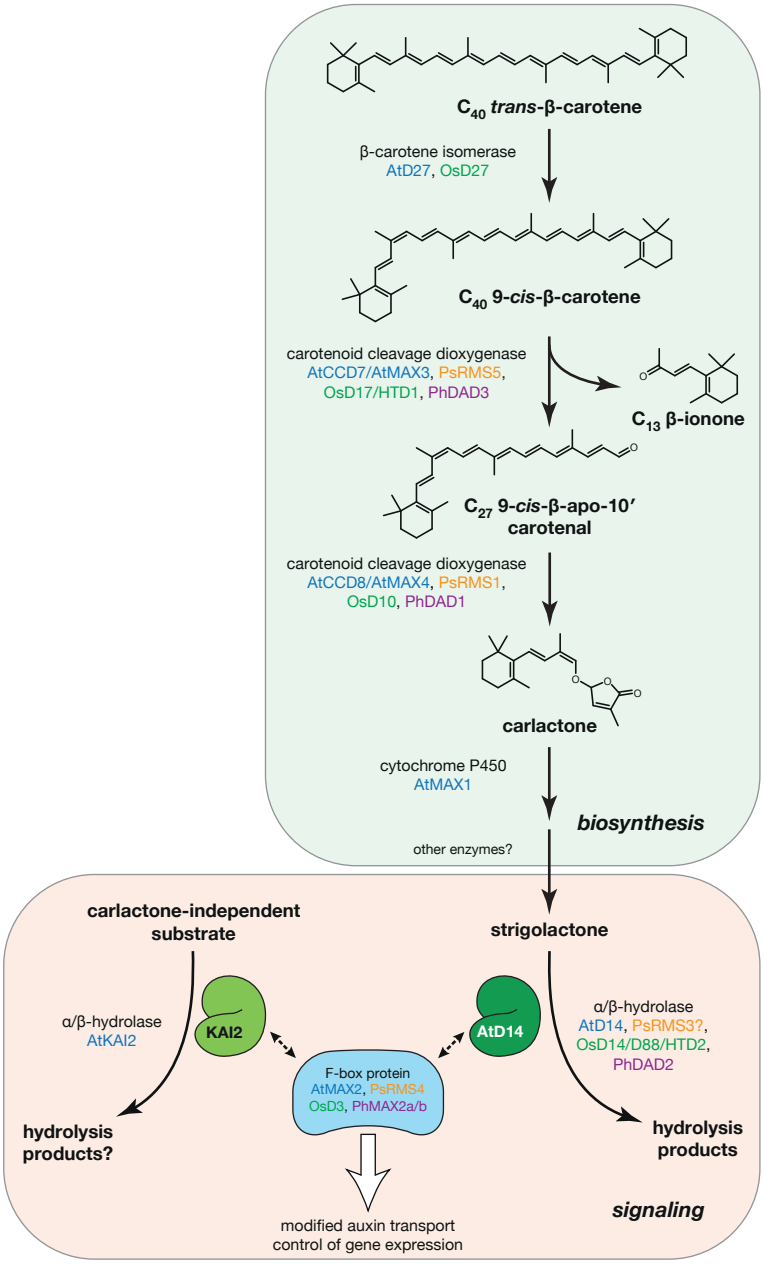

Figure S1. Working model for the carlactone pathway for the biosynthesis of strigolactones and their mode of action in the control of shoot branching.
Biosynthesis: β-carotene can be converted to carlactone (CL) by *E. coli* overexpressing β-carotene and harbouring β-carotene isomerase from rice (OsD27) and two carotenoid cleavage dioxygenases from Arabidopsis and pea (AtCCD7/PsRMS5 and AtCCD8/PsRMS1) (Alder et al., 2012). Other carotenoids have not been tested as substrates for OsD27, nor has the conversion of CL to strigolactones (SLs) been demonstrated. AtMAX1 acts downstream of CL (Waters et al., 2012a) but the enzymes assumed to be required to convert CL to SL have not been identified. Orthologous proteins have been identified in many other plant species; shown here are those with demonstrated enzymatic activity or biological function in plants. For recent reviews, see Ruyter-Spira et al. (2012) and Brewer et al. (2013).
Signaling: The hydrolase activity of orthologous proteins PhDAD2 and OsD14 has been demonstrated only towards the synthetic SL, GR24 (Hamiaux et al. 2012; Zhao et al. 2013). Physical interaction of PhDAD2 with PhMAX2a (dashed arrows) is implied from yeast 2-hybrid studies (Hamiaux et al. 2012), and assumed for other orthologous pairs. The AtKAI2-dependent pathway for seedling development in Arabidopsis is shown in the present study to be independent of AtD27, AtCCD7/AtMAX3 and AtCCD8/AtMAX4, and to be unresponsive to CL. The postulated substrate(s) for AtKAI2 is unknown, but is expected to be a butenolide with similarity to KARs and to GR24, both of which exhibit KAI2-dependent biological activity in seedlings. KAI2 substrates could potentially be SLs produced by a CL-independent pathway. Key: At, *Arabidopsis thaliana* (thale cress); Ph, *Petunia hybrida* (petunia); Os, *Oryza sativa* (rice); Ps, *Pisum sativum* (garden pea). CCD, carotenoid cleavage dioxygenase.