2013

RIDEV USER MANUAL

Step by step guide on how to use RIDEV, along with several pointers regarding input file templates.

[Type the company name] 3/25/2013



THE INTERFACE

The Main Interface



The Simple Simulation Interface

IDEV / Help About Quit					
		Parameter I	Definition		
Meteo file name:	Load	.\METEO\Meteo_MADAGASCAR	SENEGAL.txt		
PSP computation mode:	 Linear	(i			
	Exponential				
	Delta PP				
	Impatience	L.			
Flooding:					
Transplanting:					
D Transplanting shock (in degree-days):	2				
	Ndiaye		-	-	
Latitude (in degrees N):	and the second se	Longitude (in degrees E):	16	Altitude (in meter): 5	
Sowing date (format DD/MM/YYYY):	1				
	250000				
PLA ini:	10000000				
LRGR Max:		TOpt (in celcius degree):	20		
TBase (in celcius degree): CritSterCold1 (in celcius degree):		CritSterCold2 (in celcius degree):	1	CritSterHeat (in celcius degree): 25	SterBase: 0
PPExp:		PPSens:	1000	PPCrit: 11.5	SeuilPP: 13.5
SumBVP (in degree-days):		SumRPR (in degree-days):	Provide a second	SumMatu (in degree-days): 400	
TOA (h before noon at 20C) :			0.8	LAI Max: 8	
	li in		11		
		Simula	tion		
		Start simulation	Reset values		
		Results			
wEndBVP: DSowPi:	1	Days from sowing to flowering:	D	ays from sowing to maturity:	AnthTimeMean:
11 sterility: Cold2 sterility:		Heat sterility:		Total sterility:	LAI Graph

The Multiple Simulation Interface:

74 RIDEV	
New Help About Quit	
Simulations setting file: Load\MULTI\multi_simulation_example.t	xt
Simulations result file: Save RIDEV_output\multi_simulation_res	ult.txt
Start simulations	

The Optimization Interface:

76 RIDEV New Help About Quit								-	
			Para	meter Definition					
Meteo file name:	Load	.\MET	EO\Meteo_MADAGASCAR_SENEGAL.txt						
Observation file name:	Load	.\OPT	T\Opti_SENEGAL_3vars.txt						
PSP computation mode:	Linear	æ							
	Exponential	С							
	Delta PP	С							
	Impatience	С							
	Optimize	Minir	mum Fixed	Maximum		Optimiz	e Minimum	Fixed	Maximum
TBase (in celcius degree):		5	10	15	TOpt (in celcius degree):	Г	20	30	35
CritSterCold1 (in celcius degree):	Γ	10	20	25	CritSterCold2 (in celcius degree):	Γ	10	20	25
CritSterHeat (in celcius degree):		20	35	40	SterBase:	Γ	0	0.2	1
PPExp:	F	0.1	0.2	1	PPSens:	Г	0.4	1	1.4
PPCrit:	Г		11.5		SeuilPP:	Г		13.5	
SumBVP (in degree-days):	Γ	250	600	1000	SumRPR (in degree-days):	Г		400	
SumMatu (in degree-days):	Г		400		TOA (h before noon at 20C) :	Г		0	
			Obs Days from sowing to flowering 🔽 D	erved variables Days from sowing to maturity	Total sterility				
				Outputs					
			Optimized values file:	Save\out_opti.txt					
			Simulations with Optimized values file:	Save\out_opti_simul.txt					
				Optimization					

FILES

INPUT FILE: Meteorology File

	А	В	С	D	E	F	G	н	1	J	K	L
1	CodeStation	Jour	Tmax	Tmin	Tmoy	HMax	HMin	НМоу	Vt	Ins	Rg	ETP
2	Ivory	01/01/2009	32.1	20.5		96	40		1.956019		27.85	6.389361
3	Ivory	02/01/2009	29.9	19.2		96	46		1.909722		31.94	6.562051
4	Ivory	03/01/2009	33.1	21.1		94.5	36		1.585648		26.56	6.205506
5	Ivory	04/01/2009	30.3	18.2		96	46		1.736111		22.58	5.155222
6	Ivory	05/01/2009	30.2	19.7		96	45.5		1.539352		27.28	5.815871
7	Ivory	06/01/2009	29.8	20.7		95.5	51.5		1.481481		18.17	4.323205
8	Ivory	07/01/2009	30.7	19		96	46.5		1.62037		31.34	6.457493
9	Ivory	08/01/2009	31.3	19.7		94.5	46		1.458333		23.7	5.346216
10	Ivory	09/01/2009	31.6	19.8		96	40		1.585648		24.8	5.677612
11	Ivory	10/01/2009	30.3	17.9		96	42		1.979167		33.7	6.970835

		_	
Figure 1 A Sample meteo	filo with co	rroct formatting	of data and headers
FIGULE T A SALLINE LITELED	THE WILLICO		UI UALA AIIU HEAUEIS

ALL Header names and character strings / text are case-sensitive , meaning "Ndiaye" will be regarded as a different site from "ndiaye", and "Variety_1" is of a different variety from "variety_1"; take special care in ensuring that the strings are in the exact same cases

CodeStation	CodeStation
Site_1	Site_1
site 1	Site_1

Figure 2 Station names on the left may produce errors, names on the right ensure that there is only one site considered

• The first column, "CodeStation" Lists the names for the available sites in the meteorology file.

• The "Jour" column refers to the day of the observations to be found in the corresponding row, it follows the format **dd/MM/YYYY**, this is usually found in time region EN-Australia. Using other formats MAY produce errors.

Jour	
01/01/2009	

• The next parameters are the observed data, some of these such as the "**Tmoy**" and "**HMoy**" (Temperature Mean and Humidity Mean respectively) can be skipped given that both "**Tmax**" and "**Tmin**" or "**HMax**" and "**HMin**" are both present since they can be derived from the two corresponding maxima and minima.

Tmax	Tmin	Tmoy	HMax	HMin	НМоу	Vt	Ins	Rg	ETP
32.1	20.5		96	40		1.956019		27.85	6.389361

INPUT FILE: Multiple Simulation Settings File

	A	В	С	D		E		F	G		4		l		J
1	Simulation	oiSite	Latitude	Longitud	de A	Altitude	PSPC	omputationMode	Flooding	Transpla	nting	DDTransplar	ntingShock	Sow	vingDate
2	Sim1	CINZANA	13.25		-7.56	319	Linea	ar	0		0		0	10/0	06/2009
3	Sim2	CINZANA	13.25		-7.56	319	Expo	nential	0		0		0	10/0	06/2009
4	Sim3	CINZANA	13.25		-7.56	319	Delta	PP	0		0		0	10/0	06/2009
5	Sim4	CINZANA	13.25		-7.56	319	Impa	tience	0		0		0	10/0	06/2009
	К	L	N	Λ	N	0)	р	Q			R	S		Т
PC		L Pl Aini				_				12	CritSte		SterBase		T
PC)P	L PLAini	LRGRM	lax	N TBase	TOpt		CritSterCold1	Q CritSterColo		CritSte	rHeat	S SterBase		T PPExp
PC		L PLAini 0.0001	LRGRM			_		CritSterCold1		12 10	CritSte			e 0.2	T PPExp 0.25
PC)P		LRGRM	lax		TOpt		CritSterCold1 18	CritSterCold		CritSte	rHeat	1		
PC)P 250000	0.0001	LRGRM	lax 1.15		TOpt 12	30	CritSterCold1 18 18	CritSterCold	10	CritSte	rHeat 33		0.2	0.25

U	V	W	X	Y	Z	AA		AB	AC	AD	AE	AF	AG	AH	AI	AJ
PPSens	PPCrit	SeuilPP	SumBVP	SumRPR	SumMatu	HrAnthBefNoon20C	Ζ		LAIMax	MeteoFile	eName					
0.3	11.5	13.5	400	400	400	11	L	0.8	6	D:\Projet	s Cirad\RID	EV\METEO	\Meteoro	logie_sorg	hum_test.t	txt
0.3	11.5	13.5	400	400	400	11	L	0.8	6	D:\Projet	s Cirad\RID	EV\METEO	\Meteoro	logie_sorg	hum_test.t	txt
0.3	11.5	13.5	400	400	400	11	L	0.8	6	D:\Projet	s Cirad\RID	EV\METEO	\Meteoro	logie_sorg	hum_test.t	txt
0.3	11.5	13.5	400	400	400	11	L	0.8	e	D:\Projet	s Cirad\RID	EV\METEO	\Meteoro	ogie_sorg	hum_test.t	txt

18

10

33

0.2

0.25

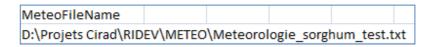
Figure 3 A full working sample of a properly formatted multiple simulation settings file

- Contains exactly the same information as the one found on the simple simulation interface plus the simulation name to identify runs ; as always, entries are CASE-SENSITIVE, the date formatting of EN-Au is also followed here (dd/MM/YYYY)
- The checkboxes from the interface are changed into "Boolean switches" here, meaning they take either a value of **1 (true, ticked)** or **0 (false, unticked)**



Figure 4 text file input (left) and interface equivalent (right)

• The "MeteoFileName" column must contain the full path to the file which will contain the simulation results for each row , it is better to use a filename which is not in use yet to avoid access privilege related errors such as read-only files.



250000

0.0001

1.15

12

30

HOW-TOs

How to run a simple simulation:

1.) From the main interface , choose 'New'



2.) Click on 'Simple Simulation', the simulation window should appear



3.) Load the Meteo File and fill up the simulation parameters window

Help About Quit							
			Parameter D	efinition			
Meteo file name:	Load						
PSP computation mode:	Linear	œ					
	Exponential	с					
	Delta PP						
	Impatience						
Flooding:							
Transplanting:	- 11						
D Transplanting shock (in degree-days):							
Site:							
Latitude (in degrees N): Sowing date (format DD/MM/YYYY):		Lon	gitude (in degrees E):		Altitude (in meter):		
POP:	· · · · · · · · · · · · · · · · · · ·						
PLA ini:	 [
LRGR Max:							
TBase (in celcius degree):		то	pt (in celcius degree):				
CritSterCold1 (in celcius degree):		CritSterCold	12 (in celcius degree):	1	CritSterHeat (in celcius degree):	SterBase:	
PPExp:			PPSens:		PPCrit:	SeuilPP:	
SumBVP (in degree-days):		Sum	RPR (in degree-days):		SumMatu (in degree-days):		
TOA (h before noon at 20C) :			Z:		LAI Max:		
			Simulat	ion	-		
			Start simulation	1			
			Start simulation	Neset values			
			Results				
EndBVP: DSowPi:	1	Days from so	wing to flowering:	D	ays from sowing to maturity:	AnthTimeMean:	
1 sterility: Cold2 sterility:			Heat sterility:	-	Total sterility:		LAI Graph

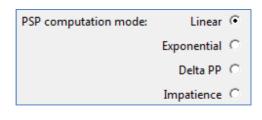
Figure 5 Empty Simulation Window

a.) Load the meteorology file; it should strictly follow the data format and header names like the one below

Α	В	С	D	E	F	G	Н	I	J	К	L
CodeStation	Jour	Tmax	Tmin	Tmoy	HMax	HMin	HMoy	Vt	Ins	Rg	ETP
Ivory	01/01/200	32.1	20.5		96	40		1.956019		27.85	6.389361
Ivory	02/01/200	29.9	19.2		96	46		1.909722		31.94	6.562051
Ivory	03/01/200	33.1	21.1		94.5	36		1.585648		26.56	6.205506
Ivory	04/01/200	30.3	18.2		96	46		1.736111		22.58	5.155222
Ivory	05/01/200	30.2	19.7		96	45.5		1.539352		27.28	5.815871

Table 1 Correct Formatting of a Meteo file

b.) Select the model you wish to use in the simulation





c.) Select whether the simulation includes Flooding and/or transplanting

Flooding:	
Transplanting:	

Figure 7 Transplanting / Flooding checkboxes

d.) Fill up the rest of the parameters

IDEV v Help About Quit						
		Parameter I	Definition			
Meteo file name:	Load	.\METEO\Meteo_MADAGASCAR				
			JEI IL OMEIONE			
PSP computation mode:						
	Exponential	10				
	Delta PP	· C				
	Impatience	C				
Flooding:	2					
- Transplanting:	F					
DD Transplanting shock (in degree-days):						
이번 이렇게 하는 것은 이렇게 하는 것이 가지 않는 것이 하는 것이 하는 것이 하는 것이 없다.	Ndiaye					
Latitude (in degrees N):		Longitude (in degrees E):	16	Altitude (in meter):	5	
Sowing date (format DD/MM/YYYY):	and the second s		4		3	
POP:	250000	-				
PLA ini:	0.0005					
LRGR Max:	1.2					
TBase (in celcius degree):	12	TOpt (in celcius degree):	30			
CritSterCold1 (in celcius degree):	18	CritSterCold2 (in celcius degree):	18	CritSterHeat (in celcius degree):	25	SterBase: 0
PPExp:	0.2	PPSens:	0.0001	PPCrit:	11.5	SeuilPP: 13.5
SumBVP (in degree-days):	St. 5. 2. 5. 5.	SumRPR (in degree-days):	Sec	SumMatu (in degree-days):	400	
TOA (h before noon at 20C) :	0	Z:	0.8	LAI Max:	8	
		Simula	tion			
		Start simulation				
			Neset values			
		Results				
owEndBVP: DSowPi:		Days from sowing to flowering:	D	lays from sowing to maturity:		AnthTimeMean:
d1 sterility: Cold2 sterility:		Heat sterility:	-	Total sterility:		LAI Grap

Figure 8 Filled-up Simulation Window

4.) Click on the Start simulation button located below the inputs, results will be displayed at the bottom frame almost instantaneously

		Parameter I	Definition		
Meteo file name	Load	D:/Projets Cirad/RIDEV/METEO/M	/leteo MADAG	ASCAR SENEGAL.txt	
PSP computation mode					
r si compatatori mede	Exponential				
	S				
	Delta PP				
	Impatience	C			
Flooding	V				
Transplanting					
Transplanting shock (in degree-days)	5				
Site	Ndiaye				
Latitude (in degrees N)	16	Longitude (in degrees E):	16	Altitude (in meter): 5	
Sowing date (format DD/MM/YYYY)	01/04/2009				
POP	250000				
PLA ini	0.0005				
LRGR Max	1.2				
TBase (in celcius degree)	12	TOpt (in celcius degree):	30		
CritSterCold1 (in celcius degree)	a Colora	CritSterCold2 (in celcius degree):		CritSterHeat (in celcius degree): 25	SterBase: 0
PPExp		PPSens:		PPCrit: 11.5	SeuilPP: 13.5
SumBVP (in degree-days)		SumRPR (in degree-days):		SumMatu (in degree-days): 400	
TOA (h before noon at 20C)	0	Z:	0.8	LAI Max: 8	
		Simula	tion		
		Start simulation	Reset values		
		Results			

Figure 9 Simulation Window With Results

5.) A Button with the label 'LAI Graph' will also be present, clicking this will display the progression of LAI during the progression of the days simulated, you can also save the LAI into a text file

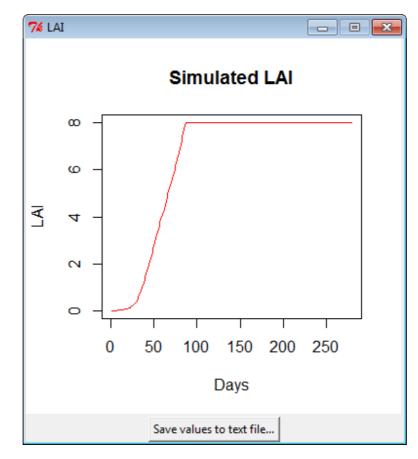
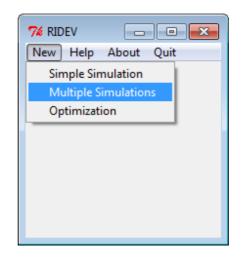


Figure 10 Graphical display of LAI progression

How to run a multiple simulation

1. Select 'New' -> 'Multiple Simulations' from the main interface



2. The multiple simulations interface will appear, simply load the simulations setting file and point to the location of the output to be produced

7∕ ∕ RIDEV	
New Help About Q	luit
Simulations setting file:	Load \MULTI\multi_simulation_example.txt
Simulations result file:	Save
	Start simulations

a.) Load the simulations setting file – the data should be in the correct format and character cases (like the example below)

	А	В		С		D		E		F		G			Н		1			J	
1	Simulati	o Site	Lá	atitude	Longitu	de	Altitu	ude	PSPComputationMod			Flooding		Transplanting		DDTran	DDTransplantingShock		SowingDate		
2	Sim1	CINZA	NA	13.25		-7.5	5	319	Linea	r			0)	0			() 10/	10/06/2009	
3	Sim2	CINZA	NA	13.25		-7.5	5	319	Expor	nential			0)	0			(0 10/0	06/2009	
4	Sim3	CINZA	NA	13.25		-7.5	5	319	Delta	PP			0)	0			(0 10/0	06/2009	
5	Sim4	CINZA	ANA	13.25		-7.5	5	319	Impat	tience			0)	0			(0 10/0	06/2009	
	к	L		N	1	N	1	C)	Р			Q			R		S		т	
POF	P	PLAin	i	LRGRM	lax	TBase	2	TOpt		CritSterCo	ld1	CritSter	Colo	d2	CritSte	rHeat		SterBase	2	PPExp	
2	250000	0.0	0001		1.15		12		30		18			10			33		0.2		0.25
2	250000	0.0	0001		1.15		12		30		18			10			33		0.2		0.25
2	250000		0001		1.15		12		30		18			10			33		0.2		0.25
2	250000	0.0	0001		1.15		12		30		18			10			33		0.2		0.25
	U	٧	W	X		Y	Z			AA	AB	AC		AD	AE	AF	AG	AH		AI	AJ
PPSe	ens PF	PCrit	SeuilPl	P SumB	VP Sum	RPR Su	ımMatı	u Hr	AnthBe	efNoon20C	Z	LAIMax	Me	eteoFileNa	me						
	0.3	11.5	1	3.5	400	400		400		11	().8 (5 D:\	Projets Ci	ad\RIDEV	\meteo\i	Veteo	rologie_sorg	hum_	test.txt	
	0.3	11.5	1	3.5	400	400		400		11	().8 (5 D:\	Projets Ci	ad\RIDEV	\METEO\I	Veteo	rologie_sorg	hum_	test.txt	
	0.3	11.5	1	3.5	400	400		400		11	().8 (5 D:\	Projets Ci	ad\RIDEV	METEO/I	Veteo	rologie_sorg	hum_	test.txt	
	0.3	11.5	1	3.5	400	400		400		11	().8 (5 D:\	Projets Ci	ad\RIDEV	METEO/I	Veteo	rologie_sorg	hum_	test.txt	

Table 2 Sample of Correct input format for Multiple Simulations

3. Click on the 'Start Simulations' button and after a while, if all goes well, you should see a message like the one below signaling the end of a successful multiple simulation; The results will be in the file you specified earlier in the interface



How to run an optimization

1. Select **'New' -> 'Optimization'** from the main interface



2. Load the Meteo file and target file, define the location of the outputs and fill-up the parameters windows accordingly, ticking the checkboxes beside parameters that you wish to optimize and the variables you wish to consider when fitting

New Help About Quit									
			Pa	rameter Definition					
Meteo file name:	Load								
Observation file name:	Load								
PSP computation mode:	Linear	Ģ							
	Exponential	C							
	Delta PP	C							
	Impatience	c							
	Optimize	Minimum	Fixed	Maximum		Optimize	Minimum	Fixed	Maximum
TBase (in celcius degree):	Г				TOpt (in celcius degree):				
CritSterCold1 (in celcius degree):	Γ				CritSterCold2 (in celcius degree):	Γ		<u> </u>	
CritSterHeat (in celcius degree):			[SterBase:	Γ			
PPExp:	E.				PPSens:				
PPCrit:	Г		[]		SeuilPP:	Г			
SumBVP (in degree-days):	Г				SumRPR (in degree-days):				
SumMatu (in degree-days):	Г		ļ,		TOA (h before noon at 20C) :	Г			
			0	bserved variables					
		Days from s	owing to flowering 🗖	Days from sowing to matur	ity 🔲 Total sterility 🗐				
				Outputs					
		Optimized v	alues file:	Save					
		Simulations	with Optimized values fi	le: Save \.\out_opti_simul.t	xt				
				Optimization					
				art! Reset parameters					

А	В	C		D		Е	F		G	Н	
Site	Latitude	Longitud	le Al	titude	Var	riety	Flooding	3.	Transplanting	DDTransplanti	ngShock
Ndiaye	13.25		-7.56	8		6		1	0		0
Ndiaye	13.25		-7.56	8		6		1	0		0
Ndiaye	13.25		-7.56	8		6		1	0		0
Ndiaye	13.25		-7.56	8		6		1	0		0
Ndiaye	13.25		-7.56	8		6		1	0		0
Ndiaye	13.25		-7.56	8		6		1	0		0
Ndiaye	13.25		-7.56	8		9		1	0		0
Ndiaye	13.25		-7.56	8		9		1	0		0
1	J	К	L	M			N		0	Р	Q
Z	LAIMax I	РОР	PLAini	LRGRN	lax	Sowing	Date	DA	S_Flowering	DAS_Maturity	SterTot
0.8	6	600000	0.000	1	1.2	07/02/2	009		107		
0.8	6	600000	0.000	1	1.2	07/03/2	009		95		
0.8	6	600000	0.000	1	1.2	07/04/2	009		104		
0.8	6	600000	0.000	1	1.2	17/07/2	009		70		
0.8	6	600000	0.000	1	1.2	17/09/2	009		74		
0.8	6	600000	0.000	1	1.2	19/10/2	009		88		
0.8	6	600000	0.000	1	1.2	07/02/2	009		85		
0.8	6	600000	0.000	1	1.2	07/03/2	009		76		

a.) Load the meteo file and the observation file, the format of the observation file should be like the one below

Table 3 Correct formatting and header names of an observation file

b.) Select the model of choice

PSP computation mode:	Linear	•
	Exponential	0
	Delta PP	0
	Impatience	0

c.) Tick the checkboxes of the parameters which you wish to optimize and provide the min and max range for each in their respective boxes, otherwise provide the fixed value for the parameter

	Optimize	Minimum	Fixed	Maximum
TBase (in celcius degree):				
Figure 11 Fix	ed parameter	r input display (min and max b	ooxes disabled)	
	Optimize	Minimum	Fixed	Maximum
TBase (in celcius degree):	\mathbf{V}			



d.) Select the observed variables you wish to consider when finding a fit for the parameters, at least one must be chosen at all times

Observed variables	
Days from sowing to flowering 🔲 Days from sowing to maturity 🔲 Tot	tal sterility 🔲

e.) Define the names of the output files (optimized parameters, simulated values from optimized parameters) and the folder wherein they will be saved

Outputs						
Optimized values file:	Save	.\out_opti.txt				
Simulations with Optimized values file:	Save	.\out_opti_simul.txt				

3. Click on the 'Start!' button located near the bottom of the interface, you should notice that the command line window will display messages notifying that the process of optimization is ongoing

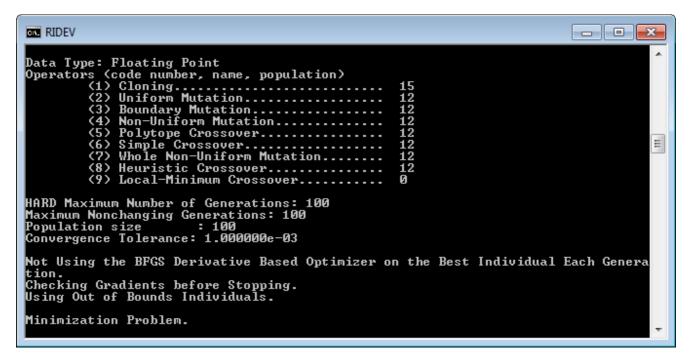


Figure 13 Command Line window while starting optimization on one variety

RIDEV	
var 1: best	<u>^</u>
GENERATION: 1 Fitness value 8.761660e+00 mean 1.049480e+01 variance 3.003769e+00 #unique 0, #Total UniqueCount: 2 var 1: best 9.098636e+00 mean 8.280976e+00 variance 6.685685e-01	Ξ
GENERATION: 2 Fitness value 8.761660e+00 mean 1.049480e+01 variance 3.003769e+00 #unique 0, #Total UniqueCount: 2 var 1: best 9.098636e+00 mean 8.280976e+00 variance 6.685685e-01	•

Figure 14 Command Line window while processing generations of each variety up to 100 generations per variety

RIDEV	
Fitness value 8.761660e+00 mean 1.049480e+01 variance 3.003769e+00 #unique 0, #Total UniqueCount: 2 var 1: best 9.098636e+00 mean 8.280976e+00	•
variance 6.685685e-01 Solution Fitness Value: 8.761660e+00	
Parameters at the Solution (parameter, gradient): X[1]: 9.098636e+00 G[1]:0.000000e+00	
Solution Found Generation 1 Number of Generations Run 2 Tue Feb 12 16:09:06 2013	
Total run time : 0 hours 1 minutes and 13 seconds	-

Figure 15 Command Line window displaying various statistics at the end of each optimization of a variety

4. Once it is done optimizing, a message will pop up and the results can be found at the directories you specified in the interface

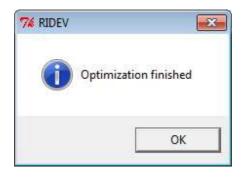


Figure 16 Optimization is done

BASIC TROUBLESHOOTING

Where will the errors be displayed?

Upon opening, a command line window will appear along with the RIDEV main interface, the initial display will be like the image below



Figure 17 Command Line window on newly opened RIDEV instance

Once RIDEV encounters an error, it will display an error message such as:

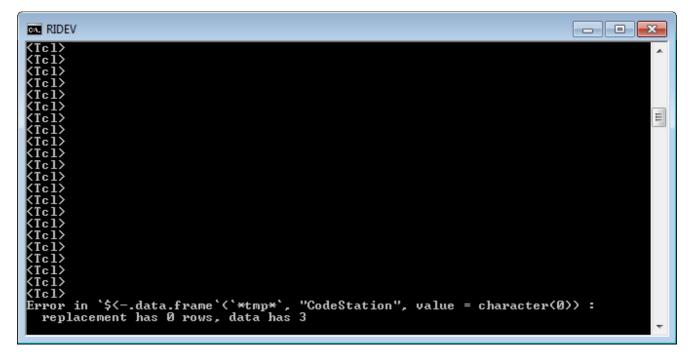


Figure 18 Command Line window once RIDEV encounters an error, displayed is a sample error message

List of Common Errors

Error in ridevSimulation.r(meteo, PSPComputationMode, Site, Flooding, : NA/NaN/Inf in foreign function call (arg 17)

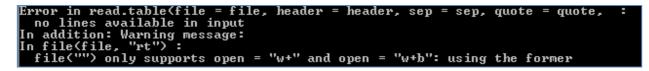
- 1. Missing value for a parameter / parameters in the simple simulation interface
- Fix : Look for and fill in missing parameter values

Error in `\$<-.data.frame`(`*tmp*`, "CodeStation", value = character(0)) : replacement has 0 rows, data has 3197

- 2. Error in input file, usually when the format is erroneous i.e. missing data header and rows for CodeStation usually occurs when simulation is being done
- Fix : Build a properly completed meteo input file

Error in positions[1]:positions[2] : NA/NaN argument

- 3. Error usually concerning dates , it may be one/some of the reasons stated below :
 - a.) Sowing date specified is not available in the meteo file
 - b.) Sowing date format does not follow dd/mm/yyyy format
 - c.) Duration of current simulation went over number of available dates of observed data
 - d.) Sowing date input is left blank
- Fix: check if the one or some of the errors above are present; if A, B, or D, simply fix the inputs; if C, consider getting additional observations to add to the meteo file or toggle the inputs in such a way that it will only simulate within the available dates



- 4. Usually comes from a missing meteo input file
- Fix : load a meteo file

```
Error in Domains[i, 1] <- -1 * default.domains : subscript out of bounds
```

- 5. No checkbox is ticked in the Optimization window, thus nothing to optimize
- Fix : Tick at least one checkbox / optimize at least one parameter

Error in if (is.na(observedValuesForInputTraitI)) next : argument is of length zero

- 6. No Observed Variable checkbox is ticked in the optimization window, thus no basis for fitting of selected parameters
- Fix : Tick at least one checkbox for the observed variables available

Error in genoud<fn = minimizationFunction, nvars = numberOfParametersToBeEstimat ed, : Domains[,1] must be less than or equal to Domains[,2]

- One or more of the range of values for a parameter has a min value which is larger than the max value (ex. min = 10, max = 9)
- Fix : Make sure the arrangement of values is correct, with Min < Max

Additional Usage Guidelines

a. For RIDEV in General

RIDEV accepts and produces tab delimited text (.txt) files , this means that the column contents are separated by a TAB (→) character, with each row ended by an ENTER (CRLF) at the end; This file type usually comes from and can be opened also by a spreadsheet program such as Excel for MSOffice and Calc for Ubuntu; furthermore, saving as a spreadsheet (.csv , .xlsx) and several other fomats is also possible once the data is opened in a spreadsheet

1	$\texttt{Site} \longrightarrow \texttt{Latitude} \longrightarrow \texttt{Longitude} \longrightarrow \texttt{Altitude} \longrightarrow \texttt{Variety} \\ \texttt{Flooding} \longrightarrow \texttt{Transplanting} \longrightarrow \texttt{DDTransplantingShock} \longrightarrow \texttt{Z}$
	$\texttt{Ndiaye} \rightarrow 13.25 \longrightarrow -7.56 \longrightarrow 8 \longrightarrow 1 \longrightarrow 1 \longrightarrow 0 \longrightarrow 0.8 \Rightarrow 6 \longrightarrow 600000 \rightarrow 0.0001 \rightarrow 1.2 \Rightarrow 07/02/2009 \rightarrow 116 \Rightarrow \longrightarrow 0.25 \texttt{CRLF}$
	$\texttt{Ndiaye} \rightarrow \texttt{13.25} \rightarrow \texttt{-7.56} \rightarrow \texttt{8} \rightarrow \texttt{1} \rightarrow \texttt{1} \rightarrow \texttt{0} \rightarrow \texttt{0} \rightarrow \texttt{0.8} \rightarrow \texttt{6} \rightarrow \texttt{6} \texttt{0} \texttt{0} \texttt{0} \texttt{0} \rightarrow \texttt{0} \texttt{.0001} \rightarrow \texttt{1.2} \rightarrow \texttt{07} / \texttt{03} / \texttt{2} \texttt{09} \rightarrow \texttt{107} \rightarrow \texttt{CRLE}$
	$\texttt{Ndiaye} \rightarrow 13.25 \longrightarrow -7.56 \longrightarrow 8 \longrightarrow 1 \longrightarrow 1 \longrightarrow 0 \longrightarrow 0 \dots 8 \rightarrow 6 \longrightarrow 600000 \rightarrow 0.0001 \rightarrow 1.2 \rightarrow 07/04/2009 \rightarrow 98 \rightarrow \dots 0.33 \texttt{CRLF}$
5	$\texttt{Ndiaye} \rightarrow \texttt{13.2} \\ \texttt{5} \rightarrow \texttt{-7.56} \rightarrow \texttt{8} \rightarrow \texttt{1} \rightarrow \texttt{1} \rightarrow \texttt{0} \rightarrow \texttt{0} \rightarrow \texttt{0.8} \\ \texttt{6} \rightarrow \texttt{600000} \rightarrow \texttt{0.001} \rightarrow \texttt{1.2} \\ \texttt{2} \\ \texttt{17} / \texttt{07} / \texttt{2009} \rightarrow \texttt{74} \rightarrow \longrightarrow \texttt{0.12} \\ \texttt{CRLF} \qquad \texttt{CRLF} \rightarrow \texttt{10} \\ $

Figure 19 Proper Tab delimited text formatting, all symbols shown for visualization

 Primary inputs such as the Meteo file, Multiple simulations settings file, etc. can be made or edited on a spreadsheet and later on saved as tab delimited text for use with RIDEV

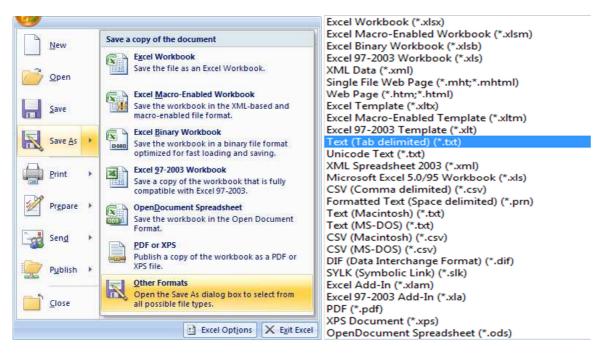


Figure 20 Saving a spreadsheet as a tab delimited text file

b. Simulation Results from Optimized Parameters

 The output of RIDEV, specifically the simulation results from the optimized parameters may contain erroneous results such as flowering, PI, maturity, etc. taking too long before happening (ex. Values >300 when it should be <100); We pinpointed the cause of this problem to choosing an observed variable which is not in the direct scope of the parameters being optimized, for example:

	Optimize	Minin	um Fixed	Maximum		Optimiz	e Minimum	i Fixed	Maximum			
TBase (in celcius degree):	V	5	10	15	TOpt (in celcius degree):	$\overline{\checkmark}$	20	30	35			
CritSterCold1 (in celcius degree):		10	20	25	CritSterCold2 (in celcius degree):	Γ	10	20	25			
CritSterHeat (in celcius degree):		20	35	40	SterBase:		0	0.2	1			
Observed variables												
			Days from sowing to flowering 🔽	Days from sowing to maturity	Total sterility							

Figure 21 Sample of an optimization setup that will most likely yield erroneous results

Fig. 21 shows an optimization setup not involving sterility parameters, but Total Sterility is among the chosen observed variables; This will lead to errors in the calculation as it will also try to fit the sterility using the forced values, observed variables with static parameters will lead to a difficult and less accurate fitting, therefore it is advised to take note of the parameters you wish to optimize and only include observed variables which will be of use in the optimization. Generally, when optimizing phenological parameters we can consider both 'days from sowing to flowering' and 'days from sowing to maturity', while for sterility related parameters, we consider 'Total Sterility'. It is also noted that considering days from sowing to maturity without actually optimizing maturity related parameter 'SumMatu' caused problematic results. To summarize, for best results it is recommended that the observed values to be taken into consideration be related or used by the parameters chosen to be optimized.

c. Scope of available Meteorological Data file

- The meteo file is the most important file in RIDEV, it is recommended that the observed data inside the file span several years; If data is scarce, the user must be sure that the number of days to be considered starting from the sowing date to be used (**offset**) when running simulations will not go over the available observation dates.

For example: if the sowing date of the simulation is February 13, 2013, the data inside the meteo file must have observations up until September 7, 2013 (**at least**) since this is **200 days from the sowing date** which is the minimum span of sowing to maturity for usual cases of simulation, but as for experimental cases it is of course recommended that the data contains much more than the minimum, 500 offset or more to be safe.