Supplementary Materials

Table S1: Description of the test locations used for evaluation of genotypes under fall armyworm infested and non-infested growing conditions in Nigeria in 2021

Location	Agro-ecological zone	Longitude	Latitude	Altitude (masl)	Treatment
University of Ibadan, Ibadan, Oyo State	FST	3°53'E	7°27'N	206	Artificial fall armyworm infestation vs. protected conditions
Farm Forte, Benin City, Edo State	RF	5°52'E	10°14'N	280	Natural armyworm infestation vs. protected conditions
Ndayako Village, Mokwa, Niger State	SGS	7°35'E	9°35'N	457	Natural armyworm infestation vs. protected conditions
College of Agriculture, Lafia, Nassarawa State	SGS	8°25'E	8°29'N	383	Natural armyworm infestation vs. protected conditions
Value Seeds Limited, Bagaddi, Zaria, Kaduna State	NGS	7°48'E	11°13'N	681	Natural armyworm infestation vs. protected conditions
Federal University Dustin-Ma, Katsina State	NGS	7°49'E	12°47'N	598	Natural armyworm infestation vs. protected conditions

SGS, southern Guinea savanna; NGS, northern Guinea savanna; FST, Forest-Savanna transition zone; RF, Rain Forest.

Table S2: Mean squares from the ANOVA for grain yield and agronomic traits of maize hybrids evaluated under artificial, natural FAW-infestations and protected environments, and fall armyworm resistant traits in infested environments in Nigeria

Source	DF	Grain yield	Days to anthesis	Days to silking	Anthesis-silking interval	Plant height	Plant aspect	Husk cover	Ear aspect	DF	Leaf damage	Ear damage
TREATMENT (TRT)	2	60596547***	142.76***	55.28***	30.65***	1046.12	51.49***	34.19***	34.59***	1	596.45***	154.92***
REP(TRT)	5	5665732**	11.05	6.69	1.19	617.26	1.81	0.63	2.75	4	17.22***	3.50*
ENTRY	21	3634462*	80.28***	84.40***	1.79	2275.56***	1.44*	1.89	1.31	21	2.73*	3.33***
TRT*ENTRY	41	1620731	8.17	9.82*	2.02**	518.79	0.93	1.86***	1.05	21	2.41*	3.47***
ERROR	622	1720321.00	6.16	6.43	1.13	162.66	0.81	0.60	0.89	414	1.31	1.07

*, **, ***: $p \leq 0.05$, 0.01, and 0.001

Table S3: Mean performance of grain yield, agronomic and fall armyworm (FAW) resistance traits of maize hybrids evaluated under artificial FAW infestation in two growing seasons at Ibadan, Nigeria

GENOTYPE	Grain yield (Kg/ha)	Days to anthesis	Days to silking	Anthesis-silking interval	Plant height (cm)	Plant aspect (1-5)	Husk cover (1-5)	Ear aspect (1-5)	Leaf damage (1-5)	Ear damage (1-5)
AWR SYN-W2 x 1393	5813.3	56.0	57.3	1.3	171.9	3.0	2.9	2.6	4.2	3.4
AWR SYN-W2 x CML 331	4776.7	57.9	60.8	2.9	148.8	2.7	3.0	3.6	5.9	4.9
AWR SYN-W2 x CKSBL10060	4685.0	53.7	56.7	3.0	158.5	3.0	3.6	3.3	4.9	4.6
AMATZBR-WC4 x 1393	5463.3	57.0	60.0	3.0	172.7	2.9	4.1	3.0	4.3	3.3
AMATZBR-WC4 x CML 331	4100.0	56.6	60.6	4.0	134.2	3.0	3.3	3.4	6.2	4.7
AMATZBR-WC4 x CKSBL10060	5133.3	54.8	57.9	3.1	177.4	2.4	3.5	2.4	5.9	3.0
TZBR Eld 4-WC2 x 1393	4688.3	57.6	59.8	2.2	167.0	2.9	2.6	3.0	4.3	3.6
TZBR Eld 4-WC2 x CML 331	3441.7	59.3	62.6	3.4	133.8	3.0	3.6	3.6	6.2	4.1
TZBR Eld 4-WC2 x CKSBL10060	4428.3	55.2	57.4	2.2	169.2	3.1	3.4	3.7	5.6	4.4
TZB-SR x 1393	5281.7	55.2	57.5	2.3	166.4	3.4	4.0	2.7	4.6	3.4
TZB-SR x CML 331	4090.0	58.3	61.4	3.2	149.8	3.4	3.3	3.4	5.8	4.1
TZB-SR x CKSBL10060	5106.7	55.6	57.6	2.0	185.1	3.0	3.4	3.0	5.1	3.0
TZBR Comp 1-WC2 x 1393	5483.3	57.4	58.6	1.3	181.9	2.9	4.0	2.4	4.0	3.0
TZBR Comp 1-WC2 x CML 331	3751.7	57.1	59.4	2.3	142.7	2.6	3.5	3.9	5.8	5.3
TZBR Comp 1-WC2 x CKSBL10060	4428.3	54.4	57.3	2.9	166.2	2.6	3.7	3.7	4.7	5.7
TZBR Comp 2-WC2 x 1393	4681.7	59.0	60.9	1.9	180.3	3.5	3.7	2.7	4.8	4.4
TZBR Comp 2-WC2 x CML 331	4448.3	57.3	60.0	2.7	156.4	2.7	3.6	3.7	5.3	4.7
TZBR Comp 2-WC2 x CKSBL10060	4896.7	56.1	58.3	2.2	176.8	2.6	3.4	2.9	4.8	3.5
1393 x CML 331	4071.7	60.5	63.7	3.2	138.6	3.0	4.0	3.4	5.2	4.5

1393 x CKSBL10060	4221.7	53.7	55.5	1.7	147.3	3.4	2.9	3.4	5.5	4.1
SAMMAZ 22	5090.0	60.0	63.2	3.2	161.7	2.6	3.6	3.4	5.4	3.0
TZBR Comp 1-WC2 x TZBR Comp 2-WC2	4456.7	58.4	60.1	1.7	173.0	3.6	3.6	3.4	4.5	3.7
Mean	4661.0	56.9	59.4	2.5	161.8	3.0	3.5	3.2	5.1	4.0
LSD (0.05)	617.8	1.1	1.4	1.1	9.9	0.6	0.6	0.6	1.0	0.7
CV (%)	11.5	1.7	2.0	39.3	5.3	16.6	15.1	17.3	17.1	15.8

LSD: Least significant difference, CV: Coefficient of variation

Table S4: Mean performance of grain yield, agronomic and fall armyworm (FAW) resistance traits of maize hybrids evaluated under natural FAW infestation across five locations in Nigeria

GENOTYPE	Grain yield (Kg/ha)	Days to anthesis	Days to silking	Anthesis-silking interval	Plant height (cm)	Plant aspect (1-5)	Husk cover (1-5)	Ear aspect (1-5)	Leaf damage (1-5)	Ear damage (1-5)
AWR SYN-W2 x 1393	3670.1	58.9	60.3	1.5	170.8	3.7	2.7	4.1	2.4	3.3
AWR SYN-W2 x CML 331	3910.5	59.4	61.1	1.7	161.3	4.1	2.9	4.0	3.4	3.1
AWR SYN-W2 x CKSBL10060	4008.6	54.8	56.6	1.8	159.6	3.9	2.7	4.0	3.0	2.8
AMATZBR-WC4 x 1393	4095.0	57.7	59.3	1.6	161.8	3.8	2.3	3.7	3.3	2.5
AMATZBR-WC4 x CML 331	4030.7	61.3	62.2	1.1	163.9	4.2	3.9	4.0	2.1	1.7
AMATZBR-WC4 x CKSBL10060	4483.7	57.9	59.2	1.3	165.6	3.5	1.9	3.9	3.8	2.3
TZBR Eld 4-WC2 x 1393	3923.5	58.0	60.0	2.0	159.5	3.7	2.3	4.0	2.6	2.6
TZBR Eld 4-WC2 x CML 331	3192.1	60.0	62.0	2.0	153.3	3.7	2.2	4.1	2.9	3.1
TZBR Eld 4-WC2 x CKSBL10060	5058.4	57.3	59.3	2.0	160.3	3.8	2.7	4.0	2.9	2.9
TZB-SR x 1393	3479.3	58.8	60.4	1.6	174.2	4.1	2.4	3.8	3.1	2.7
TZB-SR x CML 331	4201.2	60.2	61.5	1.3	155.1	4.6	3.1	4.1	3.6	2.4
TZB-SR x CKSBL10060	4701.8	54.9	56.8	1.9	170.1	3.7	2.5	4.1	2.5	3.0
TZBR Comp 1-WC2 x 1393	4518.5	59.7	61.1	1.3	167.5	3.9	2.5	3.6	2.2	2.3
TZBR Comp 1-WC2 x CML 331	3764.9	59.6	61.5	1.9	151.3	3.9	3.0	3.9	3.1	2.7
TZBR Comp 1-WC2 x CKSBL10060	3955.8	55.1	56.8	1.7	167.9	3.6	2.9	3.3	2.5	2.8
TZBR Comp 2-WC2 x 1393	3597.8	60.1	61.9	1.9	161.8	3.7	2.1	4.1	3.4	3.3
TZBR Comp 2-WC2 x CML 331	3786.1	59.9	61.8	1.9	143.6	4.3	3.0	4.2	2.5	2.3
TZBR Comp 2-WC2 x CKSBL10060	3900.6	58.5	60.4	1.9	167.1	3.3	2.3	3.6	2.9	2.8
1393 x CML 331	3389.7	59.8	61.7	1.9	155.3	4.6	2.7	4.5	3.0	3.1
1393 x CKSBL10060	3450.5	55.1	57.1	2.0	160.5	3.9	2.8	4.5	2.5	2.2
SAMMAZ 22	3322.4	60.0	61.6	1.6	160.2	4.5	2.9	4.1	2.9	3.0
TZBR Comp 1-WC2 x TZBR Comp 2-WC2	3574.0	60.1	62.1	2.0	163.0	4.2	2.9	3.9	3.2	3.3
Mean	3909.8	58.5	60.2	1.7	161.5	4.0	2.7	4.0	2.9	2.7
LSD (0.05)	807.1	1.4	1.4	0.6	15.3	0.6	0.4	0.6	0.7	0.7
CV (%)	28.7	3.3	3.3	51.8	13.1	22.3	21.4	19.7	32.8	35.6

LSD: Least significant difference, CV: Coefficient of variation

Table S5: Mean performance of grain yield and agronomic traits of maize hybrids evaluated under insecticide protection across seven environments in Nigeria

GENOTYPE	Grain yield (Kg/ha)	Days to anthesis	Days to silking	Anthesis-silking interval	Plant height (cm)	Plant aspect (1-5)	Husk cover (1-5)	Ear aspect (1-5)
AWR SYN-W2 x 1393	5471.0	57.4	59.5	2.1	177.3	3.2	2.8	3.1
AWR SYN-W2 x CML 331	4453.3	57.5	59.7	2.2	155.1	3.5	3.5	3.7
AWR SYN-W2 x CKSBL10060	4943.1	54.1	56.2	2.1	165.7	3.3	3.0	3.6
AMATZBR-WC4 x 1393	4853.9	57.9	59.6	1.8	177.1	3.7	3.0	3.4
AMATZBR-WC4 x CML 331	4784.9	60.6	62.4	1.8	158.0	3.1	2.5	3.7
AMATZBR-WC4 x CKSBL10060	4865.2	57.3	59.2	1.9	166.1	2.3	2.0	3.2
TZBR Eld 4-WC2 x 1393	4617.3	58.7	60.8	2.1	168.1	3.1	3.1	3.4
TZBR Eld 4-WC2 x CML 331	4800.5	58.6	60.4	1.8	155.8	3.6	3.0	3.7
TZBR Eld 4-WC2 x CKSBL10060	5267.9	55.8	57.6	1.8	169.6	3.2	3.3	3.2
TZB-SR x 1393	4469.9	57.1	59.2	2.1	174.3	3.5	2.7	3.6
TZB-SR x CML 331	4436.2	58.7	60.6	1.9	164.4	3.2	2.3	2.9
TZB-SR x CKSBL10060	5515.9	54.1	55.7	1.6	178.0	3.0	2.9	3.2
TZBR Comp 1-WC2 x 1393	5253.8	58.0	59.4	1.4	165.9	3.4	3.2	3.5
TZBR Comp 1-WC2 x CML 331	4873.1	58.8	61.1	2.3	159.8	3.4	3.6	3.6
TZBR Comp 1-WC2 x CKSBL10060	4746.6	56.1	57.8	1.6	161.3	3.8	3.5	3.7
TZBR Comp 2-WC2 x 1393	4954.3	59.3	61.5	2.2	166.5	3.6	3.2	3.8
TZBR Comp 2-WC2 x CML 331	4968.5	59.5	61.7	2.2	159.0	3.4	3.8	3.7
TZBR Comp 2-WC2 x CKSBL10060	5696.5	56.8	58.2	1.4	176.9	3.7	3.2	3.0
1393 x CML 331	4454.9	57.2	58.9	1.7	155.3	3.8	3.2	3.7
1393 x CKSBL10060	4856.4	55.2	57.3	2.2	157.6	3.6	2.9	3.4
SAMMAZ 22	4252.1	59.0	61.0	2.0	156.5	3.5	3.1	3.5
TZBR Comp 1-WC2 x TZBR Comp 2-WC2	5016.6	57.5	59.4	2.0	173.6	3.4	3.1	3.7
Mean	4888.7	57.5	59.4	1.9	165.5	3.4	3.0	3.5
LSD	597.3	1.3	1.3	0.7	8.9	0.4	0.4	0.4
CV (%)	20.1	3.7	3.6	56.9	8.8	18.1	21.7	20.6

LSD: Least significant difference, CV: Coefficient of variation