COMPANY: Coca-Cola



PRACTICE

Applying fertilizers only as needed affords significant cost savings for suppliers (and dramatically reduces emissions).

PROBLEM

Conventional fertilizers, which release nitrous oxide, a greenhouse gas that has about 300 times the warming power of CO₂, are responsible for a significant portion of Coca-Cola bottlers supply chain emissions.

- Manufacturing of conventional fertilizers is highly energy intensive. Also, because manufacturing fertilizer is natural-gas intensive, farmers (and our businesses) are additionally vulnerable to fuel costs.
- High difference between fertilizer usage on farms observed relative to same yields
- Farmers are untrained in best practices in placement of fertilizer and are not conducting soil/leaf analysis.

PROPOSED PRACTICE

1. CASE: OPTIMIZING FERTILIZER USE

Best practice fertilizer use relies on important factors including placement of the fertilizer and amount used. Globally, across Coca-Cola bottlers, fertilizer optimization (reducing excess fertilizer application) represents \$900 million/year potential cost avoidance for Suppliers. (This is based on McKinsey & Co analysis for European Juice business then extrapolated globally.)

By following best practices and reducing the fertilizer usage through better placement, Coke's supply chain emissions for Brazilian oranges could be reduced by ~8,000 t CO2e Observation leading to business case Model input parameters and sources High differences between fertilizer Parameter Source usage on farms observed - relative to Oranges sourced · Coke (concentrate sourced, Fertilizer (N-P-K) usage per same yields incl. Fanta) Lack of training of workers doing · Coltro et al. (research project ton of oranges soil/leafanalysis and placement of among 23 farms, details in Average practice fertilizers main reason - although backup) Best practice technology/practice already since many Agri research institute (FNP) Split of fertilizers (N-P-K) years introduced to sector IEA Cost of fertilizer (N-P-K) Production emissions (N-P40) Remarks regarding modeling * IFA · IFA, IPCC Application emissions (N) Based on total orange concentrate sourced only from Brazil1 Business case summary in t CO2e for EU juice business volumes Based on all Brazilian suppliers, i.e., all groves have implemented currently 17,992 Overview for 2016 only average practice CO₂e reduction : 8,039t No extra training costs yet added to from switching to business case best practice Annualized : ~2.4 mio USD Train the trainer concept savings Average Best Finance training through practice practice -301 USD Cost p.ton offset price 1 Can include volumes grown for Farta concentrate SOURCE: Teamaralysis McKinsey & Company | 2



BUSINESS CASE for BRAZIL ORANGES sourced by KO*

McKinsey conducted business case analysis and concluded that by following best practice and reducing fertilizer with better placement, KO can reduce emissions by $\sim 8,000t$ CO₂e in its Brazilian orange procurement. By following best practice fertilizer usage in all groves in Brazil from where it sources oranges, Coca-Cola's supply chain emissions for Brazilian oranges could be reduced $\sim 8,000t$ CO₂e. Current fertilizer application could be reduced by 45% to yield same effect and reduce carbon emissions.

CO₂e reduction from switching to best practice 8,039t

Annualized savings 2.4 million USD (offset price)

Cost per ton 301 USD (offset price)

*Costs of farmer training not included in business case; however savings could fund training through train the trainer model.

COMMENTS ON THE BUSINESS CASE

- Based on total orange concentrate sourced only from Brazil
- Based on the sample, all groves have only implemented average price.

