Plant Traits and Production Rates from CO2 Starvation to Saturation

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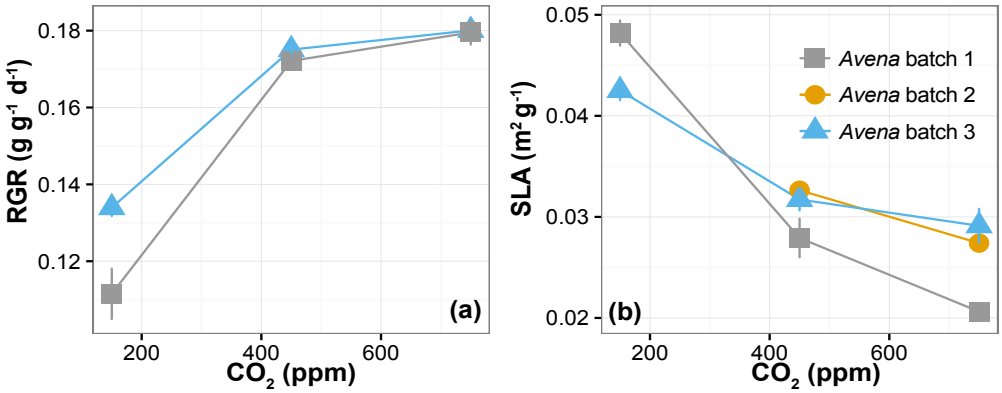
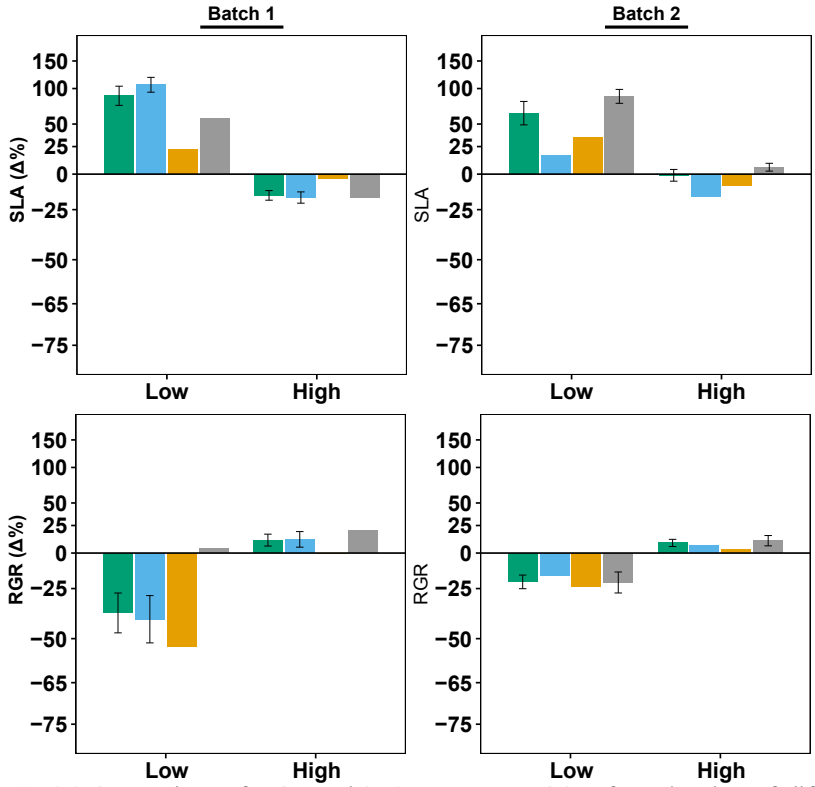
Appendix 2

Appendix table 2.1 Species grown for the experiment with their species name, family name and functional type. # replicates notes how much individuals of the species were harvested at final harvest for all three treatments.

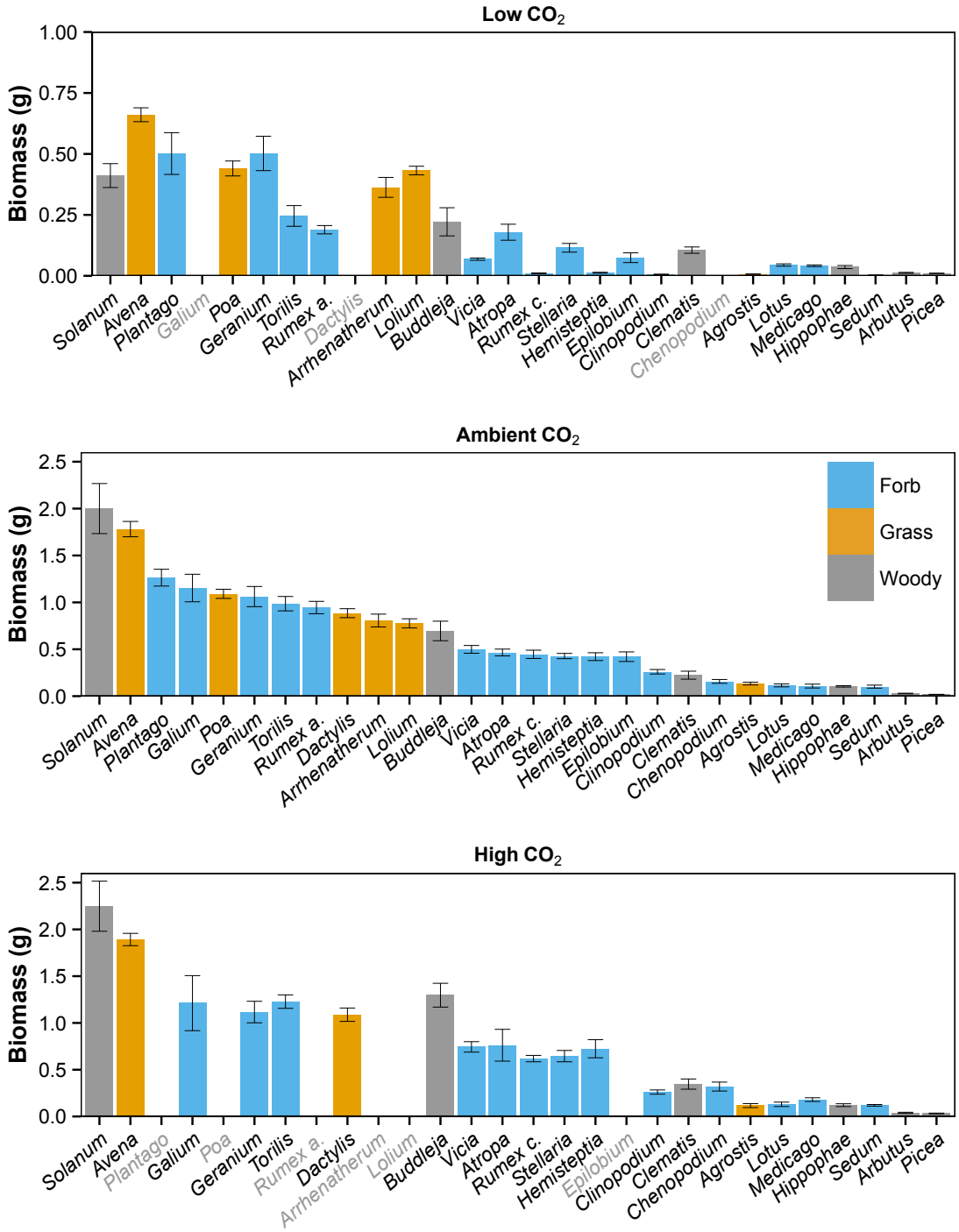
			# replicates		
Species name	**Family**	**Type**	**low CO_2**	**amb. CO_2**	**high CO_2**
Agrostis capillaris	Poaceae	grass	5	6	7
Arbutus unedo	Ericaceae	woody, tree	5	7	6
Arrhenatherum elatius	Poaceae	grass	8	9	x
Atropa belladonna	Solanaceae	forb	7	6	6
Avena sativa	Poaceae	grass	10	10	9
Buddleja davidii	Scrophulariaceae	woody, shrub	6	6	7
Chenopodium album	Amaranthaceae	forb	x	10	10
Clematis vitalba	Ranunculaceae	woody, shrub	4	5	5
Clinopodium chinense	Lamiaceae	forb	8	8	7
Dactylis glomerata	Poaceae	grass	x	10	9
Epilobium hirsutum	Onagraceae	forb	4	8	x
Galium aparine	Rubiaceae	forb	x	5	5
Geranium pratense	Geraniaceae	forb	6	6	6
Hemisteptia lyrata	Asteraceae	forb	7	7	8
Hippophae rhamnoides	Elaeagnaceae	woody, shrub	6	7	6
Lolium perenne	Poaceae	grass	10	10	x
Lotus corniculatus	Fabaceae	forb	5	9	8
Medicago lupulina	Fabaceae	forb	6	6	6
Picea sitchensis	Pinaceae	woody, tree	8	8	6
Plantago lanceolata	Plantaginaceae	forb	7	10	x
Poa annua	Poaceae	grass	10	10	x
Rumex acetosella	Polygonaceae	forb	4	10	x
Rumex chalepensis	Polygonaceae	forb	7	7	7
Sedum album	Crassulaceae	forb	5	8	7
Solanum dulcamara	Solanaceae	woody, shrub	7	7	6
Stellaria media	Caryophyllaceae	forb	7	7	7
Torilis scabra	Apiaceae	forb	5	6	6
Vicia sepium	Fabaceae	forb	8	8	7



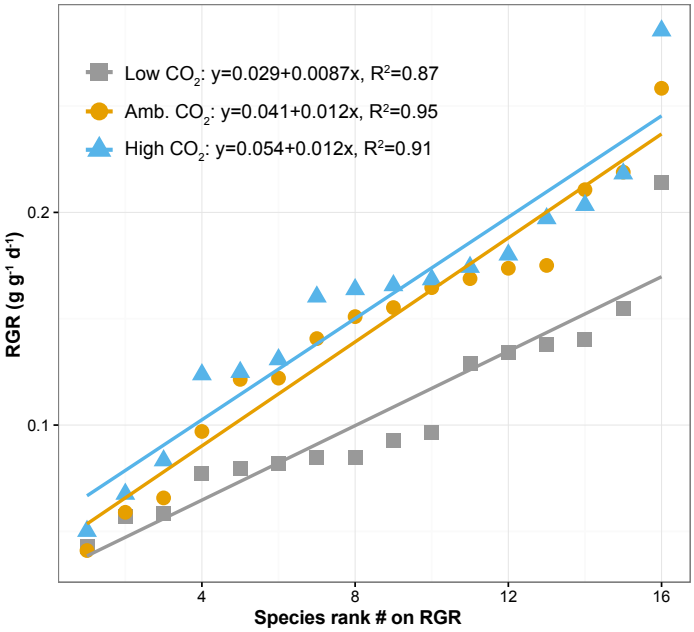
Appendix 2.1 Response of multiple batches of *Avena sativa* to CO_2 grown at different times during the experiment. **(a)** Relative growth rate (RGR), **(b)** specific leaf area (SLA). Plants in batch 1 were for a pilot experiment, batch 2 had missing low CO_2 data, batch 3 was used for the main results.



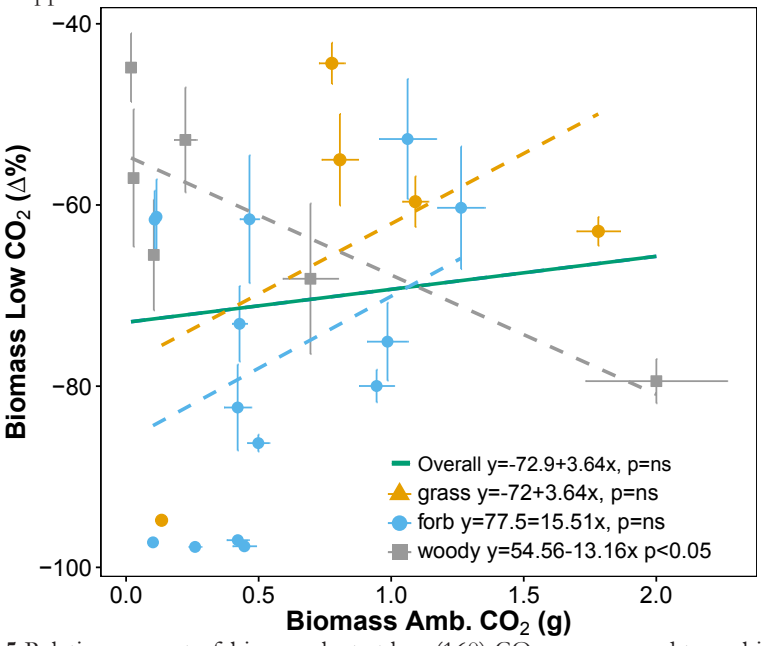
Appendix 2.2 Comparison of RGR and SLA response to CO_2 of two batches of different species grown at different times. Relative shift in trait level at low or high CO_2 compared to ambient CO_2 for forb, grass and woody species. Bars indicate percentage shift in trait value at low CO_2 (160 ppm) and high (750 ppm) CO_2 compared to trait value at ambient (450ppm) CO_2. Axes are natural log transformed so that the size of the bars at a 50% decrease or a 100% increase is the same (reflecting a factor 2 adjustment). Green bars: all species, blue bars: forb species, orange bars: grass species, grey bars: woody species. Error bars give SE if there are multiple species per type.



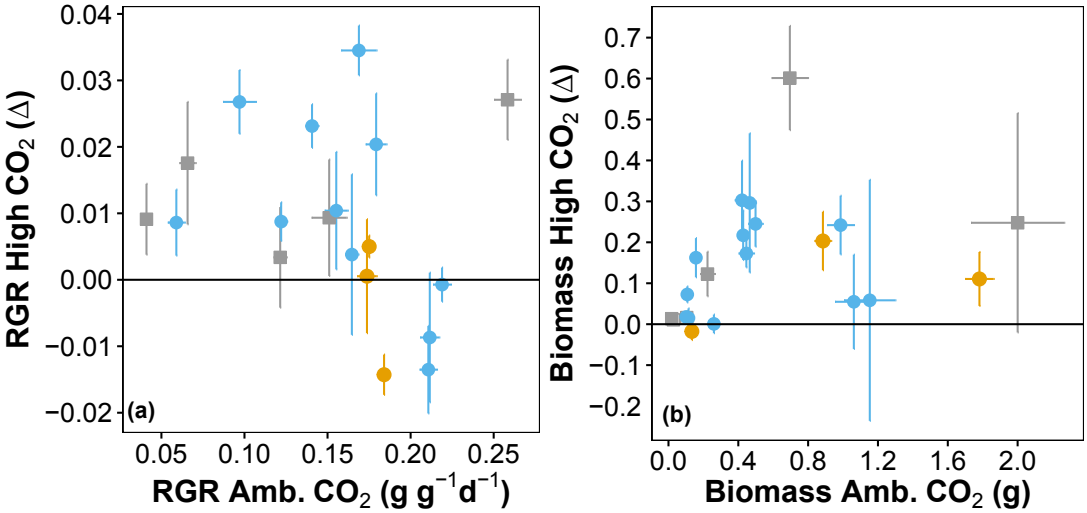
Appendix 2.3 Plant species biomass (g) ranking at 160 ppm, 450 ppm and 750 ppm CO_2. Species are ordered by RGR at 450 ppm CO_2. Light grey species names indicate species is missing at this CO_2 treatment. Note the different axis scale at low CO_2. Orange bars: grass species, blue bars: forb species, grey bars: woody species. Error bars denote SE.



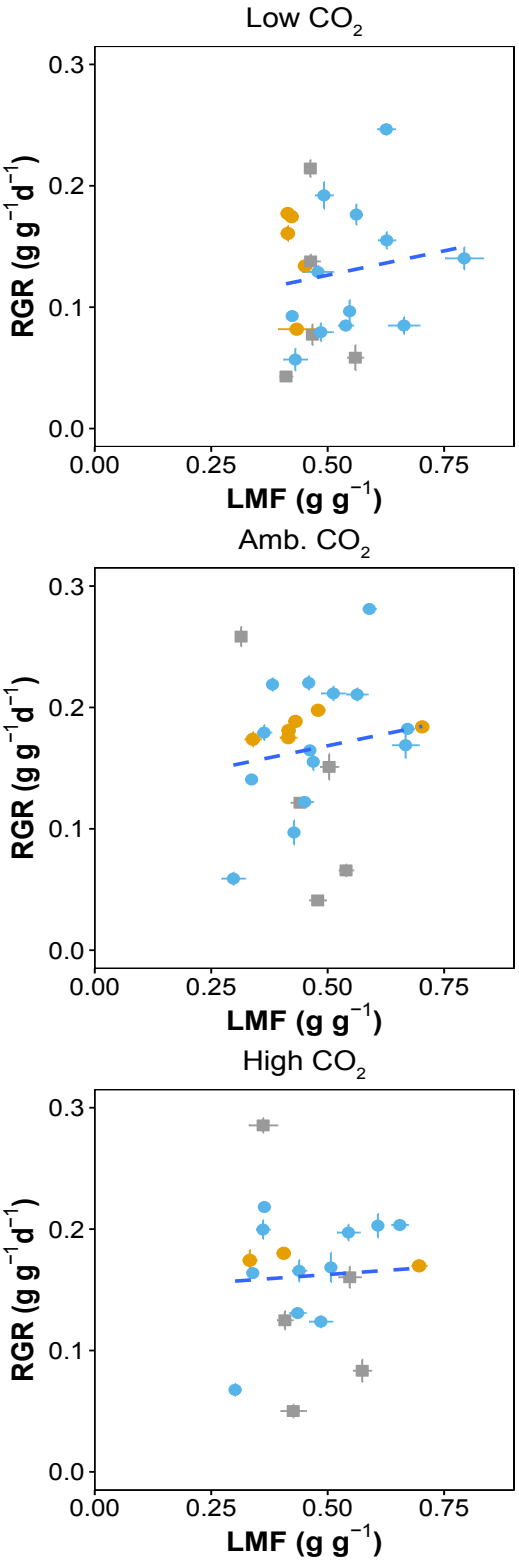
Appendix 2.4 Plant relative growth rate rank vs Relative Growth Rate at 160 ppm, 450 ppm and 750 ppm CO_2. Species are ordered by RGR from low to high at each CO_2 level. The slope between rank and RGR is significantly lower than the slopes at ambient and high CO_2 ($p<0.05$) which shows that the difference between the fastest and slowest grower is reduced. Orange: 450 ppm, Blue: 750 ppm, Grey: 160 ppm



Appendix 2.5 Relative amount of biomass lost at low (160) CO_2 as compared to ambient CO_2. Relative biomass difference (Δ%) at low CO_2 shows no relationship with biomass at ambient CO_2. Blue circles: forb species, orange triangles: grass species, grey squares: woody species, Black line: overall regression. Error bars give SE



Appendix 2.6 Difference in growth rate and plant biomass at future high (750 ppm) CO_2 compared to current ambient (450 ppm) CO_2. **(a)** Relative Growth Rate difference at low CO_2 shows no relationship to growth rate at ambient CO_2. **(b)** Biomass difference at low CO_2 shows no relationship with biomass at ambient CO_2. Blue circles: forb species, orange circles: grass species, grey squares: woody species. Error bars give SE



Appendix 2.7 Relationship between leaf mass fraction (LMF) and relative growth rate (RGR) at past low (160 ppm), current ambient (450 ppm) and future high (750 ppm) CO_2. No significant relationship between LMF and RGR was found. Points indicate species mean RGR and LMF with SE; Blue circles: forb species, orange circles: grass species, grey squares: woody species.