**Tsuruta K., Kume T., Komatsu H., Otsuki K.,** 2018. Effects of soil water decline on diurnal and seasonal variations in sap flux density for differently aged Japanese cypress (*Chamaecyparis obtusa*) trees. Ann. For. Res. 61(1): _-_.

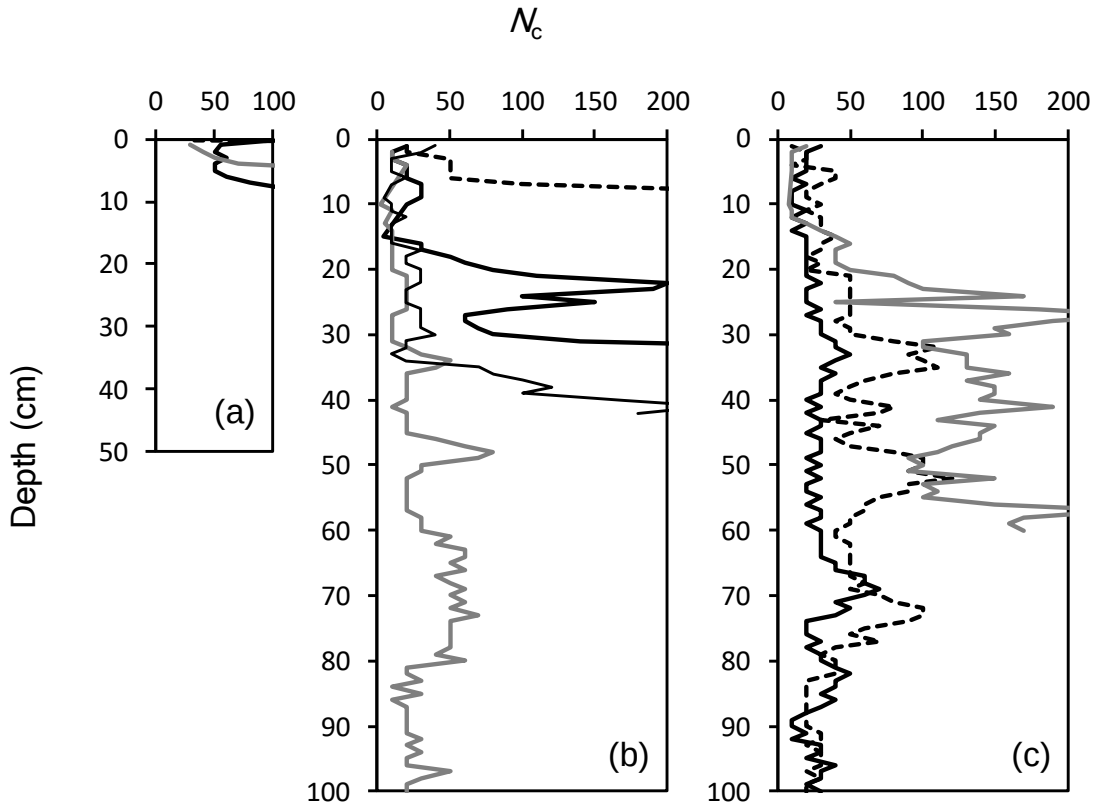


**Fig. S1** Profile of the number of blows required for a penetration of 10 cm ($N_c$) in small (a, S), medium (b, M), and large (c, L) stands. A penetration test to determine the $N_c$ value was conducted at three or four points in each stand. A penetrometer test was conducted at three or four points in each stand using a cone penetrometer with a cone diameter of 25 mm, a weight of 5 kg, and a fall distance of 50 cm. Soil depth was defined as the $N_c$ value. Previous studies suggested that the C horizon can be defined as the layer with $6 < N_c < 40$ (Yoshinaga and Ohnuki 1995; Ohnuki et al. 1997). In each stand, the maximum depth of $N_c < 40$ was 34 cm

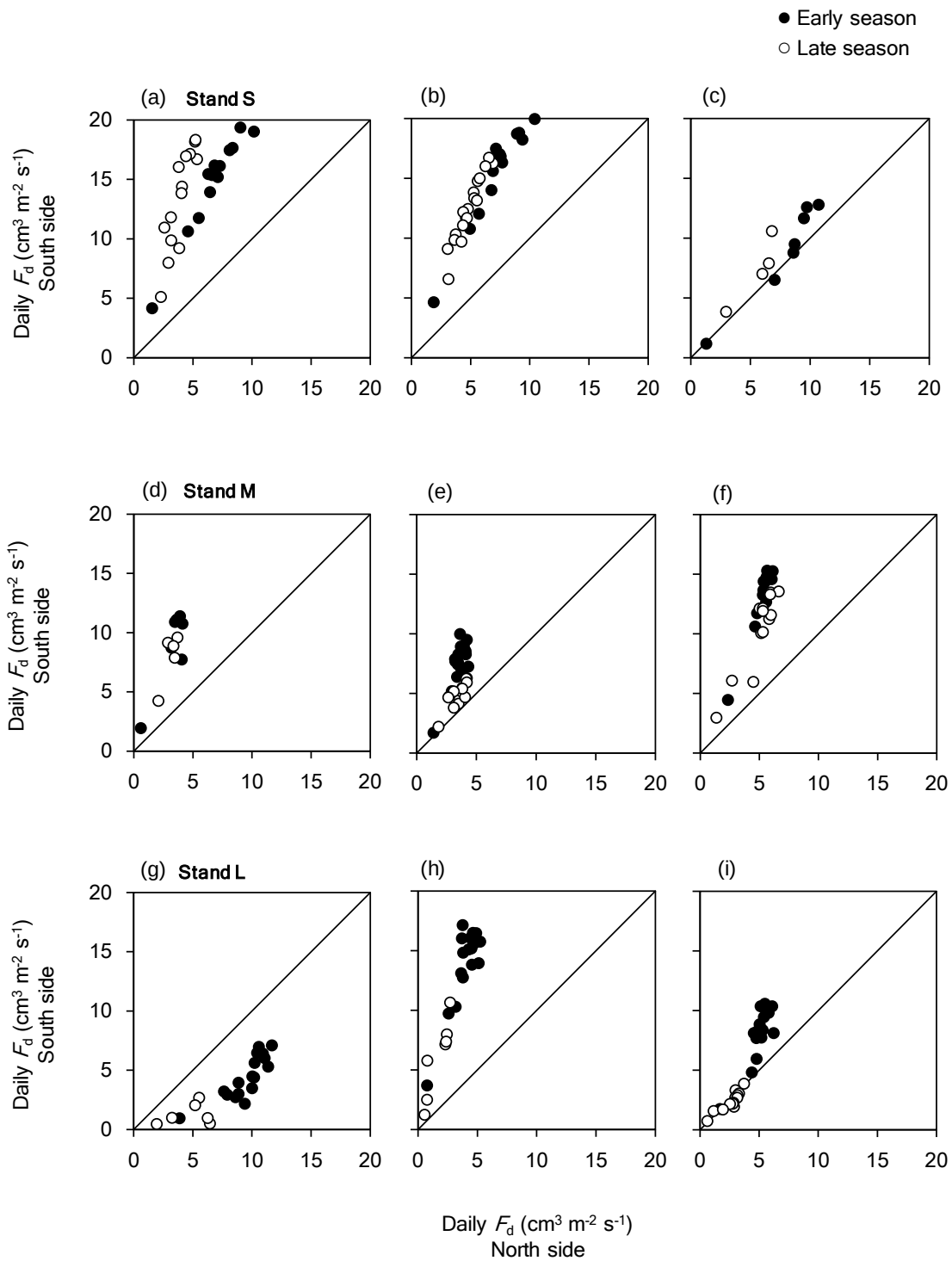


**Fig. S2** Relationship between daily sap flux density ($F_d$) measured at north and south sides for small (a–c, S), medium (d–f, M), and large (g–i, L) stands for the early (closed circles) and late (open circles) seasons. Relationships between $F_d$ at north and south sides were significantly different during the early and late seasons for (b), (e), (g), and (h) (analysis of covariance, $p <$ 0.01, 0.05, 0.1, and 0.05, respectively). A failure of sap flow sensors caused some $F_d$ data in the early season to be lost

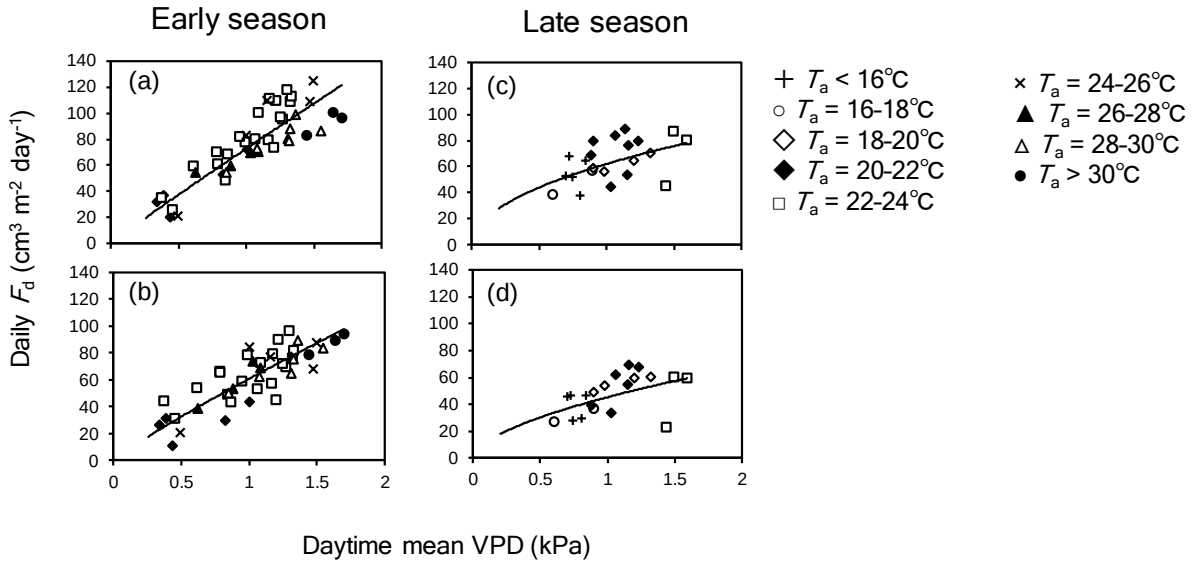


**Fig. S3** Relationship between daytime mean vapor pressure deficit (VPD) and daily sap flux density ($F_d$) for (a–b) the early and (c–d) late seasons in the small (S) stand. Data are classified according to air temperature ($T_a$). Data of one more tree in stand S is show in Fig. 6.

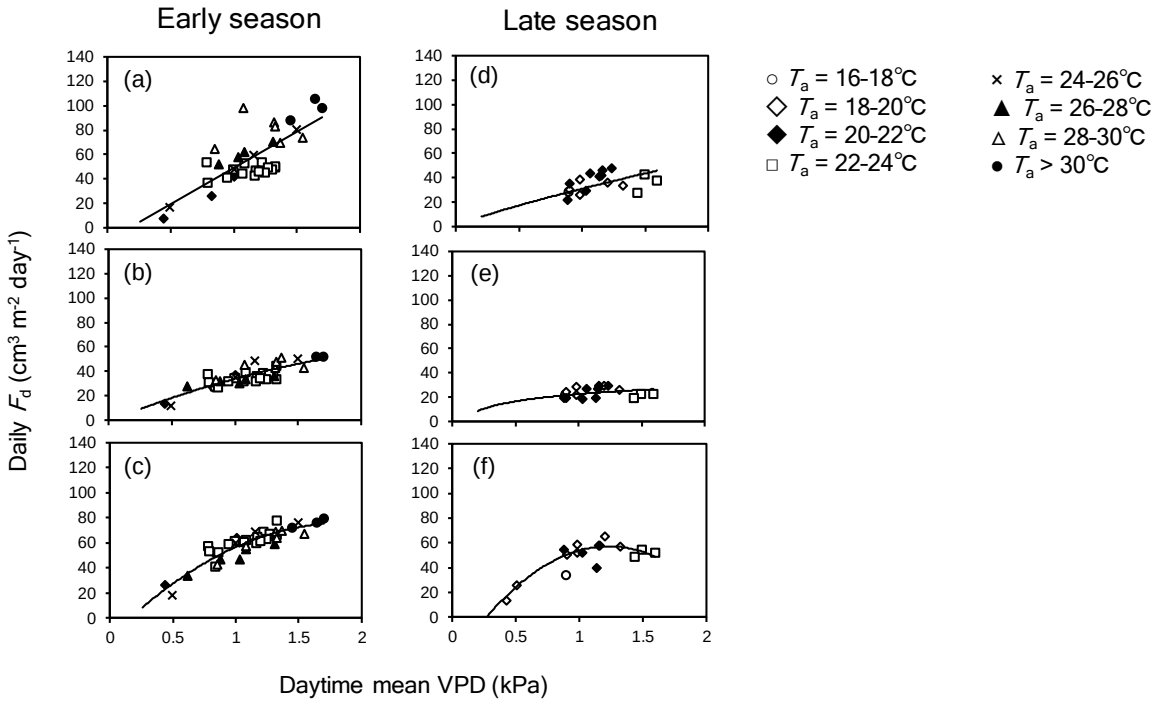


**Fig. S4** Relationship between daytime mean vapor pressure deficit (VPD) and daily sap flux density ($F_d$) for (a–c) the early and (d–f) late seasons in the medium (M) stand. Data are classified according to air temperature ($T_a$)

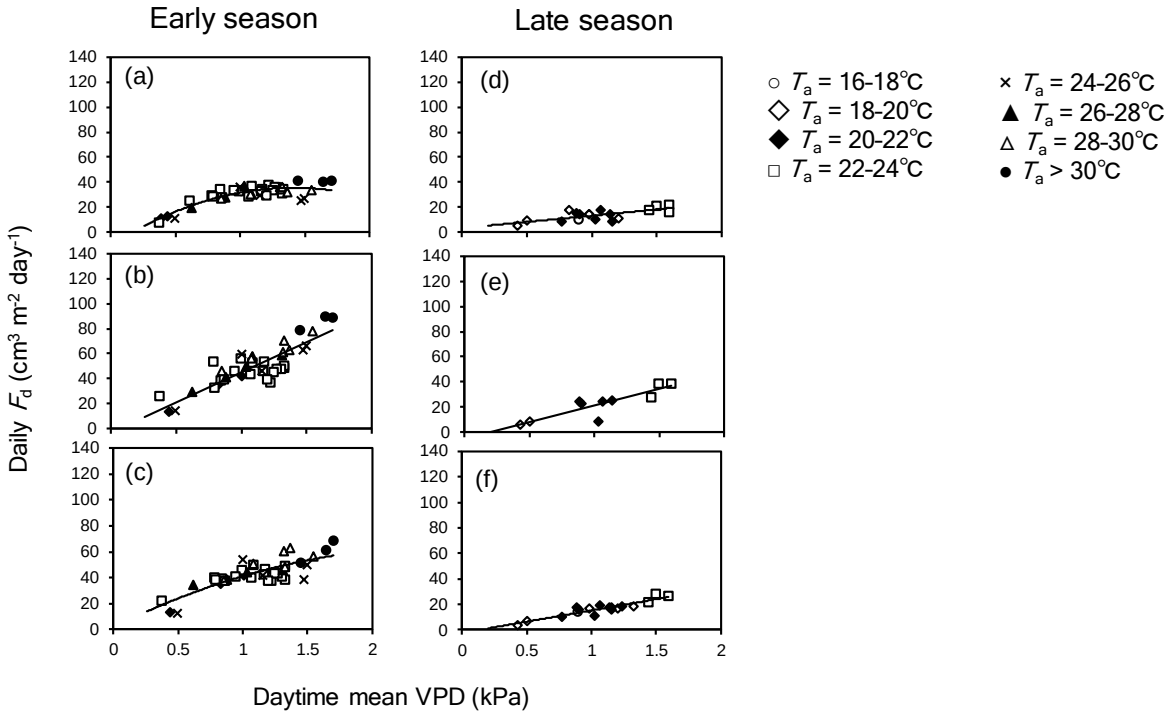


**Fig. S5** Relationship between daytime mean vapor pressure deficit (VPD) and daily sap flux density ($F_d$) for (a–c) the early and (d–f) late seasons in the large (L) stand. Data are classified according to air temperature ($T_a$)