

(5a) Breeding resistant plantain varieties: Release of available improved first- or second-generation AAB plantain hybrids	
Countries	18 (8 African countries, 1 Asian country, 9 LAC countries) where plantains are widely grown.
Cultivar groups considered	1 Since efforts to develop high-yielding varieties resistant to major pests and diseases (specifically nematodes, weevils, and BLS) are focused on AAB plantain , only production area currently grown with this cultivar group was considered.
Current and likely future spread	The biotic constraints addressed through the resistant varieties are very widespread in the target domain, so it was assumed that 100% of the plantain area in the included countries is currently affected by the constraints and will continue to be affected over the next 25 years without major intervention.
Benefits:	
- Increase in yield	70%
- Reduction in postharvest losses	25%
Production costs	Increase of 40% due to more expensive seed
Adoption ceiling	10–70% of the target domain in the included countries 2–46% of the total national production area
Research period	none
Technology release	Adoptable varieties would be available to farmers in 7 years (the existing improved material would be subjected to 4 years of multi-locational testing and 3 subsequent years of on-farm testing)
Time from first adoption until estimated adoption ceiling will be reached	8-15 years depending on the country
Probability of success (up-take of technology)	30–80% The probability of success is moderate since the available plantain hybrids have integrated banana streak virus (BSV) which will limit the adoption in some countries. Differences in the probability of success are further driven by the extension capacity and infrastructure in the respective country.
R&D costs	\$11 million
Additional country-level costs	\$11 million (matched 1:1 with R&D costs)
Resource persons	Rony Swennen (EAHB, plantain); Frédéric Bakry (plantain, sweet acid), Edson Perito Amorim (sweet acid)

New plantain breeding program (NEW) and Release of existing 2nd generation plantain hybrids (RELEASE)

Country	Production Area ('000 ha)	Share of Plantain = Target Domain (% of total area)	Current Spread of Constraint (% of target domain)	Spread of Constraint in 25 Years without Major Intervention (% of target domain)	Adoption Ceiling NEW (% of target domain)	Adoption Ceiling RELEASE (% of target domain)
Cameroon	184.41	58.75	100.00	100.00	60	50
Congo	20.93	77.48	100.00	100.00	20	10
DRC	391.62	64.54	100.00	100.00	20	10
Gabon	25.37	86.71	100.00	100.00	40	30
Ghana	191.75	87.61	100.00	100.00	60	50
Cote d'Ivoire	411.19	91.20	100.00	100.00	60	50
Liberia	27.75	81.98	100.00	100.00	20	10
Nigeria	455.55	82.61	100.00	100.00	60	50
India	1,858.28	9.33	100.00	100.00	30	20
Brazil	498.45	6.50	100.00	100.00	80	70
Colombia	461.43	71.79	100.00	100.00	70	60
Costa Rica	61.22	14.70	100.00	100.00	80	70
Ecuador	266.88	37.47	100.00	100.00	60	50
Honduras	30.56	26.91	100.00	100.00	50	40
Mexico	86.06	18.59	100.00	100.00	70	60
Nicaragua	14.46	59.26	100.00	100.00	40	30
Panama	15.35	50.34	100.00	100.00	50	40
Venezuela	79.79	59.89	100.00	100.00	50	40

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

Release of existing 2nd generation plantain hybrids (RELEASE)

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 (%)
Cameroon	29	7	10	70	25	40	50
Congo	8	7	15	70	25	40	50
DRC	6	7	15	70	25	40	50
Gabon	26	7	10	70	25	40	50
Ghana	44	7	10	70	25	40	70
Cote d'Ivoire	46	7	10	70	25	40	80
Liberia	8	7	10	70	25	40	50
Nigeria	41	7	10	70	25	40	80
India	2	7	15	70	25	40	40
Brazil	5	7	8	70	25	40	40
Colombia	43	7	8	70	25	40	30
Costa Rica	10	7	8	70	25	40	40
Ecuador	19	7	8	70	25	40	30
Honduras	11	7	8	70	25	40	30
Mexico	11	7	8	70	25	40	30
Nicaragua	18	7	8	70	25	40	30
Panama	20	7	8	70	25	40	30
Venezuela	24	7	8	70	25	40	30

Source: Expert estimates.