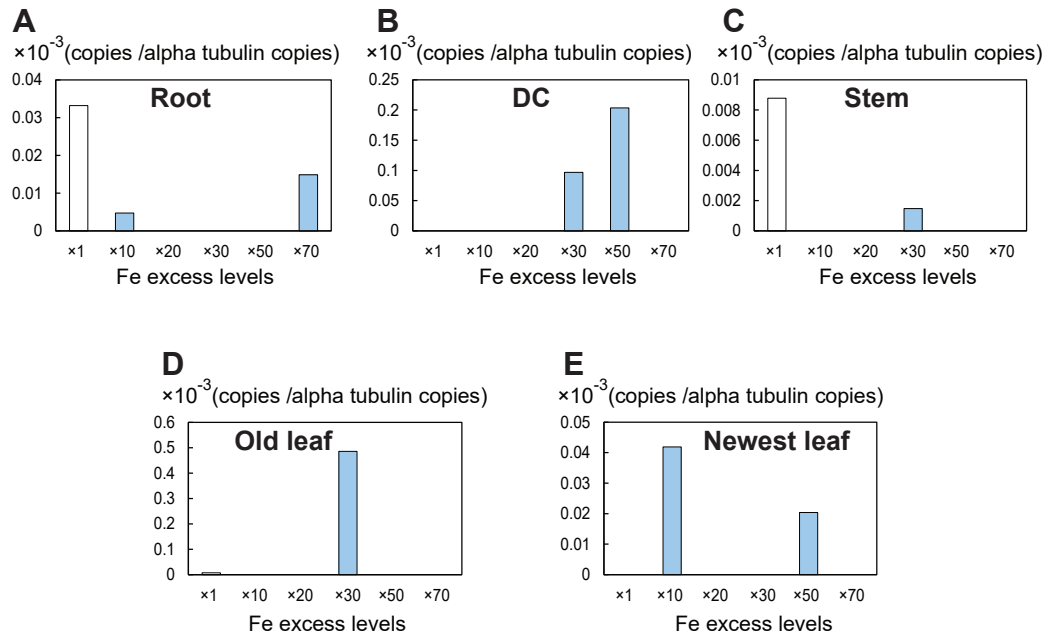
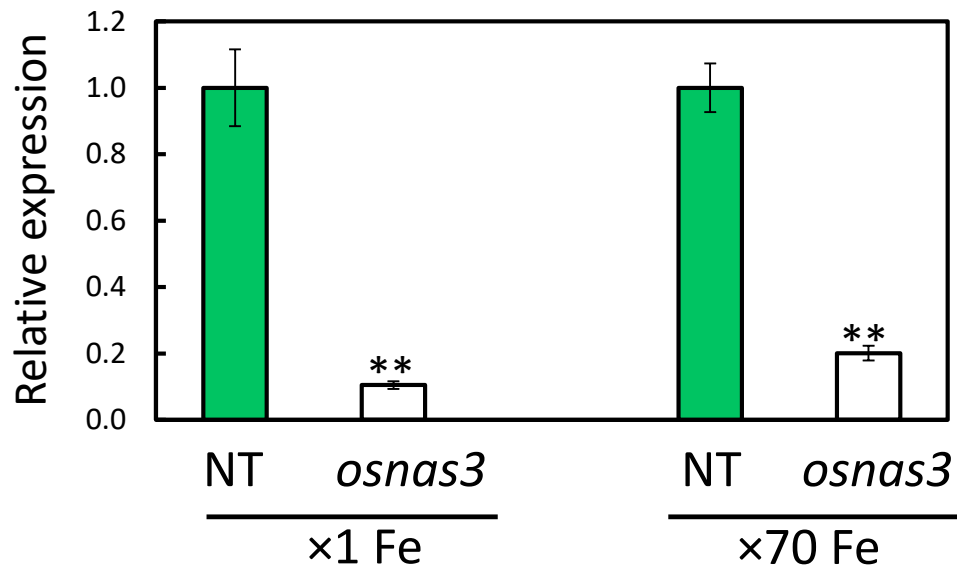


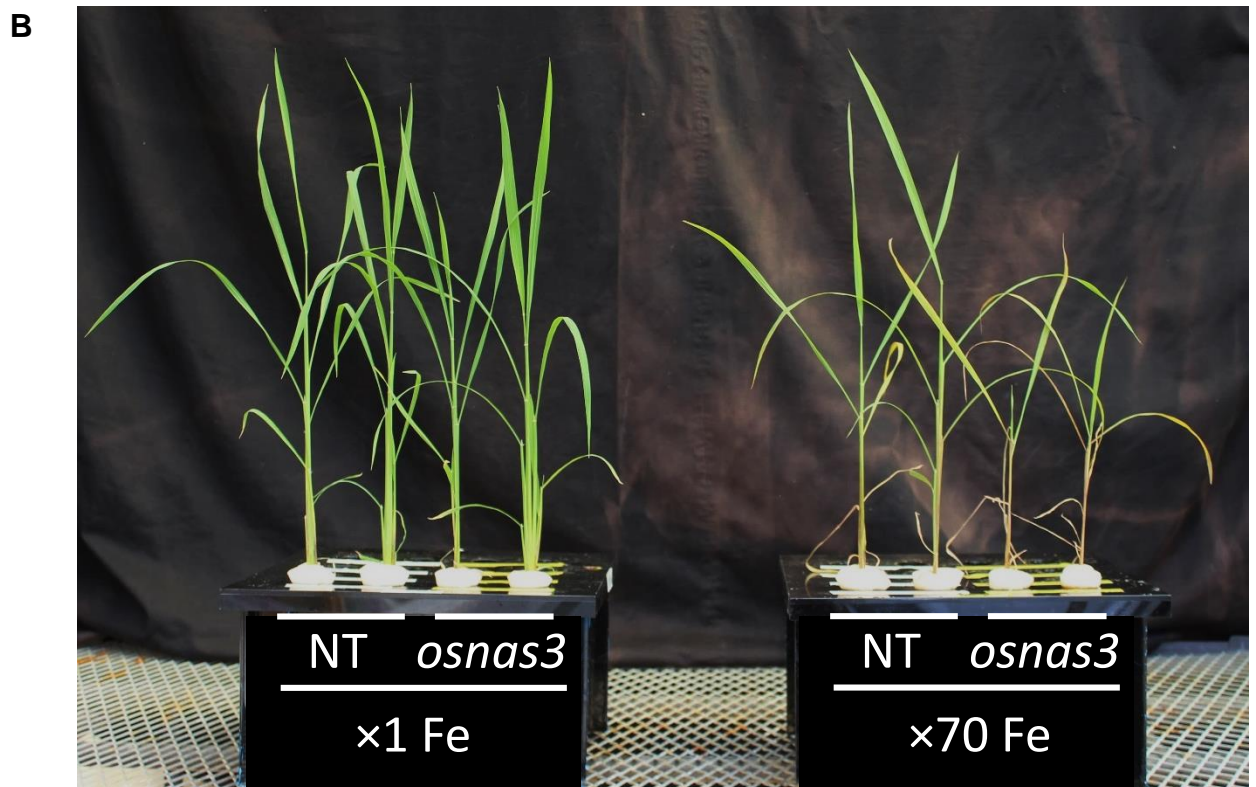
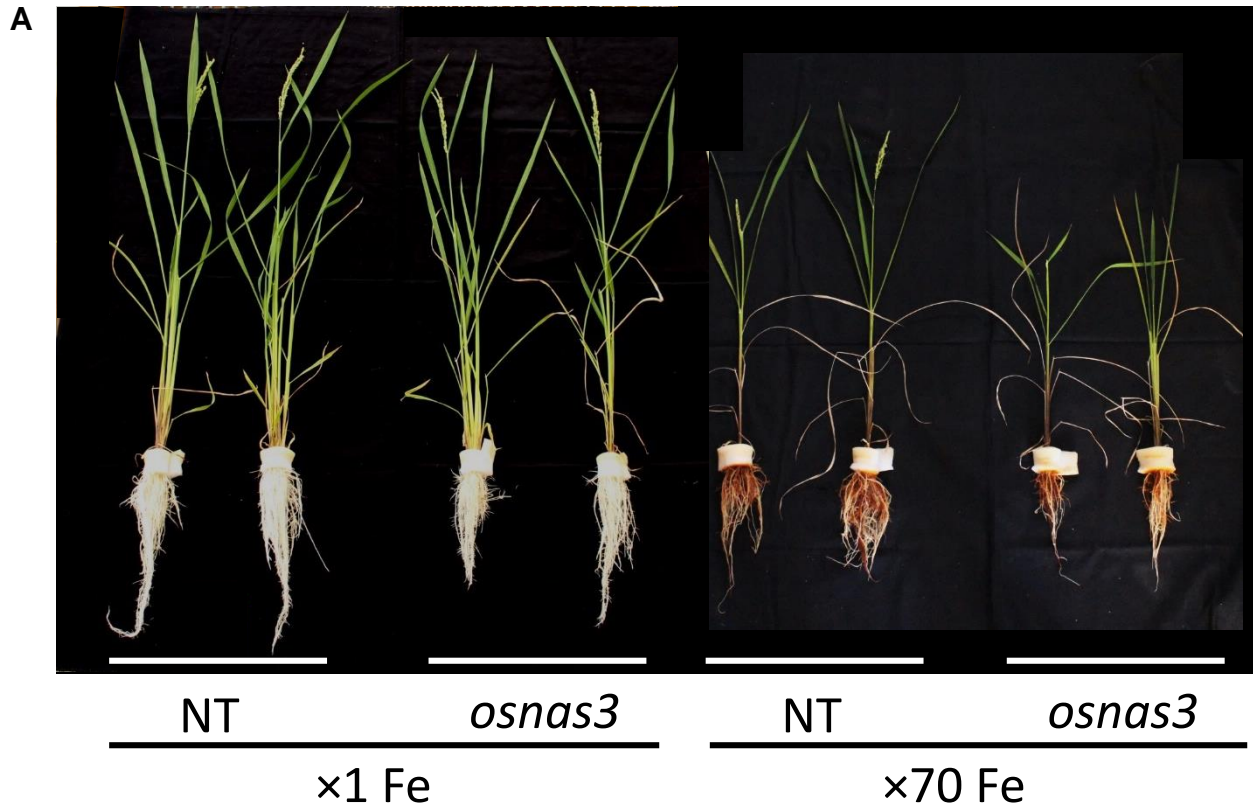
SUPPLEMENTARY FIGURE 1 | Cellular localization of 35S promoter-OsNAS3 GUS expression in transgenic rice plants. **(A)** Lateral roots of the basal portion of mature roots under Fe excess. **(B)** Fe-excess old leaves. Red arrows, chloroplasts inside mesophyll cells. **(C)** Control newest leaf. **(D)** Fe-excess newest leaf. **(E)** Outer layer of DC in control plant. **(F)** Outer layer of Dc in Fe-excess plant. Scale bars: 20 μm for **B,C,D**; 50 μm for **A**; 500 μm for **E,F**.



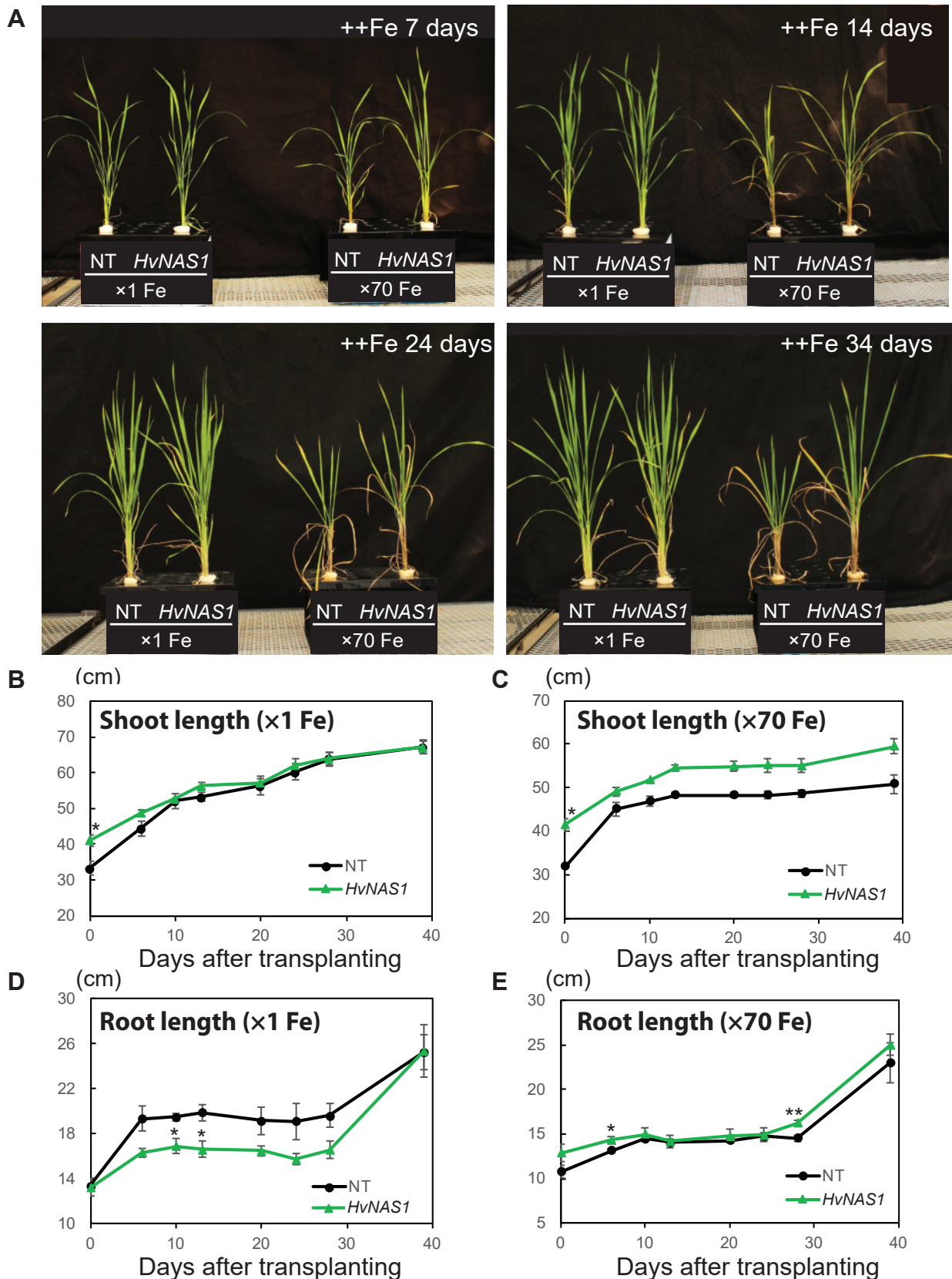
SUPPLEMENTARY FIGURE 2 | Expression levels of the *OsNAAT1* gene in rice tissues under control and various Fe excess conditions. **(A)** Roots. **(B)** DCs. **(C)** Stems. **(D)** Old leaves. **(E)** Newest leaves. DC: discrimination center. This figure shows confirmation of the microarray results listed in Table 1 of Aung et al. (2018) from qPCR analyses. Transcript levels were normalized to the expression levels of alpha-*tubulin* determined using the primers of alpha-*Tubulin*.



SUPPLEMENTARY FIGURE 3 | Expression of *OsNAS3* knockout plants and NT determined through qPCR analyses. Error bars represent ± 1 SE of technical replicates, $n = 3$. Data were normalized to the observed expression levels of *alpha-Tubulin* and presented as relative gene expression in each tissue ($\times 1$ Fe = 1). Asterisks above the bars indicate significant differences ($*P < 0.05$; $**P < 0.01$) compared to control ($\times 1$ Fe).



SUPPLEMENTARY FIGURE 4 | Plant appearance of NT and *OsNAS3* knockout plants under normal and excess Fe conditions. **(A)** First experiment after 39 days of Fe excess exposure. **(B)** Second experiment after 23 days of Fe excess exposure.



SUPPLEMENTARY FIGURE 5 | Plant appearance and growth of elevated NA production rice and non-transformant (NT). **(A)** Appearance of NAS-overexpressing and NT plants under control or Fe excess after 7, 14, 24, and 34 days. **(B,C)** Shoot lengths and **(D,E)** Root lengths under control and excess Fe. Error bars represent the standard error (SE) of biological replicates, $n = 4$ for NT and $n = 3$ for overexpressing plants. Plants were grown hydroponically under control ($\times 1$ Fe) and excess ferrous Fe ($\times 70$ Fe) conditions at pH 4.0. Asterisks indicate significant differences compared to the NT at each time point (* $P < 0.05$, ** $P < 0.01$).