

A10

## **Sink Source Relationship and True Harvest Index Response to Plant Density in Soybean [*Glycine max*(L.) Merr.]**

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### **Objectives**

The objective of this study is to compare true and apparent harvest index and sink source relationship response to plant densities.

### **Material and Methods**

Five soybean cultivars, Hwangkeumkong, Taekwangkong, Myungjunamulkong, Magellan and Maverick, were used. Plant densities were used with two, 60 X 15 and 60 X 30 cm. The experiment design was used split plot design. Dry weight was measured after oven-drying at 80°C for 48h (excluding roots). How to stretch a net was as follow; the upper part of the each plant was open and the lower part was tied the strings. Statistical analysis was used to SAS package and analysis of variance was conducted on the data using PROC ANOVA procedures.

### **Results and Discussion**

Plant dry weights were significant response to plant densities. Leaf number, pod number, seed number and pod water content were also significant according to plant densities but leaf water content was not. Crop growth rate except seed partitioning rate was significant response to plant densities. Harvest index of high plant density was larger than that of low density. Also, apparent harvest index was higher than true or actual harvest index according to plant densities. Harvest index showed the negative correlation with leaf dry weight and showed the positive correlation with pod dry weight, seed dry weight, seed growth rate, pod growth rate and seed partitioning rate. But, harvest index was not significantly correlated with stem dry weight. Harvest index did not show significantly different correlation coefficient with pod number and showed the negative correlation with leaf number, pod water content, leaf water content and mean leaf dry weight. Sink-source ratio showed strong correlation with harvest index and showed the negative correlation coefficient with leaf growth rate but did not with stem dry weight. As a result, this study showed that increment of harvest index was accomplished with complicated relations of seed filling period, sink strength including sink size and capacity, seed growth rate and environment effect including plant density. This experiment suggested that true harvest index could be practical index discriminating maximum seed yield.

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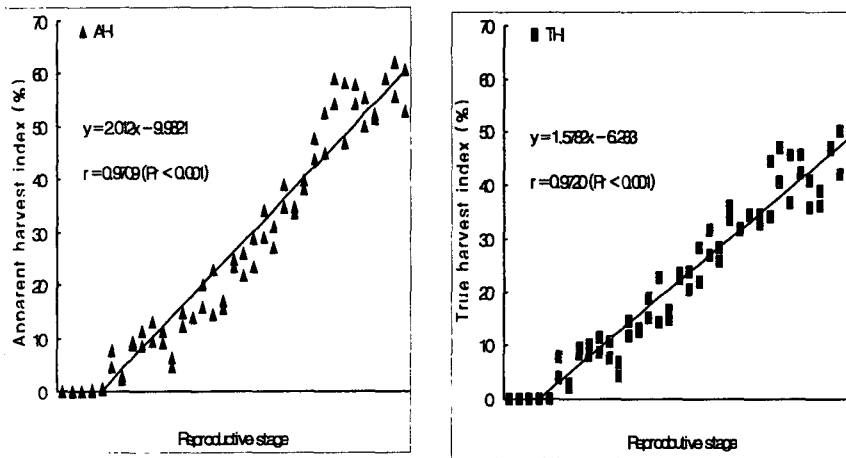


Fig. 1. Regression analysis of true harvest index and apparent harvest index response to reproductive stages.

AHI : Apparent harvest index

THI : True harvest index

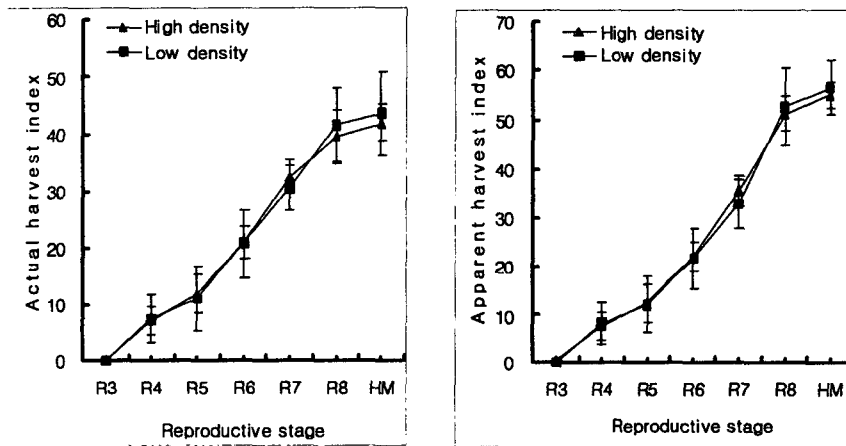


Fig. 2. True harvest index and apparent harvest index response to plant densities.

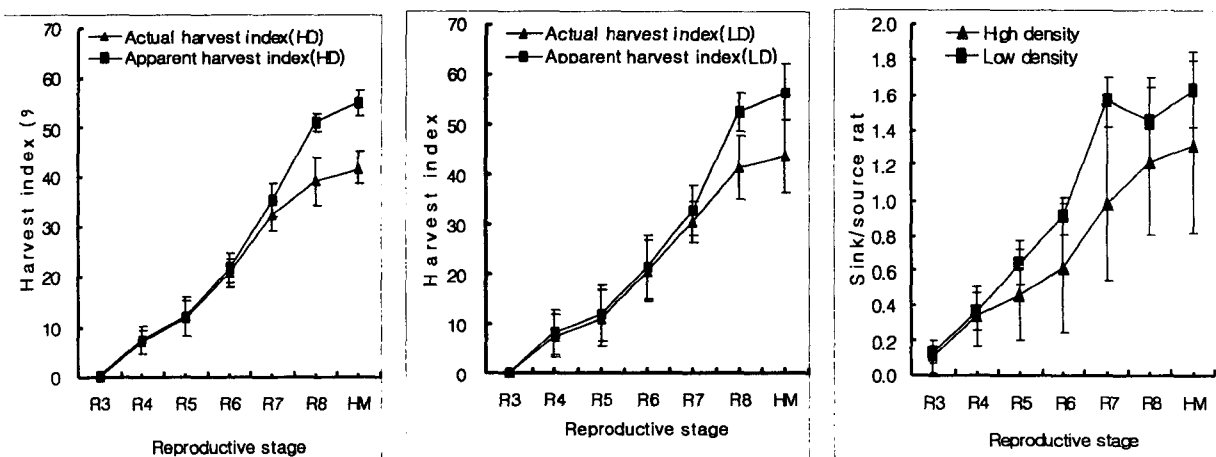


Fig. 3. True or actual harvest index, apparent harvest index and sink-source ratio at two plant densities.