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

Investigation of Post-harvest Soybean Seed Storability after Passing the Different Steps of Processing

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Abstract
The effects on storability of soybean (*Glycine max* (L) Merrill) seed from different points on the processing line were evaluated between April and October 1999. Soybean foundation seeds from Chiang Mai Field Crops Research Centre grown in farmers' paddy fields were used as seed materials. The experiment was assigned as split-split plot design having 4 replications. The main plot was the sampling sites in the processing line, of which there were 11. The temperature in the storage room was the sub-plot. Two storage conditions were investigated: ambient condition and controlled temperature storage at 15-20°C. The sub-sub plot was the storage period. Seed samples were tested monthly for 6 months .The results showed that none of the sampling sites in the processing plant affected the germination and vigour of the seeds after being stored for different periods of time. However, SJ.5 showed better storability than Chiang Mai 60. Seeds stored in controlled temperature (15 - 20°C) had higher percentage of germination than those stored at the ambient temperature. Percentage of seed germination and seedling vigor decreased with time of storage. This study showed that Chiang Mai 60 decreased its equality faster than SJ.5.

Introduction
Soybean seeds longevity in tropical area 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 seed storability after different steps of processing and to determine its detrimental effects on seed vigor and seed germination.

Material and Methods
Two varieties of Soybean (CM.60 and SJ.5) were grown in Chiang Mai, Northern Thailand, then harvested by cutting method then threshed by threshing machine at speed of 450 rpm, 7000 Kg. of each variety were carried to seed processing plant to process until packaging . Sampling the seed from every interval steps are; 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) were carry out to storage in different condition ; ambient condition and controlled temperature at 15-20^{o}C. Seed samples were tested monthly for 6 months as follows Seed Germination (ISTA, 1993), Seed Vigor by Accelerated Aging test (ISTA, 1993), Seed Viability by TZ test (ISTA, 1993), and Electrical Conductivity test (Perry, 1981).

Results

Germination: the germination of soybean SJ.5 and CM.60 from every step of processing have no significantly difference. After of storage there was significantly difference during the 6 storage months as decreased from 88% to 78% in *var.* SJ.5 and decreased from 88% to 72% in *var.*CM.60. Controlled temperature storage resulted better seed germination than by ambient storage and there was an interaction between storage condition and storage period.

Figure 1. Soybean seed germeabilities during period 6 storage months in ambient and controlled temperature

SJ. 5 **CM.60**

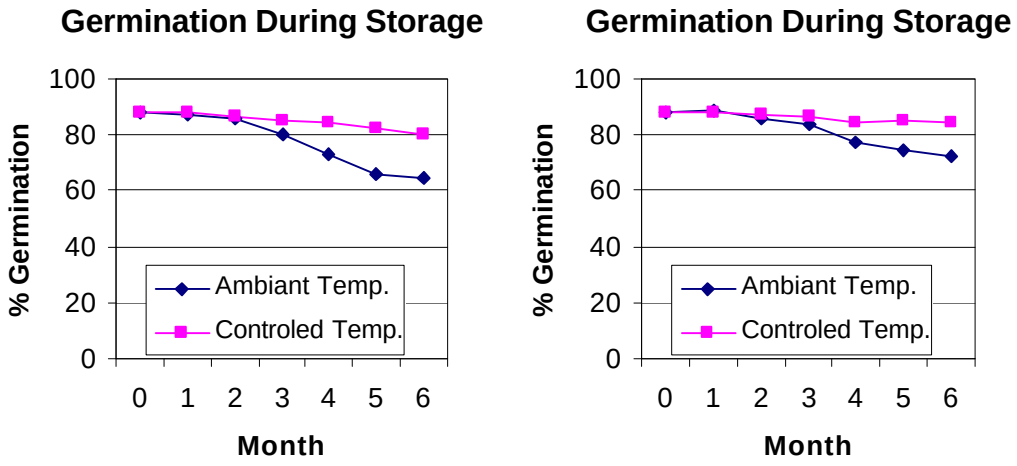


Figure 2. Soybean seed vigor during period 6 storage months in ambient and controlled temperature

SJ. 5 **CM.60**

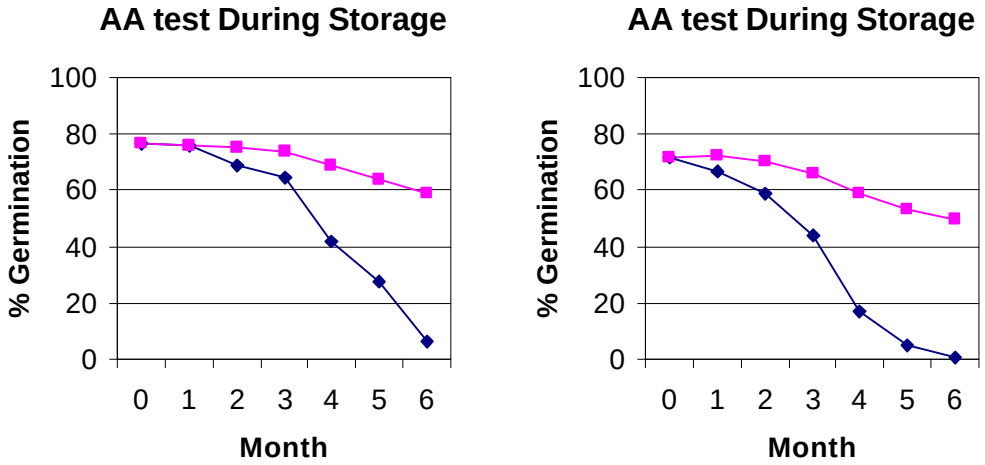


Figure 3. Soybean seed viability during period 6 storage months in ambient and controlled temperature

SJ. 5 **CM.60**

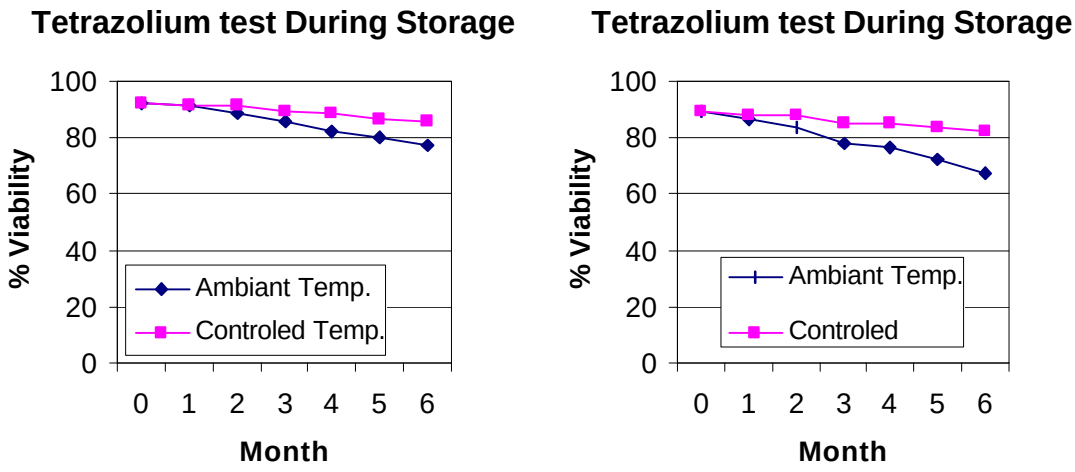
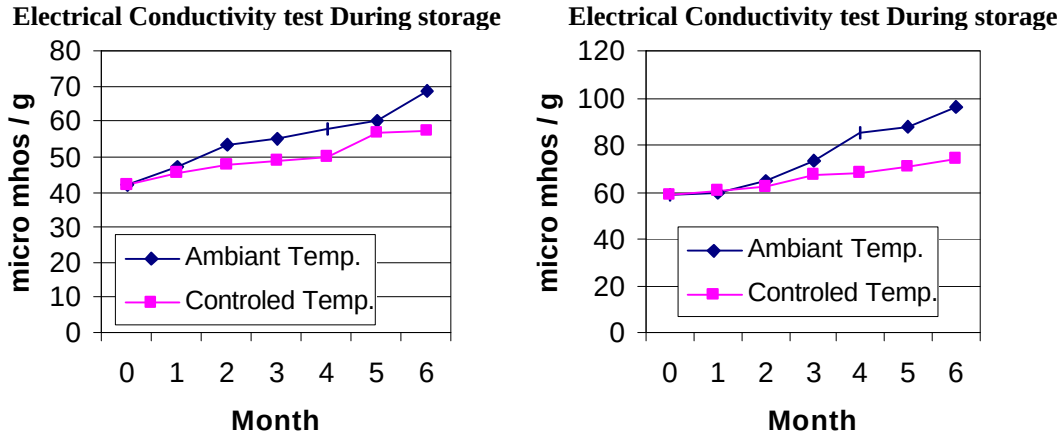


Figure 4. Soybean seed vigors during period 6 storage months in ambient and controlled temperature

SJ. 5 **CM.60**



Accelerated Aging Technique: There was no significant difference within step of processing in testing for seed vigor. Anyhow during 6 months storage it was highly significantly difference which markedly decreased from 74%germination to 32% germination in *var.* SJ.5 and 71%germination to 25%germination in *var.* CM.60. There was a highly interaction between storage condition and storage period which ambient storage was affected to decreasing in seed vigorous than controlled temperature storage.

Tetrazolium Test: Biochemical test for seed viability by tetrazolium test resulted that viability of both varieties of seed are not affect by steps of processing. By six months of storage the seed viability decreased from 92% to 81% in *var.* SJ.5 and from 89% to 74% in *var.* CM.60. Controlled temperature storage resulted the higher seed viability than by storing in ambient condition and there was an interaction between storage condition and storage period.

Electrical Conductivity Test: With this indirect seed vigor test, it was shown that the electrical conductivity of seed leakage stated the same trend in both varieties. Every processing step resulted higher in seed leakage. Period of storage affected seed vigor

more than various processing step CM60 showed less vigorous by this investigation than SJ5 after long storage period.

Discussion and Conclusion

Various investigations for assessment seed qualities stated the same results that seed processing affecting seed qualities less than storage conditions and period of storage. Controlled atmosphere seed storage at 15-20 ^{o}C and 3 month's storage are the most suitable for processed seeds in both varieties in this study

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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