Arundo donax (giant reed) is a pensive invader of riparian systems, and therefore a potentially good candidate for bio-control. As a part of an on-going study of A. donax heritability response, we investigated growth of 12 individuals grown from 4 x 3 cm rhizomes over a 5-month period (2/02-7/02). These plants were grown in 125 cm x 125 cm x 125 cm containers with mini-rhizotrons at 30 cm intervals, filled with felt sand. Plants received either de-ionized or well (high N) water via drip irrigation daily. For two months, (5-6/02) plants also received weak solutions (2x for high nutrient treatment) of a micro and macro nutrient fertilizer on a weekly basis. We measured growth weekly; above ground growth was measured by analyzing root pictures taken with a 3-D digitizer, and below ground growth was measured by analyzing root pictures taken with a mini-rhizotron camera. Photographic measurements were made using a LI-6400. Above and below ground growth, photosynthetic rate, and water use efficiency rates varied widely among individuals and did not consistently differ between treatments. However, all 12 plants had roots >1m deep within 4.5 months. A. donax in the field and in our pots reached photosynthetic saturation around 1000 PAR, but it closed stomata and stopped photosynthesizing between 28-31°C. However, they are not CO2 limited, typical of a C-3 grass. These preliminary results suggest that A. donax has been successful because it has high enough photosynthetic rates to compensate for its heat sensitivity, and deep root systems to access water during the dry season.

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