



**Figure S1.** Schematic diagram of experimental site

**Table S1.** Data preprocessing statistics and quality control

	Sample name	Raw-reads	Clean-reads	Base(nt)	AvgLen(nt)	Q20	GC%	Effective%
991 (01)	S0101	88196	80125	32875189	410	72.61	54.48	90.85
	S0102	59448	54946	22458628	408	74.53	54.93	92.43
	S0103	86715	84340	34542208	409	71.06	53.88	97.26
	Average	78119.67	73137.00	29958675.00	409.00	72.73	54.43	93.51
A1 (02)	S0201	88142	81358	33152034	407	71.01	55.71	92.30
	S0202	79162	76692	31315598	408	70.85	55.35	96.88
	S0203	62074	58765	23921904	407	71.46	55.07	94.67
	Average	76459.33	72271.67	29463178.67	407.33	71.11	55.38	94.62
(03)	Xiangyou1035 S0301	88926	80043	32580228	407	72.24	54.09	90.01
	S0302	83834	80102	32758081	408	71.58	54.30	95.55

	S0303	86043	80171	32599803	406	76.21	55.40	93.18
	Average	86267.67	80105.33	32646037.33	407.00	73.34	54.60	92.91
Brassica Campestris (04)	S0401	70591	68157	27774453	407	73.92	55.01	96.55
	S0402	86447	80246	32689419	407	71.48	54.74	92.83
	S0403	68144	64660	26329675	407	70.87	55.22	94.89
	Average	75060.67	71021.00	28931182.33	407.00	72.09	54.99	94.76
Purple leaf mustard (05)	S0501	86483	78700	32115678	408	72.36	55.09	91.00
	S0502	88023	80187	32859756	409	72.65	54.19	91.10
	S0503	83820	80095	32757334	408	71.95	54.08	95.56
	Average	86108.67	79660.67	32577589.33	408.33	72.32	54.45	92.55
Green leaf mustard (06)	S0601	85662	80095	32761513	409	75.35	55.64	93.50
	S0602	87697	80087	32575717	406	70.83	55.82	91.32
	S0603	82685	80116	32753870	408	77.27	55.49	96.89
	Average	85348.00	80099.33	32697033.33	407.67	74.48	55.65	93.90
Rhubarb mustard (07)	S0701	86186	80070	32773259	409	79.98	54.63	92.90
	S0702	82152	79508	32297683	406	78.27	55.59	96.78
	S0703	68944	65330	26403528	404	78.61	55.41	94.76
	Average	79094.00	74969.33	30491490.00	406.33	78.95	55.21	94.81
Self-seeding in Xiafang (08)	S0801	77754	74752	30332220	405	78.08	55.69	96.14
	S0802	77495	71258	28929618	405	80.49	54.36	91.95
	S0803	63198	61583	25031980	406	79.18	54.83	97.44
	Average	72815.67	69197.67	28097939.33	405.33	79.25	54.96	95.18
78 (09)	S0901	59088	57750	23547906	407	80.41	54.19	97.74
	S0902	89607	81659	33205745	406	81.33	54.09	91.13
	S0903	68833	64962	26416909	406	80.73	54.65	94.38
	Average	72509.33	68123.67	27723520.00	406.33	80.82	54.31	94.42
Wax rapeseed	S1001	82600	80083	32347573	403	78.03	55.74	96.95

in Chenxi	S1002	82082	80206	32721559	407	80.17	54.65	97.71
(10)	S1003	77327	73694	29942723	406	80.17	54.20	95.30
	Average	80669.67	77994.33	31670618.33	405.33	79.46	54.86	96.65
Xiangyou No.4 (11)	S1101	80024	76073	31207348	410	72.12	54.47	95.06
	S1102	87325	80150	32854183	409	75.48	55.21	91.78
	S1103	82007	80143	33012316	411	76.73	54.53	97.73
	Average	83118.67	78788.67	32357949.00	410.00	74.78	54.74	94.86
Raped in Huapingjing (12)	S1201	81783	77498	31388636	405	69.48	55.94	94.76
	S1202	83060	80139	32552136	406	70.88	55.38	96.48
	S1203	84888	80072	32612915	407	73.54	54.66	94.33
	Average	83243.67	79236.33	32184562.33	406.00	71.30	55.33	95.19
Youfei No. 1 (CK1, 13)	S1301	84032	80217	32466767	404	80.18	54.26	95.46
	S1302	86625	80021	32428148	405	77.95	54.90	92.38
	S1303	87428	80141	32554097	406	78.83	55.11	91.67
	Average	86028.33	80126.33	32483004.00	405.00	78.99	54.76	93.17
Youfei No. 2 (CK2, 14)	S1401	72845	69179	27918963	403	77.70	55.56	94.97
	S1402	62667	58598	23864398	407	78.21	54.32	93.51
	S1403	89090	85108	34549065	405	78.05	54.98	95.53
	Average	74867.33	70961.67	28777475.33	405.00	77.99	54.95	94.67
natural soil (CK3, 00)	S0001	85910	80256	33287160	414	83.67	55.90	93.42
	S0002	55373	53462	22106675	413	81.66	56.97	96.55
	S0003	88517	80129	33096395	413	80.14	54.81	90.52
	Average	76600.00	71282.33	29496743.33	413.33	81.82	55.89	93.50

**Table S2.** Basic characters of oilseed rape before decomposition

Sample number	Moisture content%	Lignin%	Cellulose%
1	99.85	20.43	27.68
2	99.84	15.98	29.80
3	99.83	16.04	24.33
4	99.86	15.77	27.51
5	99.79	21.25	26.60
6	99.83	17.88	23.47
7	99.83	19.30	24.25
8	99.87	10.34	26.09
9	99.86	14.02	29.74
10	99.78	14.34	27.24
11	99.85	15.36	26.82
13	99.85	14.33	30.05
CK1	99.80	8.64	29.37
CK2	99.85	11.09	26.95