

Table S1 Average values of leaf traits and photosynthetic characteristics for different hybrid clones of different ploidies

Clone/Ploidy	LL	LW	LA	LSI	Pn	Gs	Ci	Tr	WUE
BCXH	125.87±7.31	139.11±4.19	123.4±5.08	0.91±0.06	18.91±0.79	0.49±0.07	296.44±12.86	5.29±0.43	3.60±0.39
HB3.1	129.62±1.91	161.29±1.71	147.00±2.83	0.80±0.02	20.27±1.53	0.37±0.07	265.56±19.60	4.79±0.56	4.29±0.62
HB4.1	117.67±1.52	145.71±2.30	124.90±2.30	0.81±0.01	19.06±1.15	0.30±0.05	253.67±12.23	3.81±0.48	5.04±0.39
HY3.1	118.21±1.57	152.15±3.14	134.90±2.13	0.78±0.02	19.30±1.03	0.48±0.07	292.67±5.98	5.30±0.24	3.64±0.07
HY3.3	135.71±1.83	179.04±2.13	169.60±3.21	0.76±0.01	19.09±0.83	0.31±0.05	255.78±18.25	4.06±0.45	4.76±0.54
SX3.1	140.37±2.82	138.05±2.32	156.10±4.29	1.02±0.03	20.73±1.36	0.40±0.11	267.00±29.80	3.95±0.77	5.45±1.21
SX3.2	130.86±3.91	155.99±4.01	160.04±2.90	0.84±0.01	19.34±1.18	0.55±0.07	301.89±3.18	5.34±0.40	3.62±0.11
SX3.3	129.35±2.38	155.95±3.79	151.80±4.27	0.83±0.01	22.22±0.29	0.48±0.05	278.22±8.60	5.72±0.43	3.91±0.34
SY3.1	148.44±3.10	160.74±2.05	171.60±6.19	0.92±0.02	19.81±1.84	0.46±0.08	288.11±11.81	3.93±0.44	5.08±0.56
SY3.2	131.57±2.97	181.79±4.58	161.80±4.66	0.72±0.02	16.17±0.53	0.32±0.03	282.56±9.59	4.15±0.24	3.91±0.30
XH	131.51±2.94	140.34±4.64	127.20±6.61	0.94±0.02	19.71±1.16	0.49±0.03	292.89±5.49	5.39±0.20	3.66±0.24
XH14	123.97±3.29	137.54±3.33	120.40±4.62	0.90±0.03	18.51±2.22	0.35±0.11	270.78±15.12	3.53±0.74	5.34±0.64
XY3.1	108.87±3.07	121.41±4.27	91.40±5.41	0.90±0.05	18.51±2.22	0.35±0.11	270.78±15.12	3.53±0.74	5.34±0.64
XY3.4	128.23±2.75	138.54±3.76	108.60±3.91	0.93±0.02	20.77±1.27	0.43±0.02	279.11±8.92	4.46±0.09	4.66±0.34
XY3.5	121.43±3.04	129.70±3.76	97.20±3.96	0.94±0.02	18.93±2.15	0.40±0.10	280.44±13.21	4.02±0.72	4.78±0.57
XY3.6	120.74±3.61	138.80±2.24	123.63±5.40	0.87±0.03	18.79±0.43	0.38±0.03	280.78±8.01	4.60±0.21	4.09±0.27
XY3.7	117.19±3.55	128.89±2.45	104.40±6.07	0.91±0.02	18.12±0.94	0.29±0.06	255.67±17.71	3.43±0.54	5.37±0.64
XY4.1	111.05±3.19	142.18±3.34	122.35±4.70	0.78±0.04	18.74±0.35	0.41±0.06	284.00±13.83	4.86±0.46	3.90±0.44
XY4.2	142.45±4.48	161.06±6.82	155.20±4.76	0.89±0.02	18.59±0.33	0.40±0.03	284.89±5.30	5.06±0.18	3.68±0.13
Control	127.11±5.64	139.00±3.97	123.67±5.85	0.91±0.04	19.04±1.55	0.44±0.1	286.70±16.26	4.74±1.00	4.20±0.93
Triploid	127.74±10.52	149.41±18.44	136.77±27.96	0.86±0.08	19.39±1.91	0.40±0.1	276.81±19.16	4.41±0.83	4.53±0.83
Tetraploid	123.72±14.32	149.65±9.49	134.15±15.90	0.82±0.05	18.80±0.72	0.37±0.07	274.19±18.23	4.57±0.67	4.21±0.70

Note: (Pn): net photosynthesis rate; (Ci): intercellular CO<sub>2</sub> concentration; (Gs): stomatal conductance; (Tr): transpiration rate; (WUE): water use efficiency; (LL): leaf length; (LW): leaf weight; (LA): leaf area; (LSI): leaf shape index.

Table S2 Average values of growth traits for different hybrid clones of different ploidies

Clone/Ploidy	H1	BD1	H2	BD2	H3	BD3	DBH3	V3	H4	BD4	DBH4	V4
BCXH	2.17±0.31	17.63±2.95	3.93±0.45	46.66±8.05	5.57±0.90	83.02±21.56	49.48±13.08	0.006±0.004	7.34±1.01	105.00±21.58	71.22±17.07	0.016±0.010
HB3.1	1.80±0.19	16.45±2.28	2.95±0.14	30.88±3.97	4.74±0.34	54.25±7.25	33.6±4.47	0.002±0.001	7.31±0.45	67.22±9.48	44.44±4.85	0.006±0.002
HB4.1	1.89±0.19	15.34±1.92	3.25±0.34	37.37±3.98	4.90±0.27	57.68±7.11	36.74±6.15	0.003±0.001	6.18±0.27	73.22±9.48	50.33±6.14	0.006±0.002
HY3.1	2.07±0.17	16.05±1.73	4.00±0.26	42.72±4.99	5.70±0.38	77.01±8.31	48.21±3.70	0.005±0.001	6.69±0.33	98.78±9.01	61.22±4.71	0.010±0.002
HY3.3	2.07±0.15	19.01±1.48	3.98±0.32	54.06±8.76	5.60±0.44	77.61±1.61	49.36±4.78	0.005±0.001	7.88±0.72	97.33±3.24	65.67±5.27	0.013±0.003
SX3.1	2.25±0.15	19.75±2.31	4.63±0.31	55.53±4.45	6.88±0.26	94.54±14.59	64.87±7.51	0.011±0.003	9.00±0.35	134.11±14.04	94.22±8.30	0.030±0.006
SX3.2	2.09±0.21	17.94±2.09	4.07±0.26	48.11±5.25	5.54±0.69	74.06±9.47	45.67±9.01	0.005±0.002	6.96±0.77	91.00±12.30	63.67±9.51	0.011±0.004
SX3.3	2.07±0.13	18.28±1.63	4.22±0.26	50.92±2.66	6.20±0.63	82.96±11.57	55.16±7.96	0.008±0.003	7.77±0.87	101.56±12.52	71.33±12.85	0.016±0.007
SY3.1	2.16±0.24	20.27±3.27	4.47±0.40	55.18±10.39	6.04±0.54	80.94±17.02	51.34±12.44	0.007±0.003	7.90±0.83	109.67±15.39	77.67±14.32	0.019±0.009
SY3.2	2.46±0.21	19.61±2.26	4.37±0.27	51.10±3.99	5.70±0.32	81.78±6.33	49.2±7.28	0.005±0.002	6.96±0.29	101.89±5.25	66.22±9.42	0.012±0.004
XH	2.06±0.15	16.34±1.77	4.27±0.17	49.35±3.70	6.03±0.5	79.27±12.81	53.04±9.95	0.007±0.003	7.76±0.78	101.89±17.11	69.00±12.02	0.015±0.006
XH14	2.06±0.08	17.00±1.26	4.01±0.45	43.95±6.86	6.10±0.79	80.92±14.48	52.59±9.91	0.007±0.003	7.94±0.49	107.11±13.31	69.44±10.03	0.015±0.005
XY3.1	1.96±0.10	15.12±0.62	4.25±0.40	42.78±4.86	6.34±0.61	70.46±9.61	51.06±7.56	0.007±0.002	8.54±0.50	93.67±17.49	74.11±14.00	0.019±0.007
XY3.4	1.75±0.08	14.15±1.37	3.29±0.28	33.52±2.47	5.58±0.08	59.39±1.91	36.43±2.26	0.003±0.000	6.98±0.43	78.00±8.19	57.89±6.53	0.009±0.003
XY3.5	1.75±0.15	14.22±1.53	3.35±0.30	37.09±4.26	5.00±0.59	62.88±7.83	39.37±4.86	0.003±0.001	6.47±0.57	76.67±6.00	52.33±3.87	0.007±0.001
XY3.6	1.68±0.12	14.48±1.21	3.86±0.65	44.09±6.14	5.71±0.38	72.45±7.63	43.15±4.12	0.004±0.001	7.17±0.55	92.22±8.00	64.22±8.03	0.012±0.004
XY3.7	1.69±0.06	14.88±0.93	3.28±0.26	42.93±3.56	5.36±0.52	69.2±13.81	42.59±4.99	0.004±0.001	7.18±0.40	93.67±13.61	71.56±11.16	0.014±0.005
XY4.1	1.74±0.18	15.82±1.62	2.73±0.25	30.64±3.86	4.14±0.78	49.17±16.04	29.45±11.25	0.002±0.001	5.78±0.83	79.00±12.25	52.11±9.74	0.007±0.003
XY4.2	1.88±0.15	15.93±2.05	3.87±0.21	47.33±2.97	6.02±0.32	85.02±13.94	55.13±5.49	0.007±0.002	8.26±0.44	114.67±5.85	78.56±5.03	0.019±0.003
Control	2.09±0.21	16.99±2.12	4.07±0.40	46.65±6.67	5.90±0.76	81.07±16.14	51.70±10.77	0.007±0.003	7.68±0.80	104.67±17.11	69.89±12.89	0.015±0.007
Triploid	1.98±0.28	16.94±2.84	3.89±0.61	45.17±9.54	5.71±0.71	73.22±14.36	46.67±10.36	0.005±0.003	7.42±0.91	94.44±19.56	66.14±14.92	0.014±0.008
Tetraploid	1.82±0.19	15.66±1.81	3.30±0.54	38.85±7.52	5.05±0.95	65.26±20.11	41.12±13.61	0.004±0.003	6.81±1.25	91.44±19.52	61.56±14.69	0.011±0.007

Note: (H1): 1-year-old tree height; (H2): 2-year-old tree height; (H3): 3-year-old tree height; (H4): 4-year-old tree height; (BD1): 1-year-old ground diameter; (BD 2): 2-year-old ground diameter; (BD 3): 3-year-old ground diameter; (BD 4): 4-year-old ground diameter; (DBH3): 3-year-old diameter at breast height; (DBH4): 4-year-old diameter at breast height; (V3): 3-year-old volume; (V4): 4-year-old volume.

**Table S3.** Principal component analysis of three broad categories

Principal component factor	Component I	Component II	Component III
Eigenvalue	9.787	3.836	3.448
Contribution (%)	46.61	18.27	16.42
Cumulative contribution (%)	46.61	64.88	81.30
LL	0.468	0.632	0.071
LW	-0.057	0.965	0.094
LA	0.265	0.920	0.139
LSI	0.524	-0.575	-0.086
Pn	0.053	0.014	0.184
Gs	0.165	-0.012	0.889
Ci	0.150	-0.035	0.919
Tr	-0.101	0.183	0.899
WUE	0.197	-0.240	-0.882
H1	0.613	0.547	0.170
BD1	0.526	0.754	0.027
H2	0.897	0.241	0.152
BD2	0.833	0.434	0.047
H3	0.936	-0.007	-0.016
BD3	0.926	0.245	0.147
DBH3	0.963	0.151	0.052
V3	0.966	0.103	0.026
H4	0.834	0.055	-0.221
BD4	0.940	0.157	0.058
DBH4	0.956	0.003	-0.063
V4	0.938	0.003	-0.134

Note: (Pn): net photosynthesis rate; (Ci): intercellular CO<sub>2</sub> concentration; (Gs): stomatal conductance; (Tr): transpiration rate; (WUE): water use efficiency; (LL): leaf length; (LW): leaf weight; (LA): leaf area; (LSI): leaf shape index; (H1): 1-year-old tree height; (H2): 2-year-old tree height; (H3): 3-year-old tree height; (H4): 4-year-old tree height; (BD1): 1-year-old ground diameter; (BD 2): 2-year-old ground diameter; (BD 3): 3-year-old ground diameter; (BD 4): 4-year-old ground diameter; (DBH3): 3-year-old diameter at breast height; (DBH4): 4-year-old diameter at breast height; (V3): 3-year-old volume; (V4): 4-year-old volume.