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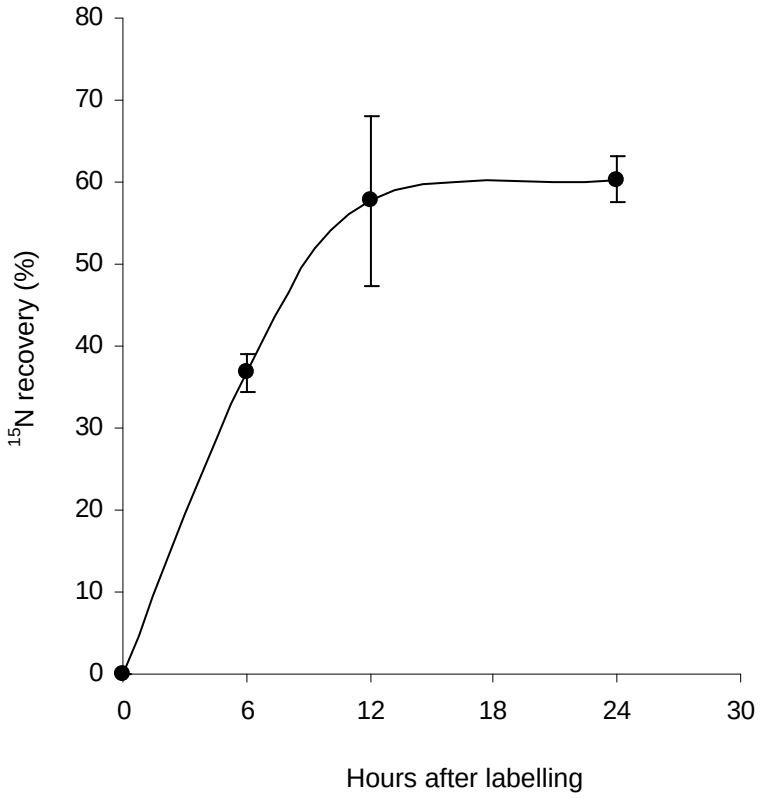

Fig. S1. Growth of the endosperm relies completely on substrate supply from vegetative tissues. A method to label N dynamics by applying ^{15}N at a rate calculated to supply about 10% worth of N uptake per day has previously been published (Sheehy *et al.* 2004*a*, 2004*b*, 2005). In those studies, the pattern of ^{15}N recovery by all the plants is described by the following equation

$$y = a(1 - \exp(bx)), \qquad \text{(S1)}$$

where a represents the maximum recovery of ^{15}N, and the initial slope of the curve is ab. The pattern of ^{15}N recovery in the present study fits the same equation where a = 60.32% and b = 0.10

h^{-1}. Sheehy et al. (2004*a*, 2004*b*, 2005) consistently report *a* as 5–7 higher than here. When plants were labelled during grain-filling, about 4–8% of the label was found in the roots (Sheehy *et al.* 2004*a*). In the present study, ^{15}N was only measured in the above-ground tissue, explaining the discrepancy. In addition, Sheehy *et al*. (2004*a*, 2004*b*) report values of *b* 7–10 times lower than reported in the present study, with variability explained by the stage of the plant when pulsed, leading to a range of 10–14 days to reach maximum recovery, compared to just 12 h in this study. It is probable that ^{15}N is much more available to roots when in solution culture than when in soil since dilution, exchange with other N and decay are avoided. A maximum recovery of about 60% is the same as found previously (Sheehy *et al.* 2004*a*, 2004*b*, 2005). We presume that the remaining ^{15}N was lost to volatilisation along the low resistance pathway through aerenchyma cells.

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