Table S1: Gas exchange traits from studies that assessed a nutrient limitation treatment, a water limitation treatment, or both. If no treatment is designated (i.e. "---") then all plants in that study received sufficient levels of that resource. Trait values are lsmeans ± 1 SE (presented as – SE and then + SE when unequal due to back transformation after log). F-values and associated degrees of freedom ($F_{df\ num,\ df\ denom.}$) are presented for each trait and model effect (PROC MIXED ANOVA, block as random). F-values in bold indicate statistical significance (* P<0.05, ** P<0.01, *** P<0.001).

Study and *Species*	**Nutrient treatment**	**Water treatment**	**g_{night} (mol m^{-2} s^{-1})**	**E_{night} (mmol m^{-2} s^{-1})**	**g_{day} (mol m^{-2} s^{-1})**	**E_{day} (mmol m^{-2} s^{-1})**	**Photosynthesis (μmol m^{-2} s^{-1})**
	Model effects						
Fall 2003-1							
H. annuus	sufficient	---	0.102 ± 0.017	1.36 ± 0.17	---	---	---
	limiting	---	0.102 ± 0.017	1.42± 0.17	---	---	---
	Nutrient effect		0.00 $_{1,10}$	0.06 $_{1,10}$	---	---	---
H. anomalus	sufficient	---	0.166 ± 0.021	1.69 ± 0.16	---	---	---
	limiting	---	0.130 ± 0.021	1.47 ± 0.16	---	---	---
	Nutrient effect		2.8 $_{1,10}$	1.85 $_{1,10}$	---	---	---
H. deserticola	sufficient	---	0.225 ± 0.052	2.46 ± 0.45	---	---	---
	limiting	---	0.134 ± 0.062	1.84 ± 0.53	---	---	---
	Nutrient effect		1.27 $_{1, 8}$	0.82 $_{1, 8}$	---	---	---
H. petiolaris							
	sufficient	---	0.121 ± 0.022	1.57 ± 0.25	---	---	---
	limiting	---	0.066 ± 0.024	1.01 ± 0.27	---	---	---
	Nutrient effect		3.78 $_{1, 9}$	3.54 $_{1, 9}$	---	---	---
Fall 2003-2							
H. annuus dom.	sufficient	sufficient	0.035 ± 0.004	0.42 –0.07, +0.09	1.272 ± 0.161	7.79 ± 0.80	27.8 ± 2.5
	sufficient	limiting	0.012 ± 0.004	0.15 –0.03, +0.03	0.460 ± 0.161	4.04 ± 0.80	12.8 ± 2.5
	limiting	sufficient	0.023 ± 0.004	0.29 –0.05, +0.06	1.201 ± 0.161	8.44 ± 0.80	26.0 ± 2.5
	limiting	limiting	0.014 ± 0.004	0.20 –0.03, +0.04	1.086 ± 0.161	8.12 ± 0.80	24.5 ± 2.5
	Water effect		**20.81 $_{1, 30}$ *** **	**14.86 $_{1, 30}$ *** **	**8.25 $_{1, 30}$ ** **	**6.84 $_{1, 30}$ * **	**10.66 $_{1, 30}$ ** **
	Nutrient effect		1.74 $_{1, 30}$	0.05 $_{1, 30}$	2.97 $_{1, 30}$	**9.24 $_{1, 30}$ ** **	3.92 $_{1, 30}$
	*Water*nutrient*		4.00 $_{1, 30}$	3.50 $_{1, 30}$	**4.66 $_{1, 30}$ * **	**4.91 $_{1, 30}$ * **	**7.28 $_{1, 30}$ * **

Fall 2004-1							
H. annuus	sufficient	---	0.124 ± 0.020	0.61 ± 0.24	0.924 ± 0.151	18.86 ± 1.525	19.9 ± 1.8
	limiting	---	0.104 ± 0.019	1.35 ± 0.22	0.645 ± 0.141	14.53 ± 1.426	18.4 ± 1.7
H. anomalus	sufficient	---	0.119 ± 0.019	1.65 ± 0.23	0.771 ± 0.144	18.11 ± 1.426	18.9 ± 1.7
	limiting	---	0.134 ± 0.021	1.86 ± 0.25	0.635 ± 0.157	15.36 ± 1.647	21.2 ± 1.9
H. deserticola	sufficient	---	0.148 ± 0.019	1.88 ± 0.23	0.837 ± 0.145	16.57 ± 1.525	18.2 ± 1.8
	limiting	---	0.135 ± 0.018	1.80 ± 0.21	1.026 ± 0.136	18.66 ± 1.345	21.1 ± 1.6
H. petiolaris	sufficient	---	0.086 ± 0.019	1.14 ± 0.23	0.929 ± 0.144	18.30 ± 1.426	20.5 ± 1.7
	limiting	---	0.105 ± 0.021	1.44 ± 0.24	0.756 ± 0.155	16.23 ± 1.525	17.8 ± 1.8
	Nitrate effect		0.00 $_{1, 51}$	0.09 $_{1, 51}$	1.41 $_{1, 51}$	2.83 $_{1, 51}$	0.05 $_{1, 50}$
	Species effect		**3.08 $_{3, 51}$***	**3.03 $_{3, 51}$***	1.24 $_{3, 51}$	0.18 $_{3, 51}$	0.12 $_{3, 50}$
	*Nitrate*species*		0.76 $_{3, 51}$	0.79 $_{3, 51}$	1.46 $_{3, 51}$	1.77 $_{3, 51}$	1.28 $_{3, 50}$
	PAR (covariate)						**24.18 $_{1, 50}$*****
Fall 2004-2							
H. annuus	---	sufficient	0.060 ± 0.007	0.74 ± 0.08	1.489 ± 0.121	18.46 ± 1.37	32.04 ± 2.1
	---	limiting	0.022 ± 0.007	0.32 ± 0.08	0.365 ± 0.121	8.34 ± 1.37	18.5 ± 2.1
H. annuus Hopi	---	sufficient	0.053 ± 0.007	0.68 ± 0.08	1.029 ± 0.121	16.40 ± 1.37	25.2 ± 2.1
	---	limiting	0.029 ± 0.007	0.41 ± 0.09	0.243 ± 0.128	6.54 ± 1.45	14.2 ± 2.2
	Water effect		**17.64 $_{29, 1}$ *****	**16.77 $_{29, 1}$*****	**60.28 $_{29, 1}$*****	**51.82 $_{29, 1}$*****	**32.73 $_{29, 1}$*****
	Accession effect		0.0 $_{29, 1}$	0.02 $_{29, 1}$	5.57 $_{29, 1}$*	1.29 $_{29, 1}$	**6.83 $_{29, 1}$***
	*Water*accession*		0.92 $_{29, 1}$	0.81 $_{29, 1}$	1.88 $_{29, 1}$	0.01 $_{29, 1}$	0.34 $_{29, 1}$
Spring 2005							
H. annuus	sufficient	---	0.104 -0.012, +0.013	1.20 –0.14, +0.16	---	---	---
	limiting	---	0.082 -0.009, +0.01	0.98 –0.11, +0.13	---	---	---
	Nitrate effect		3.96 $_{1, 11}$	3.92 $_{1, 11}$	---	---	---
	Leaf age effect		0.83 $_{1, 321}$	0.57 $_{1, 321}$	---	---	---
Summer 2005							
H. annuus	sufficient	sufficient	0.079 -0.008, +0.009	0.55 -0.04, +0.05	---	---	---
	sufficient	limiting	0.027 ± 0.003	0.22 ± 0.02	---	---	---
	limiting	sufficient	0.096 -0.010, +0.011	0.61 ± 0.05	---	---	---
	limiting	limiting	0.034 -0.003, +0.004	0.27 ± 0.02	---	---	---
	Water effect		**93.88 $_{1, 31}$*****	**101.3 $_{1, 31}$*****	---	---	---
	Nitrate effect		3.57 $_{1, 31}$	2.98 $_{1, 31}$	---	---	---
	*Water*nitrate*		0.02 $_{1, 31}$	0.28 $_{1, 31}$	---	---	---
Fall 2005-1	sufficient;						

H. annuus	15.5 wks age sufficient;	---	0.037 -0.009, +0.011	0.50 -0.11, +0.14	---	---	---
	10 wks age sufficient;	---	0.037 -0.009, +0.012	0.49 -0.11, +0.15	---	---	---
	5.5 wks age limiting;	---	0.098 -0.023, +0.03	1.19 -0.26, +0.33	---	---	---
	15.5 wks age limiting;	---	0.054 -0.013, +0.017	0.72 -0.16, +0.20	---	---	---
	10 wks age limiting;	---	0.037 -0.009, +0.011	0.49 -0.11, +0.14	---	---	---
	5.5 wks age	---	0.153 -0.036, +0.047	1.76 -0.39, +0.50	---	---	---
	Nitrate effect		$2.39_{1,46}$	$2.25_{1,46}$	---	---	---
	Plant age effect		**$17.45_{2,46}$*** **	**$15.96_{2,46}$*** **	---	---	---
	*Nitrate*plant age*		$0.55_{2,46}$	$0.58_{2,46}$	---	---	---
Fall 2005-2							
H. annuus	---	sufficient	0.072 -0.021, +0.030	0.58 -0.16, +0.23	1.854 -0.345, +0.423	15.15 ± 0.29	34.9 ± 1.0
	---	limiting	0.003 ± 0.001	0.03 ± 0.01	0.019 -0.004, +0.005	0.60 ± 0.30	3.8 ± 1.1
	Water effect		**$38.55_{1,19}$*** **	**$38.01_{1,19}$*** **	**$236.96_{1,19}$*** **	**$1211.89_{1,19}$*** **	**$443.65_{1,19}$*** **