The growing scarcity of worldwide water for agriculture is limiting the cultivation of flooded rice. This, combined with the shortage of land and labor resources, prompts farmers to adopt new methods of crop establishment. Direct-seeded rice (DSR) method is an emerging cultivation system with the advantage of easier and faster planting. It’s easier because it requires less labor and promotes more efficient water use and it’s faster because under DSR, crop maturity comes 10-12 days earlier than the average. Nitrogen fertilizer application is also widely adopted for enhancing grain production. The reported experiment was done to identify the most suitable rice genotype and nitrogen level combination under the transplanted and direct seeded rice systems. Grain and straw yields at harvest were reported in the companion poster P389, while the dynamics of plant nitrogen content and dry matter accumulation are discussed here.

Dynamics of the growth of the plant shoot weight influenced by the cropping method and (a) the variety and (b) the N fertilization

The strong reduction of the rate of plant biomass accumulation under DSR from week 13 onwards support that cropping method is the most influential factor in the growth of biomass. Next is the variety as shown by JKP 3333 growing faster than others. N doses only played a marginal influence on the total biomass.


dynamics of the plant N content influenced by the cropping method and (a) the variety and (b) the N fertilization

Like in biomass accumulation, cropping method was the factor that influenced the plant N content most. N plant content decreases faster in TPR plants due to the faster growth in biomass, as predicted by the known N dilution effect. Varieties showed small differences in plant N content although JKP 3333 consistently has the highest. The N application rate influenced the plant N content more evidently around week 10 without any effect on the biomass accumulation.

Conclusions

Biomass accumulation was faster and yield was higher in TPR despite consistently lower plant N content compared to DSR. On the other hand, grain N content was much higher in TPR plants. Among the varieties, JKP-3333 showed a significantly higher N content in all the plant parts at harvest and during the whole crop duration. As N application rates increased, the total N content in rice plants, whether under DSR or TPR, also increased significantly.