Supplementary Material

**Figure S1** Light energy conversion efficiency of maximum PSII ($F_v/F_m$) of Chinese fir in July 2017 (a), October 2017 (b), January 2018 (c), and April 2018 (d) under different N and P addition treatment (N0: no N addition; N30: 30 kg N·ha$^{-1}$·yr$^{-1}$; N60: 60 kg N·ha$^{-1}$·yr$^{-1}$; N90: 90 kg N·ha$^{-1}$·yr$^{-1}$; P0: no P addition; P20: 20 mg·kg$^{-1}$; P40: 40 mg·kg$^{-1}$) ($n = 3$). Different capital letters indicate significant differences among P addition treatments under N0 addition ($p < 0.05$). Different lowercase letters indicate significant differences among N deposition treatments at the identical P addition ($p < 0.05$). Error bars indicate standard errors.

**Figure S2** Non-photochemical quenching coefficient ($q_N$) of Chinese fir in July 2017 (a), October 2017 (b), January 2018 (c), and April 2018 (d) under different N and P addition treatment (N0: no N addition; N30: 30 kg N·ha$^{-1}$·yr$^{-1}$; N60: 60 kg N·ha$^{-1}$·yr$^{-1}$; N90: 90 kg N·ha$^{-1}$·yr$^{-1}$; P0: no P addition; P20: 20 mg·kg$^{-1}$; P40: 40 mg·kg$^{-1}$) ($n = 3$). Different capital letters indicate significant differences among P addition treatments under N0 addition ($p < 0.05$). Different lowercase letters indicate significant differences among N deposition treatments at the identical P addition ($p < 0.05$). Error bars indicate standard errors.

**Figure S3** Non-photochemical quenching coefficient (Y(II)) of Chinese fir in July 2017 (a), October 2017 (b), January 2018 (c), and April 2018 (d) under different N and P addition treatment (N0: no N addition; N30: 30 kg N·ha$^{-1}$·yr$^{-1}$; N60: 60 kg N·ha$^{-1}$·yr$^{-1}$; N90: 90 kg N·ha$^{-1}$·yr$^{-1}$; P0: no P addition; P20: 20 mg·kg$^{-1}$; P40: 40 mg·kg$^{-1}$) ($n = 3$). Different capital letters indicate significant differences among P addition treatments under N0 addition ($p < 0.05$). Different lowercase letters indicate
significant differences among N deposition treatments at the identical P addition ($p < 0.05$). Error bars indicate standard errors.

**Figure S4** Soil available nitrogen (AN) of Chinese fir in July 2017 (a), October 2017 (b), January 2018 (c), and April 2018 (d) under different N and P addition treatment (N0: no N addition; N30: 30 kg N·ha$^{-1}$·yr$^{-1}$; N60: 60 kg N·ha$^{-1}$·yr$^{-1}$; N90: 90 kg N·ha$^{-1}$·yr$^{-1}$; P0: no P addition; P20: 20 mg·kg$^{-1}$; P40: 40 mg·kg$^{-1}$) ($n = 3$). Different lowercase letters indicate significant differences among different treatments ($p < 0.05$). Error bars indicate standard errors.

**Figure S5** Soil available phosphorous (AP) of Chinese fir in July 2017 (a), October 2017 (b), January 2018 (c), and April 2018 (d) under different N and P addition treatment (N0: no N addition; N30: 30 kg N·ha$^{-1}$·yr$^{-1}$; N60: 60 kg N·ha$^{-1}$·yr$^{-1}$; N90: 90 kg N·ha$^{-1}$·yr$^{-1}$; P0: no P addition; P20: 20 mg·kg$^{-1}$; P40: 40 mg·kg$^{-1}$) ($n = 3$). Different lowercase letters indicate significant differences among different treatments ($p < 0.05$). Error bars indicate standard errors.
Figure S1

(a) July 2017

(b) October 2017

(c) January 2018

(d) April 2018

Nitrogen treatment

Nitrogen treatment

$F_{i}/F_{m}$

$F_{i}/F_{m}$
Figure S2

(a) July 2017
(b) October 2017
(c) January 2018
(d) April 2018

qN

Nitrogen treatment

N0, N30, N60

p0, p20, p40
Figure S3

(a) July 2017

(b) October 2017

(c) January 2018

(d) April 2018

Y(t)

Nitrogen treatment

N0  N30  N60

P0  P30  P40
Figure S4

(a) July 2017

(b) October 2017

(c) January 2018

(d) April 2018

Available nitrogen (mg kg⁻¹)

Nitrogen treatment

N0  N30  N60

P0  P20  P40
Figure S5

(a) July 2017

(b) October 2017

(c) January 2018

(d) April 2018