(4b)	**Breeding resistant EAHB varieties: New breeding program to develop improved EAHB varieties**
Countries	**6** African countries where EAHB 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 **AAA EAH** genome, only this cultivar group and corresponding production area are considered.
Current and likely future spread	The biotic constraints addressed through the resistant varieties are very widespread in the target domain, so we assumed that **100% of the EAHB area** in the included countries is currently affected by these constraints and will continue to be affected over the next 25 years without major intervention.
Benefits: - Increase in yield - Reduction in postharvest losses	 **60%** **25%**
Production costs	**30% increase** due to more expensive seed, but scale effects due to increased availability and thus lower costs per unit seed, assuming that more labs will be operating at the time the improved material will be available for introduction.
Adoption ceiling	**60% of the target domain** in all included countries **3-46% of the total national production area** Since the material available from a new breeding effort would perform better than the release of existing material, it was considered reasonable to assume a higher adoption ceiling.
Research period	**9 years**
Technology release	Adoptable varieties would be available to farmers **in 17 years** (the 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	**8-12 years** depending on the country
Probability of success (up-take of technology)	**50-80%** The probability of success is high and is mainly driven by the extension capacity and infrastructure in the respective country.
R&D costs	**$13.65 million**
Additional country-level costs	**$13.65 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 EAHB breeding program (NEW) and Release of existing 2nd generation EAHB hybrids (RELEASE)

Country	Production Area ('000 ha)	Share of EAHB = 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)
Burundi	371.05	54.91	100.00	100.00	60	40
Cameroon	184.41	4.22	100.00	100.00	60	40
DRC	391.62	6.89	100.00	100.00	60	40
Rwanda	343.64	67.29	100.00	100.00	60	40
Tanzania	537.68	62.74	100.00	100.00	60	40
Uganda	1,763.98	76.74	100.00	100.00	60	40

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

New EAHB breeding program (NEW)

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	33	17	10	60	25	30	60
Cameroon	3	17	8	60	25	30	70
DRC	3	17	12	60	25	30	50
Rwanda	40	17	8	60	25	30	80
Tanzania	19	17	10	60	25	30	70
Uganda	46	17	8	60	25	30	80

Source: Expert estimates.