then selected and run under the same test conditions. The second batch weighed 13.3 lbs. An average of 4 trial runs produced an average calculated weight of 12.81 lbs.

Free Fall, Batch 2				
Trial #		Area (pixels)	Volume (pixels)	Weight (lbs)
	1	521223	7.16E+07	12.84
	2	519579	6.76E+07	12.12
	3	598843	7.70E+07	13.8
	4	547922	6.95E+07	12.47
	Std Dev		4059864.53	0.724034
	Mean		7.14E+07	12.81

Table 2. Batch 2 Check.

The testing done 4/12/10 morning was on a limited basis. Averages and deviations are calculated based on small data sets, however the results are good. Over much larger data sets the information would be more accurate with smaller deviations. Based on the limited testing Canty is confident the system would perform within the bounds indicated in this report.