

Nutrient-Driven Yield Gains in Cocoa in Indonesia

Indonesia is the world's fourth most populous country, estimated at over 250 million (World Bank estimate for 2014). It has a total land area of 1,811,570 square km and 54,716 km of coastline. Arable land represents only 11% of the total land area with 7% supporting permanent crops. It is the largest economy in South East Asia. Cocoa has been grown in Indonesia for hundreds of years and since the 1980s, production grew rapidly and Indonesia became the third largest producer in the world with annual production of about 500,000 metric tons. Since the early 2000s, there has been an ongoing decline in quality and productivity, which has undermined cocoa farm profitability and presents a substantial risk to the survival of the industry.

International Plant Nutrition Institute (IPNI) has teamed up with Cocoa Care, a program established by PT Community Solutions International (PT CSI), and voluntarily supported by a number of highly experienced leaders in Indonesian cocoa sustainability to explore the ability of appropriate 4R Nutrient Stewardship-based fertilization to increase cocoa yields. Our ultimate aim is to overcome agronomic production difficulties in the cocoa sector and help farming families onto a solid path toward economic sustainability. IPNI and Cocoa Care have worked with farmers in Sulawesi, Indonesia to assess the yield potential of properly fertilized cocoa fields. Initial results were recently presented at the 3rd Asia Choco Cocoa Congress in Singapore. Current yield levels of smallholder farms in Sulawesi are around 500 kg of dried beans per hectare. Good agricultural practices (GAP) are usually not deployed in these farms, and little external fertilizer is applied.

IPNI and Cocoa Care worked with farmers to compare “GAP” and “GAP with 4R Nutrient Stewardship-based fertilization”. In their second program year, the participating farms reached about 1,000 kg of dry cocoa beans with GAP, and about 1,400 kg of dry beans with GAP and 4R Nutrient Stewardship-based fertilization. Essentially, the GAP treatment doubled the yield typically obtained in Sulawesi smallholder farms, and 4R Nutrient Stewardship-based fertilization increased yields by another 35 to 45% over GAP. Usually, smallholder farmers in Sulawesi harvest about 60 to 70% of their beans in a rather short period during June and September. The IPNI Cocoa Care intervention was highly successful in modifying the yield distribution in such a way that beans were harvested into November and December. This is a most important achievement as it improves cash flow and permits farmers to purchase external fertilizers for the application in December / January. Finally, farmers also reported an improved bean count. Bean count is a measure that is employed to gauge the size of the beans. About 100 g of beans are counted and the smaller the count numbers, the larger the

bean size. The GAP / 4R Nutrient Stewardship treatment decreased the bean count by 5% over the GAP only treatment – another indicator of the importance of adequate crop nutrition.



Photo (IPNI SEAP). Good agricultural practices trigger a healthy level of flowering – precondition for a good fruit set – and 4R Nutrient Stewardship-based fertilization ensures that most developed fruits reach their growth potential.