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Comparison of Methods to Assess Dry Bean Yield of Different Cocoa Cultivars

MARION WURTZ¹, LAURA ARMENGOT¹, CHRISTIAN ANDRES¹, JOACHIM MILZ², FREDDY ALCON²,
MONIKA SCHNEIDER¹

¹*Research Institute of Organic Agriculture (FiBL), Dept. of International Cooperation, Switzerland*

²*ECOTOP, Consulting on Successional Agroforestry, Bolivia*

Abstract

To estimate the cocoa dry bean weight from the fresh weight a standard dry bean factor (DBF) ranging from 32% to 40% is usually applied. This factor, i.e. the relation between the dry bean weight (fermented and dried) and the fresh weight at pod opening, is used by cooperatives and factories that buy the fresh beans of the farmers. However, this factor is subjected to seasonal fluctuations and can be highly influenced by rainfall. Therefore, for instance, higher values are expected during the dry season compared with the rainy season.

The objective of this study was to evaluate the accuracy of the use of a standard fix DBF value compared with the use of actual DBF values periodically collected over the season for assessing the performance of 12 cocoa cultivars (clones and hybrids). We hypothesised that using the same DBF for different cultivars that may have the production peak at different times of the season can lead to over- or underestimations of the yield performance.

The study was performed in a long-term cocoa trial in Alto Beni, Bolivia, which comprises full-sun monocultures, agroforestry and successional agroforestry productions systems. In 2014, for each harvest date, cultivar and production system, a subsample of the fresh beans was collected, put in a mesh bag and weighted. After the fermentation and drying process, the subsamples were weighted again and the DBF was then calculated at 8% water content of the beans. The total performance of each cultivar at the end of the harvest season was estimated using the actual DBF for each cultivar, system and harvest date, and the results were compared with the performance estimated using the DBF values averaged across systems, harvest dates and varieties and also with the fixed DBF of 35%.

The results only showed minor differences in the overall performance of each cultivar when comparing the different methods used. However, for all the cultivars, using the 35% fix value gave the poorest estimation compared with any of the other DBF tested, mainly due to underestimation of the performance of the early maturing cultivars.

Keywords: Agroforestry , Bolivia, cultivar performance, fresh bean weight, monoculture