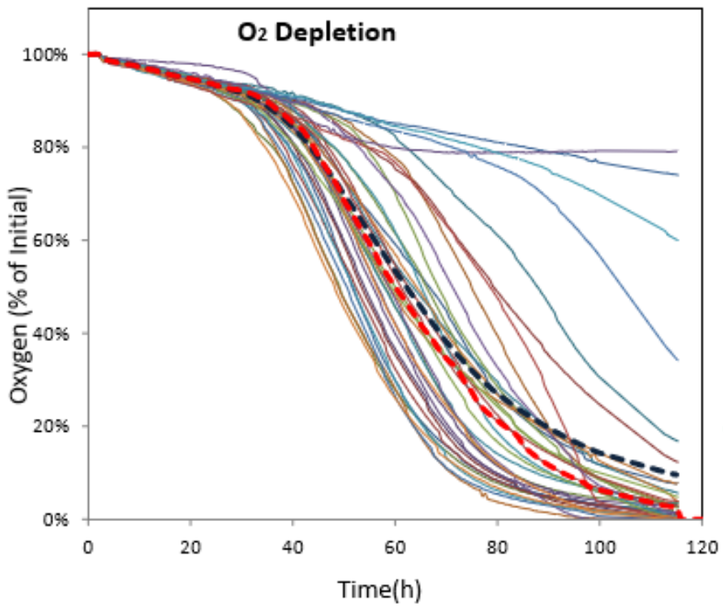
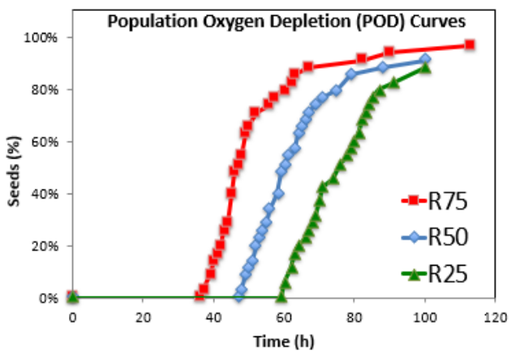
Seed Respiration Analyser (SRA)

Germination and Respiration Data Analyis

The SRA can support traditional seed testing, providing information unavailable through traditional means. The SRA has four discrete temperature zones, making it possible to easily compare germination and seed respiration responses to multiple temperature regimes. Easy to use SRA data analysis tools are freely available from UCDavis, Department of Plant sciences. The analysis software tool delivers automatically a results report as shown below.



O_2 depletion curves. Each line represents one single seed. The dashed lines are the avarage (black) and median (red) curves. After an intial period of low O_2 consumption, the seeds accelerate respriation (steep curve). The heterogeneity of het batch can be clearly seen.



R75 POD Curve – Values

		STDEV			STDEV
POD R75(50)	46.50	–	T90-10	35.25	–
Rate POD R75(50	2.15%	–	Final (%)	97%	–
R75	52.12	15.85	AUC75	45.32	13.19

R50 POD Curve – Values

		STDEV			STDEV
POD R50(50)	59.50	–	T90-10	44.50	-
Rate R50(50)	1.68%	–	Final (%)	91%	-
R50	62.16	11.892	AUC50	51.58	11.58

R25 POD Curve – Values

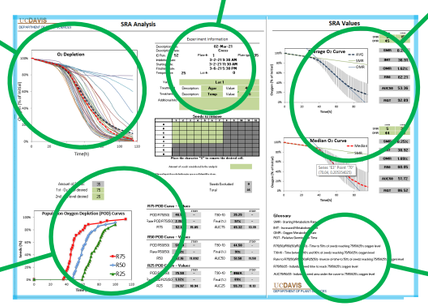
		STDEV			STDEV
POD R25(50)	75.50	–	T90-10	#N/A	-
Rate POD R25(50	1.32%	–	Final (%)	89%	-
R25	74.97	10.94	AUC25	55.79	11.13

Population O_2 Depletion (POD) curves showing the accumulation of the % of seeds reaching 75, 50 and 25 % O_2 level in the vial (from the O_2 single seed depletion curves). Steep lines (close together) represent represent high homogeneity. Table on the right shows diiferent parameter values and statistical information from the POD analysis

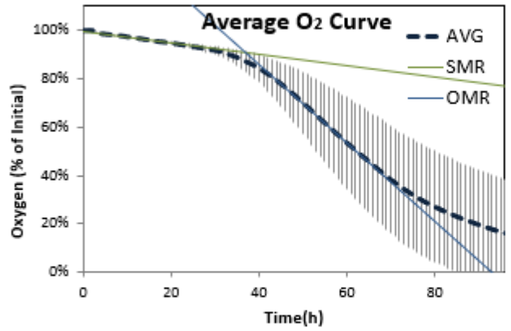
Experiment Information

Description Run:	02-Mar-21			
Description Plate:	Cress			
ID Run:	52	Plate #:	1	Plate type: 35
Imbibition date:	3-2-21 9:30 AM			
Starting date:	3-2-21 11:30 AM			
Finishing date:	3-6-21 5:30 PM			
Temperature:	25	Lot #:	0	

	Lot 1		
Variety			
Treatment 1	Description: Agar	Value:	400
Treatment 2	Description: Temp	Value:	25
Additional Info			



Results report



	x min	x max	
SMR	5	15	
OMR	45	60	
SMR	0.24		%/hr
IMT	36.91		hr
OMR	1.62		%/hr
R50	62.21		hr
AUC50	53.36		%.hr
RGT	92.89		hr

Average O_2 depletion curve (dashed line) with Standard Error of the Mean. In addition, several parameters derived from the O_2 depletion curve are given in the table (see glossary for explantion). SMR and OMR (start and maximal metabolism rate) are shown in the graph as well.

Glossary

SMR - Starting Metabolism Rate

IMT - Increased Metabolism Time

OMR - Oxygen Metabolism Rate

RGT - Relative Germination Time

R75(50)/R50(50)/R25(50) - Time to 50% of seeds reaching 75/50/25% oxygen level

T90-10 - Time between 10% and 90% of seeds reaching 75/50/25% oxygen level

Rate to R75(50)/R50(50)/R25(50) - Inverse of time to 50% of seeds reaching 75/50/25% oxygen level

R75/50/25 - Individual-seed time to reach 75/50/25% oxygen level

AUC75/50/25 - Individual-seed area under the curve to 75/50/25% oxygen level

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