

Article

Supplementary Materials: Seed set patterns in East African Highland Cooking bananas are dependent on weather before, during and after pollination

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Table S1. Correlation coefficients between daily weather attributes at the time of pollination of ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ with ‘Calcutta 4’ from January 2016 to January 2019 (n= 704)

	T@3pm	T@9am	T2M	T2MMax	T2MMin	T2MRNG	TS	Sol. Rad.	RF	RH@9am	RH@3pm
T@9am	0.178***	-									
T2M	0.895***	0.140***	-								
T2MMax	0.889***	0.040	0.977***	-							
T2MMin	0.728***	0.295***	0.864***	0.752***	-						
T2MRNG	0.778***	-0.125***	0.816***	0.916***	0.424***	-					
TS	0.861***	0.101**	0.984***	0.969***	0.838***	0.820***	-				
Sol. Rad.	0.854***	0.089*	0.696***	0.699***	0.536***	0.634***	0.651***	-			
RF	-0.259***	0.010	-0.280***	-0.286***	-0.235***	-0.249***	-0.225***	-0.170***	-		
RH@9am	-0.240***	0.196***	-0.112**	-0.117**	-0.087*	-0.108**	-0.067	-0.348***	0.337***	-	
RH@3pm	-0.646***	-0.117***	-0.601***	-0.627***	-0.450***	-0.587***	-0.552***	-0.625***	0.270***	0.306***	-
RH2M	-0.708***	0.233***	-0.785***	-0.842***	-0.548***	-0.823***	-0.770***	-0.600***	0.484***	0.255***	0.554***

*P<0.05, **P<0.01, ***P<0.001, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, T2M – Average temperature at 2 meters, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, TS – Earth skin temperature, Sol. Rad. – Solar radiation, RF – Rainfall, RH@9am – Relative humidity at 9am, RH@3pm – Relative humidity at 3pm, and RH2M – Relative humidity at 2 meters.

Table S2. Correlation coefficients of weather attributes and seed set adjusted to 100 fruits per bunch at 15 day intervals between 105 and 15 days before pollination in ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

	DBP	T@3pm	T@9am	T2M	T2MMax	T2MMin	T2MRNG	TS	Sol. Rad.	RF	RH@9am	RH@3pm	RH2M	n
‘Enzirabahima’	105	-0.116	-0.039	-0.106	-0.092	-0.137	-0.045	-0.083	-0.018	0.075	0.134	0.033	0.083	174
‘Mshale’	105	-0.052	-0.031	-0.058	-0.073	-0.063	-0.068	-0.067	0.080	0.004	-0.048	0.072	0.055	90
‘Nshonowa’	105	0.011	0.070	0.004	-0.032	-0.060	-0.012	-0.009	0.214*	0.072	-0.017	0.129	0.065	100
‘Enzirabahima’	90	-0.088	0.006	-0.056	-0.034	-0.110	0.035	-0.029	-0.005	0.042	0.062	-0.076	0.023	174
‘Mshale’	90	-0.028	-0.076	0.005	0.032	-0.056	0.082	0.009	0.041	-0.040	-0.096	-0.027	-0.112	90
‘Nshonowa’	90	0.055	-0.136	0.133	0.158	-0.075	0.234**	0.139	0.055	0.102	0.060	-0.072	-0.120	100
‘Enzirabahima’	75	-0.006	0.028	0.041	0.048	-0.030	0.078	0.056	-0.006	-0.071	0.023	-0.064	-0.018	174
‘Mshale’	75	0.177	-0.165	0.142	0.211*	-0.060	0.315**	0.147	0.180	-0.134	-0.016	-0.191	-0.205	90
‘Nshonowa’	75	0.278**	-0.093	0.340***	0.368***	0.116	0.413***	0.335***	0.206*	-0.214*	0.073	-0.290**	-0.328***	100
‘Enzirabahima’	60	-0.044	0.037	0.000	0.027	-0.087	0.093	0.011	-0.042	0.035	0.022	-0.094	-0.010	174
‘Mshale’	60	0.147	-0.283**	0.263*	0.314**	0.147	0.360***	0.247*	0.121	-0.002	-0.001	-0.049	-0.368***	90
‘Nshonowa’	60	0.334***	-0.198*	0.389***	0.456***	0.120	0.513***	0.387***	0.249*	-0.048	0.149	-0.371***	-0.438***	100
‘Enzirabahima’	45	0.031	0.038	0.063	0.108	-0.100	0.200**	0.054	0.188*	-0.057	0.051	-0.247**	-0.096	174
‘Mshale’	45	0.161	-0.224*	0.184	0.280**	-0.030	0.394***	0.213*	0.105	-0.037	0.200	-0.098	-0.290**	90
‘Nshonowa’	45	0.319**	-0.190	0.325***	0.413***	0.051	0.508***	0.323	0.182	-0.042	0.225*	-0.349***	-0.426***	100
‘Enzirabahima’	30	0.016	0.112	0.071	0.089	0.003	0.114	0.066	0.060	0.071	0.183*	-0.133	-0.019	174
‘Mshale’	30	0.196	-0.097	0.383***	0.395***	0.326**	0.348***	0.399***	0.052	-0.179	-0.029	-0.087	-0.393***	90
‘Nshonowa’	30	0.279**	-0.173	0.365***	0.410***	0.267**	0.415***	0.386***	0.115	-0.225*	0.010	-0.361***	-0.413***	100
‘Enzirabahima’	15	0.196**	0.149*	0.196**	0.172*	0.179*	0.125	0.172*	0.192*	-0.077	-0.122	-0.294***	-0.111	174
‘Mshale’	15	0.445***	0.164	0.421***	0.404***	0.433***	0.330**	0.414***	0.161	-0.200	0.000	-0.160	-0.373***	90
‘Nshonowa’	15	0.488***	0.121	0.487***	0.488***	0.492***	0.406***	0.482***	0.236*	-0.074	-0.038	-0.307**	-0.434***	100

*P<0.05, **P<0.01, ***P<0.001, DBP – days before pollination, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, T2M – Average temperature at 2 meters, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, TS – Earth skin temperature, Sol. Rad. – Solar radiation, RF – Rainfall, RH@9am – Relative humidity at 9am, RH@3pm – Relative humidity at 3pm, RH2M – Relative humidity at 2 meters, and n – Number of observations

Table S3. Correlation coefficients of weather attributes and seed set adjusted to 100 fruits per bunch at 15 day intervals between 0 and 120 days after pollination in ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

	DAP	T@3pm	T@9am	T2M	T2MMax	T2MMin	T2MRNG	TS	Sol. Rad.	RF	RH@9am	RH@3pm	RH2M	n
‘Enzirabahima’	0	0.210**	0.122	0.214**	0.207**	0.204**	0.148	0.187*	0.181*	-0.001	-0.071	-0.260***	-0.154*	174
‘Mshale’	0	0.074	0.148	0.120	0.129	0.121	0.105	0.209*	-0.029	0.139	0.265*	0.132	-0.020	90
‘Nshonowa’	0	0.030	-0.063	0.201*	0.214*	0.210*	0.166	0.266**	-0.099	0.057	0.129	0.025	-0.151	100
‘Enzirabahima’	15	0.085	0.123	0.139	0.121	0.143	0.078	0.139	0.052	0.035	-0.016	-0.165*	-0.003	174
‘Mshale’	15	-0.054	0.202	-0.011	-0.036	-0.006	-0.054	0.006	-0.061	0.034	0.149	0.132	0.088	90
‘Nshonowa’	15	-0.186	0.152	-0.111	-0.131	-0.078	-0.141	-0.061	-0.330***	0.049	0.323**	0.269**	0.229*	100
‘Enzirabahima’	30	0.027	0.150*	0.079	0.068	0.078	0.046	0.082	0.043	0.118	0.015	-0.170*	0.020	174
‘Mshale’	30	-0.011	0.360***	-0.094	-0.105	-0.071	-0.118	-0.080	0.011	0.149	0.122	0.145	0.208*	90
‘Nshonowa’	30	-0.163	0.337***	-0.104	-0.128	-0.026	-0.177	-0.077	-0.249*	0.023	0.150	0.260**	0.231*	100
‘Enzirabahima’	45	0.073	0.209**	0.042	0.029	0.085	-0.020	0.021	0.068	0.080	-0.007	-0.164*	0.083	174
‘Mshale’	45	-0.134	0.113	-0.200	-0.208*	-0.212*	-0.174	-0.211*	-0.109	0.298**	0.116	0.298**	0.324**	90
‘Nshonowa’	45	-0.269**	0.219*	-0.292**	-0.304**	-0.233*	-0.322**	-0.288**	-0.273**	0.265**	0.301**	0.411***	0.395***	100
‘Enzirabahima’	60	0.000	0.183*	0.059	0.018	0.153*	-0.091	0.029	0.019	0.066	0.011	-0.045	0.071	174
‘Mshale’	60	-0.250*	0.024	-0.213*	-0.237*	-0.173	-0.228*	-0.223*	-0.207	0.144	0.238*	0.341**	0.278**	90
‘Nshonowa’	60	-0.272**	0.288**	-0.296**	-0.333***	-0.178	-0.403***	-0.326***	-0.201*	0.012	0.276**	0.250*	0.404***	100
‘Enzirabahima’	75	-0.050	0.175*	-0.072	-0.072	-0.018	-0.094	-0.070	-0.097	0.057	0.028	-0.006	0.165*	174
‘Mshale’	75	-0.210*	0.168	-0.191	-0.181	-0.188	-0.141	-0.193	-0.215*	-0.095	0.231*	0.333**	0.237*	90
‘Nshonowa’	75	-0.275**	0.239*	-0.340***	-0.344***	-0.250*	-0.367***	-0.366***	-0.328***	-0.112	0.179	0.277**	0.409***	100
‘Enzirabahima’	90	-0.087	0.126	-0.019	-0.041	0.060	-0.108	-0.024	-0.067	-0.074	0.003	-0.056	0.111	159
‘Mshale’	90	-0.063	-0.005	-0.064	-0.028	-0.160	0.089	-0.110	-0.067	-0.175	-0.067	0.100	-0.096	81
‘Nshonowa’	90	-0.293**	0.106	-0.307**	-0.333**	-0.203	-0.383***	-0.364***	-0.317**	-0.027	0.042	0.264*	0.291**	93
‘Mshale’	105	-0.064	0.145	-0.091	-0.079	-0.069	-0.074	-0.111	-0.165	-0.068	0.109	0.154	-0.043	81
‘Nshonowa’	105	-0.236*	0.096	-0.304**	-0.297**	-0.253*	-0.283**	-0.341***	-0.196	-0.121	-0.027	0.122	0.091	93
‘Mshale’	120	-0.032	-0.133	-0.001	0.071	-0.105	0.182	-0.014	-0.185	-0.115	0.219	0.060	-0.187	81
‘Nshonowa’	120	-0.340***	-0.336***	-0.277**	-0.256*	-0.240*	-0.210*	-0.276**	-0.347***	-0.005	0.127	0.188	-0.005	93

*P<0.05, **P<0.01, ***P<0.001, DAP – days after pollination, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, T2M – Average temperature at 2 meters, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, TS – Earth skin temperature, Sol. Rad. – Solar radiation, RF – Rainfall, RH@9am – Relative humidity at 9am, RH@3pm – Relative humidity at 3pm, RH2M – Relative humidity at 2 meters, and n – Number of observations.

Table S4. Analysis of variance means squares of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes between 105 days before pollination and 60 days after pollination for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Source	105 DBP			90 DBP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
Regression	42.0	2,993.1***	258.4***	45.1*	3182.4***	261.1***
Residual	32.7	759.7	67.3	31.1	605.3	67.9
Change	37.9	2,705.9***	161.4**	46.8	3393.9***	241.2***
r ²	8.6	56.9	64.6	12.8	65.7	64.3
Source	75 DBP			60 DBP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
Regression	35.8	3036.3***	260.4***	51.1**	3210.1***	259.1***
Residual	35.7	724.5	69.1	28.2	582.6	65.9
Change	36.3	2741.8***	222.2***	52.2**	2947.9***	210.7***
r ²	0.1	58.9	63.6	21.1	67.0	65.3
Source	45 DBP			30 DBP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
Regression	51.1**	3103.0***	284.8***	49.1*	3171.9***	256.9***
Residual	28.2	670.0	27.1	29.2	613.8	69.9
Change	37.4	2606.8***	197.0***	45.3*	2771.7***	209.6***
r ²	21.1	62.0	85.7	18.4	65.2	63.3
Source	15 DBP			0 DAP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
Regression	44.9	3172.6***	285.9***	56.6***	3067.3***	265.3***
Residual	31.2	613.2	17.8	25.5	699.2	54.9
Change	36.9	1894.9***	209.0***	56.7***	2462.7***	202.7***
r ²	12.7	65.2	90.7	28.7	60.4	71.1
Source	15 DAP			30 DAP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
Regression	43.6	2935.6***	266.5***	45.3*	3158.7***	263.4***
Residual	31.9	806.7	52.6	31.0	624.5	58.2
Change	40.0	3012.7***	192.1***	33.5	2898.6***	203.0***
r ²	10.8	54.3	72.3	13.2	64.6	69.4
Source	45 DAP			60 DAP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
Regression	46.7*	3234.6***	263.5***	50.8**	3128.3	263.5***
Residual	30.4	562.6	58.0	28.4	649.3	58.1
Change	41.3	2972.3***	224.7***	45.0*	3071.9	201.3***
r ²	15.0	68.1	69.5	20.6	63.2	69.5

*P<0.05, **P<0.01, ***P<0.001, DBP – days before pollination, DAP - days after pollination, and r² – Percentage variability accounted for by the regression model

Table S5. Analysis of variance means squares of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes between 75 and 120 days after pollination for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Source	75 DAP			90 DAP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
Regression	46.9*	3053.4***	263.2***	46.9*	3293.9***	280.9***
Residual	30.3	710.5	58.6	30.4	550.4	35.9
Change	44.4	2770.4***	205.6*	43.0	3259.1***	235.2***
r ²	15.3	59.7	69.2	16.2	71.4	82.3

Source	105 DAP		120 DAP	
	‘Mshale’	‘Nshonowa’	‘Mshale’	‘Nshonowa’
Regression	3360.8***	225.4	3266.7***	251.5**
Residual	483.4	156.8	577.6	98.8
Change	2688.3***	159.8	2644.9***	227.8*
r ²	74.9	22.7	70.0	51.3

*P<0.05, **P<0.01, ***P<0.001, DAP - days after pollination, and r² – Percentage variability accounted for by the regression model

Table S6. Analysis of variance degrees of freedom of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes between 105 days before pollination and 120 days after pollination at 15 day intervals for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Source	105 DBP – 75 DAP			90 – 120 DAP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
Regression	56	40	63	55	40	62
Residual	114	49	35	100	40	29
Change	-40	-23	-45	-39	-23	-44

DBP – days before pollination, DAP - days after pollination

Table S7. Accumulated analysis of variance mean squares of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes 105 and 90 days before pollination for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Change	105 DBP			90 DBP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
T@3PM	182.2*	7382.7**	907.6***	107.9	1602.0	7.5
T@9AM	4.8	165.7	301.4*	0.2	390.2	360.0*
RF	1.9	228.8	28.0	1.4	401.3	235.3
RH2M	1.5	604.3	69.9	45.4	6654.5**	32.6
RH@3PM	22.1	2032.6	676.9**	71.4	5.9	9.4
RH@9AM	199.9*	97.4	0.7	12.6	586.3	51.2
Sol. Rad.	3.4	991.2	851.2**	1.0	261.2	52.8
T2MMax	0.1	886.6	297.9*	6.1	20.0	278.4
T2MMin	2.2	4174.0*	3377.2***	2.1	3729.9*	465.3*
T2MRNG	3.7	1167.4	475.6*	19.0	494.3	1655.4***
T2M	1.6	1506.2	391.0*	4.4	709.7	1406.1***
TS	51.6	922.0	566.5**	135.6.*	876.7	17.9
Bunch size	90.3*	7465.9***	178.3*	61.7	6700.6***	167.2*
T@3PM.Bunch size	50.6	9237.9***	106.2	49.0	596.1	40.5
T@9AM.Bunch size	24.1	1796.0	123.7	48.9	3767.9**	169.5
RF.Bunch size	19.2	488.2	267.9**	28.1	1039.9	299.5**
RH2M.Bunch size	19.9	14573.1***	368.3**	20.2	6691.9***	93.8
RH@3PM.Bunch size	21.7	372.0	81.5	40.1	700.8	82.7
RH@9AM.Bunch size	103.1*	313.0	116.3	87.4*	3350.9**	47.5
Sol. Rad.Bunch size	2.4	1716.7	43.5	28.2	2281.1**	79.7
T2MMax.Bunch size	74.7	118.5	129.7	30.9	13773.4***	316.0**
T2MMin.Bunch size	13.1	493.5	142.9	137.3**	3704.0**	569.0***
T2MRNG.Bunch size	15.3	1.1	266.9*	31.2	1047.0	171.1
T2M.Bunch size	101.7*	290.4	150.5	7.6	637.9	1217.6***
TS.Bunch size	30.2	496.3	214.5*	59.0	0.4	150.8
Residual	32.7	759.7	67.3	31.1	605.3	67.9

*P<0.05, **P<0.01, ***P<0.001, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, RF – Rainfall, RH2M – Relative humidity at 2 meters, RH@3pm – Relative humidity at 3pm, RH@9am – Relative humidity at 9am, Sol. Rad. – Solar radiation, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, T2M – Average temperature at 2 meters, TS – Earth skin temperature, and DBP – days before pollination

Table S8. Accumulated analysis of variance mean squares of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes 75 and 60 days before pollination for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Change	75 DBP			60 DBP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
T@3PM	0.8	4911.2*	1432.9***	14.4	3371.3*	2068.9***
T@9AM	5.1	3985.2*	371.9*	8.3	13692.7***	673.3**
RF	40.4	1259.9	477.7*	1.9	282.0	0.2
RH2M	6.3	211.0	25.5	68.1	9336.3***	1396.3***
RH@3PM	19.8	19.0	68.2	87.4	3245.9*	173.7
RH@9AM	5.1	5500.1**	1019.6***	12.7	3077.7*	985.4***
Sol. Rad.	2.3	1481.2	52.1	33.5	362.2	73.8
T2M	66.8	1801.8	24.3	4.7	190.2	14.9
T2MMax	4.2	7995.0**	338.2*	140.1*	3691.4*	453.8*
T2MMin	127.5	1235.2	557.7**	152.0*	6.8	56.8
T2MRNG	65.5	2847.6	739.9**	26.2	112.0	122.2
TS	5.5	485.5	154.8	5.0	6381.1**	37.5
Bunch size	51.1	5331.4***	184.1*	54.8	3370.5***	131.1
MaxT.Bunch size	31.4	989.4	44.8	49.6	904.1	85.5
MinT.Bunch size	12.3	1459.9	193.6*	34.3	1531.8	79.4
RF.Bunch size	10.0	447.5	281.4**	30.4	506.1	51.5
RH2M.Bunch size	50.3	4451.6**	210.1*	18.2	7144.4***	209.6*
RH@3PM.Bunch size	89.4	572.0	205.8*	32.1	1437.9	80.3
RH@9AM.Bunch size	102.5*	18790.8***	35.9	36.2	12882.3***	29.2
Sol. Rad.Bunch size	5.5	234.3	14.7	145.0**	2939.4*	350.4**
T2M.Bunch size	22.6	873.9	234.4*	25.0	2107.0*	595.5***
T2MMax.Bunch size	31.1	1657.4	135.4	179.3***	2628.6*	59.6
T2MMin.Bunch size	13.5	1624.4	359.3**	38.9	475.9	589.6***
T2MRNG.Bunch size	25.5	496.4	1136.8**	43.4	1153.2	375.7**
TS.Bunch size	32.0	9.2	285.5*	23.1	200.0	385.1**
Residual	35.7	724.5	69.1	28.2	582.6	65.9

*P<0.05, **P<0.01, ***P<0.001, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, RF – Rainfall, RH2M – Relative humidity at 2 meters, RH@3pm – Relative humidity at 3pm, RH@9am – Relative humidity at 9am, Sol. Rad. – Solar radiation, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, T2M – Average temperature at 2 meters, TS – Earth skin temperature, and DBP – days before pollination

Table S9. Accumulated analysis of variance mean squares of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes 45 and 30 days before pollination for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Change	45 DBP			30 DBP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
T@3PM	4.5	4070.6*	1893.8***	1.3	6043.1**	1447.8***
T@9AM	5.4	7945.6**	736.3***	69.4	1714.1	819.0**
RF	19.3	670.8	1.1	32.8	4605.8**	438.0*
RH2M	111.4*	1852.6	1453.5***	104.4	19251.5***	504.9*
RH@3PM	443.9***	1822.1	205.6**	159.3*	537.2	307.4*
RH@9AM	80.4	17929.4***	1822.6***	200.4*	1946.6	314.5*
Sol. Rad.	373.0***	231.0	168.4*	30.5	3488.8*	62.9
T2M	12.7	4644.6*	1248.2***	0.2	4161.3*	46.4
T2MMax	75.5	9415.3***	83.6	41.5	45.7	787.0**
T2MMin	21.2	192.0	89.2	0.1	443.5	518.3*
T2MRNG	6.7	27.1	0.5	44.2	1.0	254.0
TS	5.8	71.2	22.2	2.9	1038.4	110.6
Bunch size	51.2	3058.5**	210.9***	71.1	1375.3	47.3
MaxT.Bunch size	18.0	945.2	91.4*	71.7	6028.9***	366.9**
MinT.Bunch size	29.1	1511.9	126.7**	63.2	3970.3***	190.9*
RF.Bunch size	20.3	558.1	176.1***	35.1	6125.8***	231.5*
RH2M.Bunch size	54.2	10705.7***	150.4**	78.1	2612.4*	216.6*
RH@3PM.Bunch size	73.5*	1767.0	336.9***	15.1	471.2	124.4
RH@9AM.Bunch size	79.4*	5284.5**	63.9	62.0	4667.1**	42.1
Sol. Rad.Bunch size	41.9	830.5	177.6**	34.3	4567.2**	144.2
T2M.Bunch size	24.5	6712.2***	695.6***	31.2	3081.0*	52.9
T2MMax.Bunch size	47.4	228.0	261.7***	44.3	999.9	143.5
T2MMin.Bunch size	20.5	168.4	245.7***	27.6	265.9	317.9**
T2MRNG.Bunch size	24.1	728.3	50.5	0.3	88.0	831.8***
TS.Bunch size	1.9	83.7	73.3	42.7	786.1	64.8
Residual	28.2	670.0	27.1	29.2	613.8	69.9

*P<0.05, **P<0.01, ***P<0.001, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, RF – Rainfall, RH2M – Relative humidity at 2 meters, RH@3pm – Relative humidity at 3pm, RH@9am – Relative humidity at 9am, Sol. Rad. – Solar radiation, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, T2M – Average temperature at 2 meters, TS – Earth skin temperature, and DBP – days before pollination

Table S10. Accumulated analysis of variance mean squares of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes 15 before pollination and zero days after pollination (time of pollination) for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Change	15 DBP			0 DAP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
T@3PM	228.0**	31081.1***	4428.7***	238.3**	20.0	2.6
T@9AM	78.7	798.5	61.1	116.0*	2499.3	26.9
RF	29.3	4438.9*	11.8	12.2	3921.3*	764.4***
RH2M	6.9	6497.4**	725.1*	46.3	3135.2*	237.7*
RH@3PM	245.2**	978.0	104.8*	152.0*	1631.2	50.4
RH@9AM	31.4	2103.4	40.1	12.5	7149.5**	23.8
Sol. Rad.	0.0	8331.7***	1049.3***	18.9	3645.3*	1895.1***
T2M	61.7	3863.4*	25.0	7.9	740.0	429.8**
T2MMax	32.1	7820.2***	3.9	0.2	75.8	15.1
T2MMin	59.9	464.5	929.5***	7.2	272.1	35.6
T2MRNG	1.5	2982.0*	0.4	30.9	1542.2	627.3**
TS	2.9	1143.2	65.5	7.4	24162.6***	1680.0***
Bunch size	65.7	2563.9**	193.5***	63.9*	3451.4***	300.0***
H2M.Bunch size	44.6	2566.1*	371.7***	98.9**	966.1	55.7
MaxT.Bunch size	33.7	4701.1***	245.5***	167.4***	1178.5	45.6
MinT.Bunch size	42.4	22.1	41.4	83.2*	239.8	370.3***
RF.Bunch size	121.3**	1709.8	81.5**	35.1	559.3	151.9*
RH@3PM.Bunch size	46.2	622.8	245.5***	33.0	1522.4	131.4
RH@9AM.Bunch size	23.7	6379.8***	474.8***	92.3*	687.8	6.4
Sol. Rad.Bunch size	32.9	620.9	338.3***	18.0	1617.1	998.7***
T2M.Bunch size	18.7	132.0	60.6*	14.6	18273.1***	7.1
T2MMax.Bunch size	6.9	113.3	108.5**	36.5	1231.0	211.3*
T2MMin.Bunch size	13.2	235.9	178.8***	33.0	1947.6	104.5
T2MRNG.Bunch size	18.4	70.4	157.6***	2.7	7.3	162.5*
TS.Bunch size	0.3	138.1	297.3***	2.8	204.3	368.1**
Residual	31.2	613.2	17.8	25.5	699.2	54.9

*P<0.05, **P<0.01, ***P<0.001, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, RF – Rainfall, RH2M – Relative humidity at 2 meters, RH@3pm – Relative humidity at 3pm, RH@9am – Relative humidity at 9am, Sol. Rad. – Solar radiation, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, T2M – Average temperature at 2 meters, TS – Earth skin temperature, DBP – days before pollination, and DAP – days after pollination

Table S11. Accumulated analysis of variance mean squares of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes 15 and 30 days after pollination for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Change	15 DAP			30 DAP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
T@3PM	43.2	451.8	678.2**	2.9	20.2	495.5**
T@9AM	82.2	7699.2**	573.3**	139.6*	24241.1***	2311.9***
RF	15.2	28.3	0.0	96.5	3811.8*	9.4
RH2M	0.2	766.0	83.2	68.0	7.7	5.7
RH@3PM	129.4*	1256.6	345.6*	313.4**	377.1	444.0**
RH@9AM	20.9	938.1	1564.2***	60.3	1.1	240.9
Sol. Rad.	2.1	2296.8	1254.9***	52.3	1717.0	163.5
T2M	206.2*	2247.5	463.7**	53.9	1953.8	268.3*
T2MMax	0.9	246.5	153.9	0.8	26.3	156.6
T2MMin	18.2	2631.8	210.3	145.3*	827.4	139.4
T2MRNG	5.8	6663.3**	208.3	9.2	210.6	1849.3***
TS	0.1	2400.3	676.2**	4.9	1013.5	221.0
Bunch size	79.4*	4101.0***	322.7***	62.6	5094.7***	192.5*
MaxT.Bunch size	53.9	944.9	158.4*	9.6	1933.1*	141.5*
MinT.Bunch size	103.3*	1818.7	138.7*	81.5*	9023.6***	106.4
RF.Bunch size	32.3	4716.4**	48.8	31.1	5239.1***	53.2
RH2M.Bunch size	16.8	19037.5***	8.7	13.1	299.7	40.5
RH@3PM.Bunch size	27.1	829.8	141.2*	22.2	1702.5	284.1**
RH@9AM.Bunch size	21.6	1399.3	154.8*	20.8	9781.3***	52.4
Sol. Rad.Bunch size	2.8	1197.9	96.6	17.1	2580.1*	939.6***
T2M.Bunch size	71.2	395.2	416.7***	65.8	436.3	41.9
T2MMax.Bunch size	29.3	574.4	167.2*	55.9	58.2	169.3*
T2MMin.Bunch size	72.5	483.5	130.3	52.9	14.1	432.5***
T2MRNG.Bunch size	20.6	4161.4*	162.1*	20.3	540.8	152.7
TS.Bunch size	10.6	929.0	924.4***	11.2	138.9	351.9**
Residual	31.9	806.7	52.6	31.0	624.5	58.2

*P<0.05, **P<0.01, ***P<0.001, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, RF – Rainfall, RH2M – Relative humidity at 2 meters, RH@3pm – Relative humidity at 3pm, RH@9am – Relative humidity at 9am, Sol. Rad. – Solar radiation, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, T2M – Average temperature at 2 meters, TS – Earth skin temperature, and DAP – days after pollination

Table S12. Accumulated analysis of variance mean squares of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes 45 and 60 days after pollination for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Change	45 DAP			60 DAP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
T@3PM	2.9	1087.0	85.7	4.0	3104.0*	652.7**
T@9AM	269.3**	7955.3***	1928.6***	211.0**	2615.2	2493.5***
RF	15.4	10655.1***	481.0**	7.8	1538.1	8.8
RH2M	24.3	1219.4	47.5	2.8	757.3	823.9***
RH@3PM	168.5*	4209.0**	843.7***	85.9	7914.3**	28.1
RH@9AM	16.6	6570.5**	11.2	7.4	694.5	815.5***
Sol. Rad.	26.9	1855.2	1383.6***	1.1	6730.8**	760.1***
T2MMax	18.1	82.1	113.1	44.1	1192.5	62.7
T2MMin	7.3	70.1	45.3	176.8*	83.1	193.5
T2MN	14.1	557.1	94.7	0.4	443.1	19.2
T2MRNG	49.9	3230.6*	130.2	0.3	937.0	615.9**
TS	82.0	5044.8**	118.9	197.2*	6747.4**	56.1
Bunch size	66.3	3697.0***	201.5**	76.3*	4344.7***	168.9*
T@3PM.Bunch size	3.4	8341.7***	75.5	123.6**	6330.5***	22.7
T@9AM.Bunch size	152.2***	756.8	27.9	81.5*	3200.4*	38.3
RF.Bunch size	31.9	15282.0***	192.1*	21.9	11784.2***	71.7
RH2M.Bunch size	26.7	2757.4*	10.8	27.0	1818.5	108.5
RH@3PM.Bunch size	7.5	500.8	20.5	4.9	706.4	1831.1***
RH@9AM.Bunch size	53.9	18.0	81.6	16.0	4119.8**	153.2
Sol. Rad.Bunch size	91.1*	921.1	82.5	7.9	1361.2	63.1
T2MMax.Bunch size	5.5	2195.8*	140.6	90.2*	2644.6*	270.4**
T2MMin.Bunch size	21.4	891.7	841.3***	50.3	1185.2	189.1*
T2MN.Bunch size	25.7	1306.2	249.5*	25.4	134.8	49.7
T2MRNG.Bunch size	26.5	661.5	604.0***	2.1	249.9	27.4
TS.Bunch size	12.2	1222.7	824.6***	61.8	1244.4	30.0
Residual	30.4	562.6	58.0	28.4	649.3	58.1

*P<0.05, **P<0.01, ***P<0.001, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, RF – Rainfall, RH2M – Relative humidity at 2 meters, RH@3pm – Relative humidity at 3pm, RH@9am – Relative humidity at 9am, Sol. Rad. – Solar radiation, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, T2M – Average temperature at 2 meters, TS – Earth skin temperature, and DAP – days after pollination

Table S13. Accumulated analysis of variance mean squares of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes 75 and 90 days after pollination for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Change	75 DAP			90 DAP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
T@3PM	26.9	521.3	19.3	22.1	10.2	8.8
T@9AM	179.9*	15357.6***	1761.4***	139.7	121.3	482.9***
RF	10.3	2830.8	477.9**	56.7	6397.1**	68.2
RH2M	32.7	639.6	870.4***	8.1	1951.1	530.5***
RH@3PM	64.8	8452.5**	36.6	186.2*	586.1	0.3
RH@9AM	0.1	966.2	33.9	10.6	1698.7	273.8*
Sol. Rad.	52.6	7233.8**	1997.4***	19.2	685.0	1848.6***
T2MMax	7.5	6116.9**	51.7	188.5*	1406.4	68.5
T2MMin	29.9	828.4	5.6	27.5	7468.3***	201.4*
T2MN	114.9	18.8	467.0**	5.3	22.7	7.6
T2MRNG	32.9	1181.7	2.9	18.5	7177.7***	25.1
TS	0.1	922.6	228.7	0.2	12755.3***	2518.2***
Bunch size	74.8*	2669.3**	229.2**	55.8	3303.1***	171.4***
T@3PM.Bunch size	12.2	5597.9**	38.9	94.7*	1275.8	219.3**
T@9AM.Bunch size	87.2*	3326.7*	134.4	35.8	8570.7***	83.4
RF.Bunch size	10.7	3872.4**	86.3	43.2	11968.8***	577.7***
RH2M.Bunch size	85.4*	5386.4**	322.2**	26.8	152.9	96.5
RH@3PM.Bunch size	29.3	1945.1	280.9**	62.3	868.9	49.5
RH@9AM.Bunch size	40.6	6910.5***	204.4*	37.3	8172.5***	50.6
Sol. Rad.Bunch size	66.5	741.4	22.0	83.5*	503.3	68.8
T2MMax.Bunch size	16.1	653.0	72.3	28.0	3627.5**	100.3
T2MMin.Bunch size	6.3	1391.6	472.0***	4.5	938.5	214.2**
T2MN.Bunch size	95.7*	716.7	110.2	4.3	43.9	31.2
T2MRNG.Bunch size	45.4	66.0	345.6**	37.9	198.1	1586.4***
TS.Bunch size	23.8	1803.0	721.9***	0.3	820.8	160.8*
Residual	30.3	710.5	58.6	30.4	550.4	35.9

*P<0.05, **P<0.01, ***P<0.001, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, RF – Rainfall, RH2M – Relative humidity at 2 meters, RH@3pm – Relative humidity at 3pm, RH@9am – Relative humidity at 9am, Sol. Rad. – Solar radiation, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, T2M – Average temperature at 2 meters, TS – Earth skin temperature, and DAP – days after pollination

Table S14. Accumulated analysis of variance mean squares of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes 105 and 120 days after pollination for ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Change	105 DAP		120 DAP	
	‘Mshale’	‘Nshonowa’	‘Mshale’	‘Nshonowa’
T@3PM	3,519.0*	326.1	4,522.8**	103.8
T@9AM	4,957.0**	477.7	4,181.3*	1,073.2**
RF	1,331.3	623.0	1,060.6	63.4
RH2M	4,299.3**	186.2	4,440.6**	126.7
RH@3PM	965.6	443.4	9.5	15.9
RH@9AM	1,121.5	222.6	7,964.1***	22.0
Sol. Rad.	4,207.9**	697.9*	5,243.5**	2,339.8***
T2MMax	14,486.0***	2,135.0***	362.9	118.6
T2MMin	1,056.9	10.2	499.2	209.1
T2MN	848.5	108.5	10,094.2***	340.4
T2MRNG	2,063.4*	205.7	2,124.5	25.0
TS	13,272.5***	699.7*	13,325.6***	506.4*
Bunch size	4,094.8***	124.2	3,201.4***	103.7
T@3PM.Bunch size	2,040.7*	58.0	1,457.0	46.4
T@9AM.Bunch size	4,086.6***	114.5	1,452.5	61.1
RF.Bunch size	553.0	230.8	888.3	66.5
RH2M.Bunch size	8,177.0***	37.7	16,004.6***	52.2
RH@3PM.Bunch size	1,947.8*	195.3	269.0	157.6
RH@9AM.Bunch size	5,620.9***	69.5	5,088.5***	115.2
Sol. Rad.Bunch size	1,508.0*	112.6	3,494.8**	139.0
T2MMax.Bunch size	4,300.4***	822.1**	151.6	201.2
T2MMin.Bunch size	349.9	38.9	57.1	112.5
T2MN.Bunch size	1,606.1	54.1	134.2	1,081.4***
T2MRNG.Bunch size	23.6	208.7	56.1	245.8
TS.Bunch size	16.0	138.3	1.3	883.1***
Residual	483.4	156.8	577.6	98.8

*P<0.05, **P<0.01, ***P<0.001, T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, RF – Rainfall, RH2M – Relative humidity at 2 meters, RH@3pm – Relative humidity at 3pm, RH@9am – Relative humidity at 9am, Sol. Rad. – Solar radiation, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, T2M – Average temperature at 2 meters, TS – Earth skin temperature, and DAP – days after pollination

Table S15. Accumulated analysis of variance degrees of freedom of a multiple linear regression with bunch size as groups of seed set adjusted to 100 fruits per bunch regressed on weather attributes 105 days before pollination and 120 days after pollination at 15 day intervals for ‘Enzirabahima,’ ‘Mshale’ and ‘Nshonowa’ pollinated with ‘Calcutta 4’ between January 2016 and January 2019

Change	105 DBP – 75 DAP			90 – 120 DAP		
	‘Enzirabahima’	‘Mshale’	‘Nshonowa’	‘Enzirabahima’	‘Mshale’	‘Nshonowa’
T@3PM	1	1	1	1	1	1
T@9AM	1	1	1	1	1	1
RF	1	1	1	1	1	1
RH2M	1	1	1	1	1	1
RH@3PM	1	1	1	1	1	1
RH@9AM	1	1	1	1	1	1
Sol. Rad.	1	1	1	1	1	1
T2MMax	1	1	1	1	1	1
T2MMin	1	1	1	1	1	1
T2MRNG	1	1	1	1	1	1
T2M	1	1	1	1	1	1
TS	1	1	1	1	1	1
Bunch size	4	5	6	4	5	6
T@3PM.Bunch size	4	2	5	4	2	4
T@9AM.Bunch size	4	2	5	3	2	3
RF.Bunch size	4	2	4	3	2	3
RH2M.Bunch size	4	2	4	4	2	4
RH@3PM.Bunch size	3	2	3	4	4	6
RH@9AM.Bunch size	3	2	3	4	2	5
Sol. Rad.Bunch size	4	4	6	4	2	4
T2MMax.Bunch size	3	2	3	3	2	3
T2MMin.Bunch size	3	1	3	3	2	3
T2MRNG.Bunch size	3	1	3	2	1	3
T2M.Bunch size	3	2	3	3	1	3
TS.Bunch size	2	1	3	2	1	3
Residual	114	49	35	100	40	29

T@3pm – Temperature at 3pm, T@9am – Temperature at 9am, RF – Rainfall, RH2M – Relative humidity at 2 meters, RH@3pm – Relative humidity at 3pm, RH@9am – Relative humidity at 9am, Sol. Rad. – Solar radiation, T2MMax – Maximum temperature at 2 meters, T2MMin – Minimum temperature at 2 meters, T2MRNG – Temperature range at 2 meters, T2M – Average temperature at 2 meters, TS – Earth skin temperature, and DAP – days after pollination