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Case Study 7.4-1 Use of decision support tool increased profitability of maize production in Indonesia. In the Indonesian maize growing regions of Central Lampung and North Sumatra, on-farm trials were conducted to validate Nutrient Expert. Within each region, results were drawn for each practice from five fields in close vicinity to one another.

The Nutrient Expert tool uses information about the field's nutrient supply that is derived either in omission plots or from site and management characteristics that serve as proxies for nutrient supply. The tool recommends rates and timings for application of N, P, and K that differ from the farmers' fertilization practices, which are based on generalized one-size-fits-all regional recommendations, or are estimates that usually do not consider precise site-specific indigenous nutrient supply.

In this case, nutrient supply was estimated from proxy information including soil texture, depth and color, as well as cropping and fertilization history. The attainable maize yield in these two favorable environments was estimated at 9 t/ha, and was used as the yield target for the season. Seed, fertilizer, and grain prices are actual values recorded when the trials were conducted.

On average, use of Nutrient Expert recommendations in Indonesia achieved higher yields with less fertilizer. The higher efficiency and profitability was attained by more closely matching the rate of each nutrient applied to the site's nutrient need, and through the use of improved timing, generally by increasing the number of split applications.

Table 1. Yield and profitability of maize production comparing the farmers' fertilization practice (FFP) based on traditional recommendations and the Nutrient Expert (NE) decision support tool.
Source: IPNI Southeast Asia (unpublished data).

Maize management parameters Values per hectare	Central Lampung		North Sumatra	
	FFP	NE	FFP	NE
Yield (15.5% moisture, t)	**7.60**	**8.99**	**8.20**	**9.03**
Revenue (USD)	**2,085**	**2,480**	**2,258**	**2,490**
Inorganic fertilizer cost (USD)	130	124	173	163
N (kg)	218	195	175	168
P_2O_5 (kg)	40	34	59	23
K_2O (kg)	23	34	42	53
Organic fertilizer cost (USD)	199	86	-	46
N (kg)	43	20	-	4
P_2O_5 (kg)	24	11	-	4
K_2O (kg)	41	18	-	4
Seed and fertilizer costs (USD)	444	322	286	321
Expected benefit (USD)	**1,640**	**2,158**	**1,972**	**2,169**

References

Pampolino, M. et al. 2011. IPNI, Penang, Malaysia. [On-line].
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