

Table S1. Experimental design

Treatment	Material	Note
CK	No N fertilizer and PPM	——
N300	100% N fertilizer	N: 300 kg/ha
PN180	PPM + 60% N fertilizer	PPM: 12 kg/hm ² ; N: 180 kg/ha
PN240	PPM + 80% N fertilizer	PPM: 12 kg/hm ² ; N: 240 kg/ha
PN300	PPM + 100% N fertilizer	PPM: 12 kg/hm ² ; N: 300 kg/ha

Table S2. Wheat plant height under different polymer and nitrogen combination treatments.

Variety	Time	Treatment	Three-leaf stage	Jointing stage	Flowering stage	Maturity
2020						
XC29		N300	13.7±0.1c	41.17±0.5a	66.24±0.04b	80.65±0.05b
		PN300	15.3±0.2a	41.53±1a	70.83±1.67a	86.2±2.00a
		PN240	14.15±0.1b	41.13±0.53a	72.08±1.25a	87.7±1.50a
		PN180	13.7±0.25c	40.07±0.87a	66.21±0.96b	80.65±1.15b
		CK	12.3±0.05d	40.03±0.97a	57.75±1.42c	70.5±1.7c
XC38		N300	15.55±0.2d	49.17±0.7a	66.88±1.13ab	79.25±0.25b
		PN300	17.05±0.3b	51.13±1.4a	68.54±1.71a	83.45±2.05a
		PN240	17.42±0.03a	42±0.67b	67.08±0.08ab	81.7±0.1a
		PN180	16.05±0.15c	41.6±1.73b	66.25±0.42ab	80.7±0.5ab
		CK	15.73±0.03d	39.35±1.12c	64.58±2.08b	76.8±0.6c
2021						
XC29		N300	13.79±0.29b	42.12±0.85a	65.55±0.66b	81.19±1.68b
		PN300	15.55±0.23a	41.81±0.86a	72.48±1.47a	85.34±0.86a
		PN240	14.24±0.43b	40.18±0.85b	72.56±1.50a	86.25±1.81a
		PN180	13.79±0.29b	39.13±1.01b	64.67±1.37b	78.7±2.03b
		CK	12.67±0.37c	39.25±0.78b	56.03±1.71c	70.97±1.40c
XC38		N300	15.91±0.32b	49.97±1.03a	67.32±1.39ab	80.54±1.67a b
		PN300	17.66±0.53a	51.47±1.06a	69.00±1.43a	79.88±3.32a b
		PN240	17.54±0.36a	40.20±1.67b	67.79±1.21ab	83.03±1.72a
		PN180	16.16±0.49b	40.36±1.23b	64.28±1.96c	81.24±1.68a b
		CK	15.36±0.39b	39.99±0.83b	65.01±1.34bc	77.31±1.60b
	V	ns	ns	ns	ns	ns
	T	**	**	**	**	**
	Y	ns	ns	ns	ns	ns
	V×T	ns	ns	ns	ns	ns
	V×Y	ns	ns	ns	ns	ns
	V×T×Y	ns	ns	ns	ns	ns

Note: V: Variety, T: Treatment, Y: Year. Different lowercase letters in the same column indicate significant difference between groups (** p < 0.01, ns: p > 0.05)

Table S3. Wheat Biomass under different polymer and nitrogen combination treatments.

Time Orga ns	Three-leaf stage		Jointing stage		Flowering stage			Maturity				
	Stem	Leaf	Stem	Leaf	Stem	Leaf	Ear	Stem	Leaf	Ear	Grain	
2020												
XC29	N300	1672.70±6	1198.53±2	2354.36±7	2480.71±1	4818.21±1	2215.31±1	2089.71±4	4297.21±1	1852.82±1	1713.76±6	5942.76±1
		0.92d	4.38bc	6.70d	51.88c	75.47c	35.63b	2.51c	40.00c	8.52d	2.41c	52.65c
	PN300	2114.86±4	1195.93±1	3339.14±6	3102.36±7	6057.11±2	2632.89±6	2728.43±5	5425.95±1	2741.16±4	2062.87±4	6537.84±2
		3.02b	8.21bc	7.92a	9.69a	20.59b	7.63a	5.50a	37.00b	1.73a	1.96b	13.00b
	PN240	2406.88±4	1172.09±1	2433.87±4	3038.11±3	7071.16±1	2240.21±5	2646.59±6	6760.94±2	2071.36±6	2515.58±5	8964.91±2
		8.96a	7.84c	9.50cd	0.38a	43.84a	6.56b	7.98a	46.23a	7.48c	1.17a	30.28a
	PN180	1966.03±6	1354.5±20.	2760.76±1	2694.48±6	6046.90±1	2674.66±2	2215.49±7	3963.97±1	2159.97±3	1439.75±2	5261.16±5
		4.05c	62a	00.54b	9.21b	23.00b	6.746a	2.18b	44.36d	2.88b	9.28d	2.61d
	CK	1531.80±3	1240.83±4	2562.31±6	1938.24±7	4759.68±1	2211.64±5	1497.20±5	5337.69±8	1281.69±2	1702.07±1	5011.28±1
		1.16e	0.42b	4.69c	0.59d	55.06c	5.84b	4.52d	1.26b	6.07e	7.02c	82.50d
XC38	N300	1866.11±6	1464.48±2	2765.14±1	2493.37±8	5679.86±5	2865.60±1	2191.84±3	6029.10±2	3340.90±8	2200.57±4	6925.93±6
		7.96b	2.29c	00.70c	1.23b	6.79b	04.36c	3.36b	19.57c	5.81b	4.76d	9.25c
	PN300	1713.63±4	1618.62±2	2712.20±9	3087.92±1	6226.30±1	3745.21±5	2090.56±7	6715.85±2	3215.28±4	2609.5±53	7905.42±7
		3.26c	4.64b	8.77c	00.60a	59.93a	7.01a	6.13b	18.80b	8.95c	.08b	9.05b
	PN240	2181.72±3	1781.61±3	3565.48±3	3125.22±1	6374.53±1	3358.88±6	2321.05±8	5124.59±1	3780±37.8	2750.65±5	8998.57±2
		3.21a	6.24a	5.65a	13.81a	29.67a	8.32b	4.53a	29.39d	0a	5.95a	31.14a
	PN180	1844.85±2	1189.05±2	2956.24±2	2038.27±6	5576.39±2	2984.47±2	1640.99±4	7279.85±1	2459.17±3	2295.87±4	5592.00±1
		8.08b	4.19d	9.56b	6.41c	03.09b	9.84c	1.44c	48.09a	7.44d	6.70c	41.20d

[illegible]

V×T	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns	ns
V×Y	**	**	**	**	**	**	**	**	**	**	**
V×T× Y	**	**	**	**	**	**	**	**	**	**	**

Note: V: Variety, T: Treament, Y: Year. Different lowercase letters in the same column indicate significant difference between groups (** p <0.01, ns: p > 0.05).