

(3) Cropping System Intensification	
Countries	23 (7 from Asia, 6 from LAC, and 10 from Africa) where the major cultivar group grown by small-scale farmers is substantial.
Cultivar groups considered	4 EAH AAA: East African countries (Burundi, Rwanda, Tanzania, and Uganda). AAB Plantain: All other African countries (Cameroon, Cote d'Ivoire, DRC, Ghana, Guinea, and Nigeria) and LAC countries (Cuba, Dominican Republic, Haiti, Honduras, Nicaragua, and Peru). AAA Cavendish and other AAA: most countries in Asia (Bangladesh, Myanmar, PNG, Sri Lanka, and Vietnam). Other AAA: Asian countries with considerable share of commercial Cavendish production (Indonesia and Philippines). Since the technology will be a package of specific agronomic practices, it seemed more realistic to focus on only one cultivar group (production system) first, though much of the generated knowledge will be applicable to other cultivar groups as well.
Current and likely future spread	100% of the target domain was considered for the assessment and no "affected area" estimates were necessary since this research option is not targeting a specific constraint.
Benefits: - Increase in yield - Reduction in postharvest losses	60% No effect
Production costs	50% increase mainly due to higher costs associated with increased use of fertilizer and irrigation.
Adoption ceiling	30% of the target domain in each of the countries 6-27% of the total national production area
Research period	10 years
Technology release	First adoption in 3 or 7 years depending on the country
Time from first adoption until estimated adoption ceiling will be reached	15 years for all countries Technology is more knowledge intensive and thus likely to spread slower than, for example, an improved variety.
Probability of success (up-take of technology)	80% for countries with stronger NARS and extension systems 50% for countries where challenges to make the innovation available to farmers will likely be larger
R&D costs	\$22.72 million
Additional country-level costs	\$22.72 million (matched 1:1 with R&D costs)
Remarks	We did not quantify and include the benefits from cropping system intensification realized through reduced yield variability and an improvement of the status of (on-farm) natural resources (e.g., increased soil fertility). Including these effects can be done, but would require models other than the economic surplus model and was thus not done in this first round of assessment. We note that this omission results in an underestimation of the benefits from this research option.
Resource persons	Charles Staver, Piet van Asten, Thierry Lescot

(3) Cropping system intensification

Country	Production	Area Targeted with Research	Current	Spread of Constraint in 25 Years	Adoption Ceiling
Burundi	371.05	54.91	100.00	100.00	30
Cameroon	184.41	58.75	100.00	100.00	30
Cote d'Ivoire	411.19	91.20	100.00	100.00	30
DRC	391.62	64.05	100.00	100.00	30
Ghana	191.75	87.61	100.00	100.00	30
Guinea	132.68	67.18	100.00	100.00	30
Nigeria	455.55	82.61	100.00	100.00	30
Rwanda	343.64	67.29	100.00	100.00	30
Tanzania	537.68	62.74	100.00	100.00	30
Uganda	1,763.98	76.74	100.00	100.00	30
Bangladesh	47.39	90.37	100.00	100.00	30
Indonesia	316.59	24.85	100.00	100.00	30
Myanmar	44.59	35.51	100.00	100.00	30
PNG	45.18	20.87	100.00	100.00	30
Philippines	391.88	20.74	100.00	100.00	30
Sri Lanka	52.04	37.91	100.00	100.00	30
Vietnam	102.17	59.66	100.00	100.00	30
Cuba	80.88	37.09	100.00	100.00	30
Dom. Republic	65.89	55.19	100.00	100.00	30
Haiti	64.07	53.18	100.00	100.00	30
Honduras	30.56	26.91	100.00	100.00	30
Nicaragua	14.46	59.26	100.00	100.00	30
Peru	107.50	69.77	100.00	100.00	30

Source: Production from FruiTrop (2010); threatened and affected area and adoption ceiling estimates from resource persons.

(3) Cropping system intensification (continued)

Country	Adoption Ceiling (% of total area) (At_{max})	Years to First Adoption (t_0)	Years to At_{max}	Yield Increase (%)	Reduction in Postharvest Losses (%)	Change in Input Costs (%)	Probability of Success (%)
Burundi	16	3	15	60	0	50	50
Cameroon	18	3	15	60	0	50	50
Cote d'Ivoire	27	3	15	60	0	50	80
DRC	20	7	15	60	0	50	80
Ghana	26	3	15	60	0	50	50
Guinea	20	7	15	60	0	50	80
Nigeria	25	7	15	60	0	50	50
Rwanda	20	7	15	60	0	50	50
Tanzania	19	3	15	60	0	50	80
Uganda	23	3	15	60	0	50	80
Bangladesh	27	7	15	60	0	50	80
Indonesia	11	3	15	60	0	50	80
Myanmar	11	7	15	60	0	50	50
PNG	6	3	15	60	0	50	80
Philippines	14	3	15	60	0	50	80
Sri Lanka	11	7	15	60	0	50	80
Vietnam	18	3	15	60	0	50	80
Cuba	11	7	15	60	0	50	80
Dom. Republic	17	7	15	60	0	50	80
Haiti	16	3	15	60	0	50	80
Honduras	8	7	15	60	0	50	80
Nicaragua	18	3	15	60	0	50	80
Peru	21	3	15	60	0	50	80

Source: Expert estimates.