Deutscher Tropentag - Bonn, 9-11 October 2001
Conference on International Agricultural Research for Development

Assessment of Post Harvest Soybean Seed Quality Loss.

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Abstract
The effects of mechanical treatment on quality of soybean (*Glycine max* (L) Merrill) seeds during processing were evaluated between December 1998 and April 1999. Soybean foundation seeds from Chiang Mai Field Crops Research Center grown in farmers' paddy fields were used as seed materials. The experiment was assigned as a split-plot design having 4 replications. Soybean seed variety was assigned as the main plot, and point of sampling in the processing line was assigned as the sub plot. Two varieties, SJ.5 and Chiang Mai 60, were investigated, and 11 processing sites were sampled. The results showed that the soybean seed moisture content after drying in the bin dryer varied with the distance from the central perforated ventilation pipe and the height of bin. The other seed samples were from the central perforated ventilation pipe. The higher they were placed in the bin, the higher was their remaining moisture content. Transportation of the seeds by bucket elevators after being dried at sampling sites 7 and 10 caused a higher percentage of mechanical damage in Chiang Mai 60. Pre-cleaning and air-screen cleaning decreased the inert matter from 0.50 % to 0.13 and 0.03 %, respectively. None of the sampling sites in the processing plant affected the germination and vigor of the seeds. However, SJ.5 showed better vigor than Chiang Mai 60.

Introduction
Soybean seeds qualities in the Tropics are low, due to its high rate of deterioration and have more seed damages because of their physiological characteristic (TeKrony et al, 1987). Processing of soybean Seed conditioning has many step that can made mechanical damage to the seed by seed processing machinery. Hence the study was undertaken to investigate loss of seed qualities each processing step.

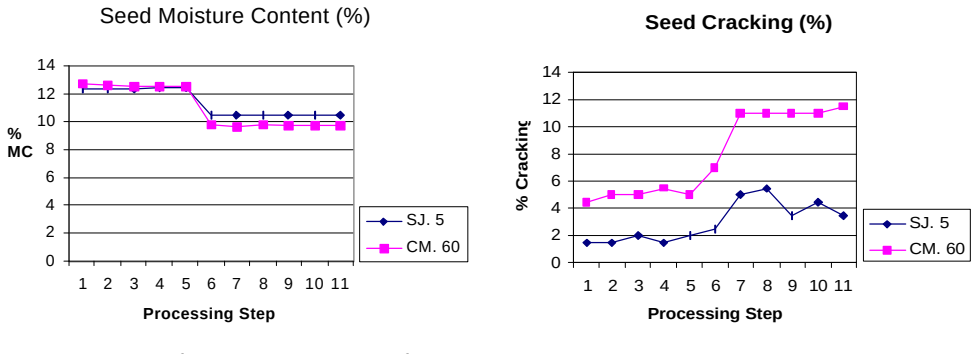
Materials and Methods
Two varieties of Soybean (CM.60 and SJ.5) were grown in Chiang Mai, Northern Thailand, then harvested by cutting method after that threshed by threshing Machine at speed of 450 rpm, 7000 Kg. of seed each variety were carried out to seed processing plant until packaging. Sampling the seed from every interval steps which were; threshed seeds (1), passed through bucket conveyer (2), after pre-cleaning (3), passed through bucket conveyer (4), in bin-dryer (5), after drying (6), passed through bucket conveyer (7), in storage bin before air-screen cleaner (8), after air-screen cleaner (9), passed

through bucket conveyer (10), packaging (11). Seed qualities determination; Seed Moisture Content (ISTA, 1993), Seed Cracking by Indoxyl acetate method (Paulsen and Nave, 1979), Seed Germination, Seed Vigor by Accelerated Aging test (ISTA, 1993), Seed Viability by TZ test (ISTA, 1993), and electrical Conductivity test (Perry, 1981)

Results

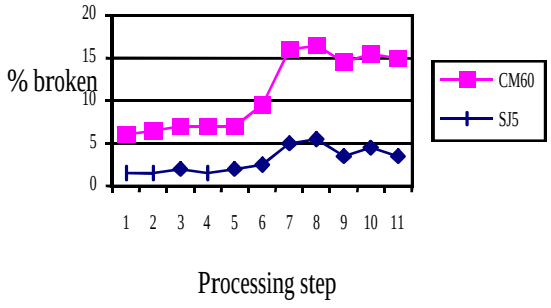
The effects of mechanical processing to the qualities of seed could be seen through their various characters. First on the seed moisture content it was found that on the 1st to 5th of the processing line the average moisture content of the seeds was 12.50 % whereas during the 6th to 11th processing step, all seeds drooped to app. 10.10 %.This was due to the process of drying which was done after the 5th step. CM60 showed better decreasing potency than SJ5

Figure 1 : The percentage of seed moisture content after processing 11 steps of variety SJ.5 and CM.60



The percentage of mechanical damage (breakage) by visual observation showed the high significantly difference between SJ5 and CM60 as shown in Fig.2. SJ5 was resulted only 0.44 % whereas CM60 was 3.37 %. There was no mechanical damage to SJ5 during all steps of processing, which CM60 was, affected more on the process step No.7 to No.11. Anyhow through Indoxil Acetate Test, it was found that there was higher number of breakage seed than that from visual observation number of breakage seed than that from visual observation SJ5 showed better result than CM60 by 3.0 % and 8.0 % respectively. After the 7th step of processing, the increasing of damage was in significantly difference from 1st to 6th steps in both varieties.

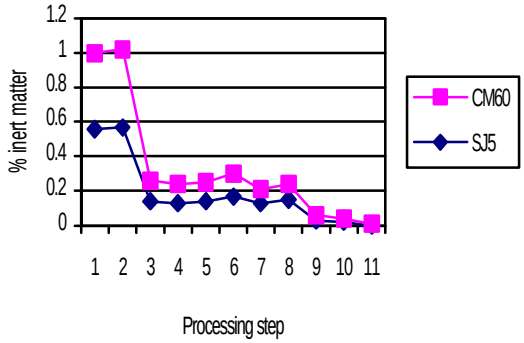
Figure 2 : Percentage of broken seed from indoxil acetate test of SJ5 and CM 60 soybean seed



Purity analysis : There was no significant different between two varieties after processing. Both seed was resulted the same trend. Processing steps resulted in seed

purity due to cleaning step. Before 1st and 2nd step there was more inert matter in the seed lots of app.0.5 %, after 2nd step the percentage of inert matter decreased to app.0.03 in the 9th step as in Figure 3

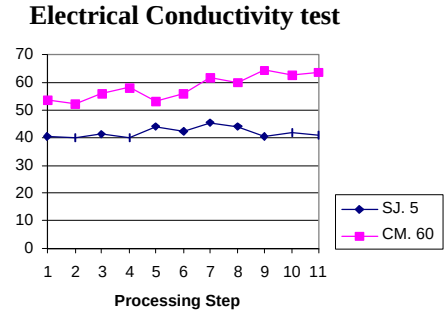
Figure 3 : Showed the percentage of innert matter during seed processing of soybean var SJ5 and CM60



Percentage of germination: the result showed that there was no significant different in the percentage of germination after processing in both varieties and in each step of processing. The seeds remained their viability app 87-88%

Vigor test: There were four different determining in vigor test. By using accelerate aging technique SJ5 showed better result of 76.5 % of germination while CM60 showed 71.8 %. The processing steps did not affected the seed vigor, the seed remained their vigor until the end of the process. The result was the same from soil emergence test and tetrazolium test. The electrical conductivity test provided some remarkable result, there was a significantly difference among two varieties. SJ5 showed better vigor by resulted less solute leakage (41.8 mmhos/s) whereas CM60 showed higher number of 58.5 mmhos/g. Processing steps resulted also no significant for both varieties.

Figure 4. Electrical conductivity test from soybean seed var SJ5 and CM60 (micromhos/g)



Discussion and Conclusion

Soybean var. CM60 has bigger size and thinner seed coat than SJ5 resulted to susceptible for mechanical damage and increase more on rate of deterioration. The processing line affected to seed qualities as improper bin dryer, which resulted un-uniformity in seed moisture. Transportation of the seed by bucket elevators caused high percentage of seed breakage especially during step 7th . Pre-cleaning and air screen cleaning were the most effective steps in this study. Anyhow every step of process resulted no significantly difference in seed qualities.

Acknowledgments
This research is an activity of the programme: Subject-related partnership between the University of Göttingen (Germany) and Chiang Mai University (Thailand) in the area of Academic Co-operation in Teaching and Research.

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