

ANNEXES

Annexe 1 : Protocole de préparation des milieux de cultures PDA, YMA, PDB et des tubes PDA

Recette Potato Dextrose Agar (PDA):

- 1) Prendre un erlen de 500 ml
- 2) Remplir l'erlen avec 13,65 g de PDA (39 g PDA/1l d'eau déminéralisée)
- 3) Ajouter 350 ml d'eau déminéralisée
- 4) Mélanger pour faciliter la dissolution des granules
- 5) Recouvrir de ouate et de papier aluminium
- 6) Placer à l'autoclave

Préparation d'une boîte PDA :

- 1) A la sortie de l'autoclave, placer erlen au bain marie (50 -55°C) pour refroidir le milieu
- 2) En chambre stérile, couler le milieu PDA dans les boîtes de Pétri (25-30 boîtes/erlen)
- 3) Laisser reposer pendant 24 heures
- 4) Placer à 4°C pour conserver les milieux PDA

Recette Yeast Malt Agar (YMA):

- 1) Prendre un erlen de 500 ml
- 2) Remplir l'erlen avec 1,4 g de Malt Extract, 1,4 g de Yeast Extract, 1,4 g de Sucrose et 5,25 g d'agar industriel
- 3) Ajouter 350 ml d'eau déminéralisée
- 4) Mélanger pour faciliter la dissolution des granules
- 5) Recouvrir de ouate et de papier aluminium
- 6) Placer à l'autoclave

Préparation d'une boîte YMA :

- 1) A la sortie de l'autoclave, placer erlen au bain marie (50 -55°C) pour refroidir le milieu
- 2) En chambre stérile, couler le milieu YMA dans les boîtes de Pétri (25-30 boîtes/erlen)
- 3) Laisser reposer pendant 24 heures
- 4) Placer à 4°C pour conserver les milieux YMA

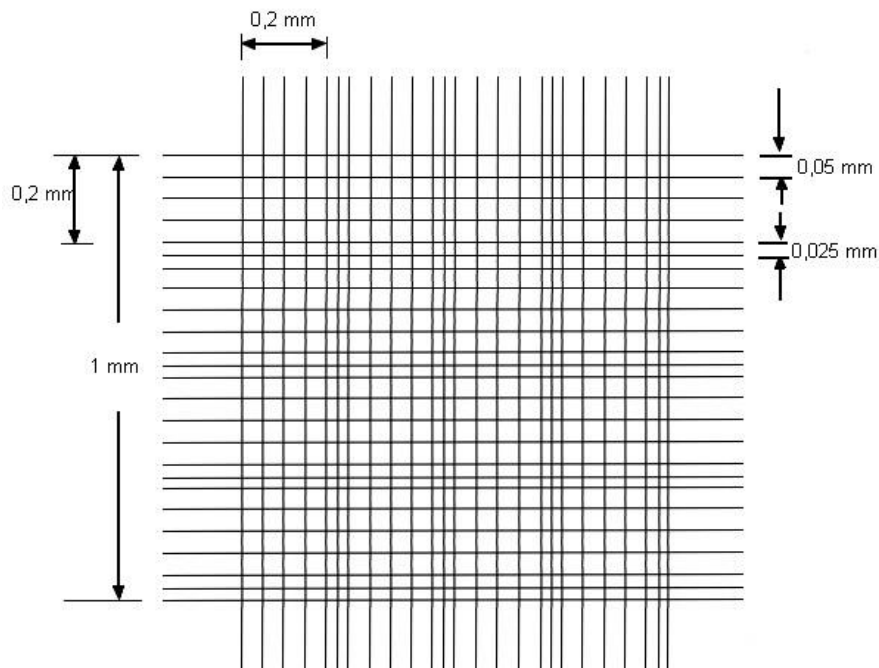
Préparation des tubes PDA :

- 1) Pour 6 tubes de milieu, ajouter 1,95 g de PDA et 50 ml d'eau déminéralisée dans un erlen
- 2) Mettre l'erlen au micro-ondes, chauffer jusqu'à ébullition et retirer l'erlen du micro-ondes
- 3) Mélanger pour faciliter la dissolution
- 4) Prendre une seringue réglée sur 6 ml
- 5) Remplir les tubes de milieu de culture avec 6 ml de milieu PDA
- 6) Recouvrir chaque tube de ouate et recouvrir l'entièreté des tubes avec du papier d'aluminium
- 7) Mettre le panier contenant les tubes à l'autoclave
- 8) A la sortie de l'autoclave et après un refroidissement via le bain marie, placer les tubes sur un portoir en métal, de façon légèrement inclinée.
- 9) Laisser reposer pendant 24 heures
- 10) Placer à 4°C pour conserver les tubes de milieu PDA

Recette Potato Dextrose Broth (PDB):

- 1) Prendre un erlen de 500 ml
- 2) Remplir l'erlen avec 8,4 g de PDB
- 3) Ajouter 350 ml d'eau déminéralisée
- 4) Mélanger pour faciliter la dissolution des granules
- 5) Recouvrir de ouate et de papier aluminium
- 6) Placer à l'autoclave
- 7) A la sortie de l'autoclave, conserver l'erlen en chambre stérile

Annexe 2 : Technique de comptage de conidies : Principe de la cellule de THOMA



Paramètres de la cellule :

- une surface élémentaire (1 petit carré dans un des 16 grands carrés) = $0,05 \text{ mm} * 0,05 \text{ mm}$
 $= 0,0025 \text{ mm}^2$

- profondeur cellule = 0,1 mm

→ Volume élémentaire = $0,0025 \text{ mm}^2 * 0,1 \text{ mm} = 0,00025 \text{ mm}^3 = 2,5 * 10^{-7} \text{ ml}$

Abaque :

Le volume total observé est fonction du nombre **A** de volumes élémentaires parcourus

$$\rightarrow V_{\text{total}} = 2,5 * 10^{-7} * A \text{ ml} \quad \text{avec } 1 < A < 256$$

A (1)	Volume parcouru (ml) (2)	Facteur multiplicatif pour exprimer le nombre d'objets dans 1 ml (3) = (1) / (2)
16 (1 carré)	$4 * 10^{-6}$	250000
32 (2 carrés)	$8 * 10^{-6}$	125000
64 (4 carrés)	$16 * 10^{-6}$	62500
80 (5 carrés)	$2 * 10^{-5}$	50000
160 (10 carrés)	$4 * 10^{-5}$	25000
256 (16 carrés)	$6,4 * 10^{-5}$	15625

Annexe 3 : Protocole de dilution des fongicides

	Pro/teb/flux	Fluo					
Stock mg/ml	40	100	Nombre de souche	# plaque	# lignes	avec perte	
Dilution 1	10x	25x	20	1,66666667	2	48	52,8 20

Volume pour 2 plaques / dilution

8000 7920

Volume de dilution 1 nécessaire

80 79,2

Volume de dilution 1 à préparer

160 158,4

Pro/teb/flux	volume de stock		volume solvant (DMSO)		volume tot	reste	dilution	cc mg/ml	cc milieu final mg/l	Correspond à
dilution 1	16		144		160	80	10	4	30	Falcon 1 (15ml)
dilution 2	53,3333333		106,666667		160	106,667	3	1,33333333	10	Falcon 2 (15ml)
dilution 3	53,3333333		106,666667		160	106,667	3	0,44444444	3,33333333	Falcon 3 (15ml)
dilution 4	53,3333333		106,666667		160	106,667	3	0,14814815	1,11111111	Falcon 4 (15ml)
dilution 5	53,3333333		106,666667		160	106,667	3	0,04938272	0,37037037	Falcon 5 (15ml)
dilution 6	53,3333333		106,666667		160	106,667	3	0,01646091	0,12345679	Falcon 6 (15ml)
dilution 7	53,3333333		106,666667		160	106,667	3	0,00548697	0,04115226	Falcon 7 (15ml)

Fluo	volume de stock		volume solvant (DMSO)		volume tot	reste	dilution	cc mg/ml	cc milieu final mg/l	Correspond à
dilution 1	6,4		153,6		160	80	25	4	30	Falcon 1 (15ml)
dilution 2	53,3333333		106,666667		160	106,667	3	1,33333333	10	Falcon 2 (15ml)
dilution 3	53,3333333		106,666667		160	106,667	3	0,44444444	3,33333333	Falcon 3 (15ml)
dilution 4	53,3333333		106,666667		160	106,667	3	0,14814815	1,11111111	Falcon 4 (15ml)
dilution 5	53,3333333		106,666667		160	106,667	3	0,04938272	0,37037037	Falcon 5 (15ml)
dilution 6	53,3333333		106,666667		160	106,667	3	0,01646091	0,12345679	Falcon 6 (15ml)
dilution 7	53,3333333		106,666667		160	106,667	3	0,00548697	0,04115226	Falcon 7 (15ml)

Annexe 4 : Script 'R Studio' pour le traitement des mesures d'absorbances en valeurs EC₅₀ correspondantes

```

1
2 #definir le working directory
3 setwd("nomduworkingdirectoryàpartirduquelontéléchargelesfichiers")
4
5 #####
6 #####Construction de la matrice#####
7 #####
8
9 #importer les deux fichiers "replicat technique"
10 a<-read.table("nomdufichierissudupremierpassage.txt",header=FALSE,sep="")
11 b<-read.table("nomdufichierissududeuxième passage.txt",header=FALSE,sep="")
12
13 #joindre les deux fichiers (superposer)
14 mat<-rbind(a[,2:13],b[,2:13])
15
16 #retirer la valeur des blancs
17 mat2<-mat[,2:12]-mat[,1]
18
19 #diviser chaque valeur par celle des témoins positifs
20 mata<-as.matrix(mat2[1:8,])
21 matb<-as.matrix(mat2[9:16,])
22 mata<-t(t(mata[1:7,])/mata[8,])
23 matb<-t(t(matb[1:7,])/matb[8,])
24 mat3<-rbind(mata,matb)
25
26 #ajouter un vecteur de concentration de fongicide
27 conc<-c(30,10,3.3,1.1,0.37,0.123,0.04)
28 mat4<-cbind(conc,mat3)
29 mat5<-as.data.frame(mat4)
30 #colnames(mat5)<-c("écrire", "les", "noms", "des", "souches", "dans", "l'ordre")
31
32 #####
33 #####calcul EC50  $Y = c + (d - c / 1 + \exp(b(\log x - \log e)))$ #####
34 #####
35
36 library(drc) ##regression logisitique
37 library(doby) ##pour les écarts type
38
39
40 par(mfrow=c(3,4))
41
42 fullec<-c()
43 for (i in 2:12)
44 {
45   souche<-mat5[,i]
46   #temp<-as.data.frame(cbind(conc,souche))
47   testEC <- drm(souche ~ conc, data = mat5, fct = LL.4())
48
49
50   b<- testEC$fit$par[1]
51   c<- testEC$fit$par[2]
52   d<- testEC$fit$par[3]
53   e<- testEC$fit$par[4]
54   valeur<-((((d-c)/(0.5-c))-1)^(1/b))*e
55   dat<-c(valeur,b,c,d,e)
56   fullec<-rbind(fullec,dat)
57
58
59 #mise en place du graphique
60
61
62 plot(testEC, pch=19, main=colnames(mat5[i]),ylab="growth")
63
64 moy<-summaryBy(souche~conc, data=mat5, FUN=c(mean, sd))
65 x<- moy$conc
66 y<- moy$souche.mean
67 sd1<-moy$souche.sd
68 segments(x,y-sd1,x,y+sd1)
69 segments(x,y-sd1,x,y+sd1)
70
71 }
72 dev.copy(png, 'nomdunouveaufichier.png')
73 dev.off()
74
75 colnames(fullec)<-c("ec50","b","c","d","e")
76 #rownames(fullec)<-c("écrire", "les", "noms", "des", "souches", "dans", "l'ordre")
77
78 write.table(fullec, "nomdunouveaufichier.txt", sep="\t")
79
80

```

Annexe 5 : Protocole d'extraction d'ADN via la technique d'extraction CTAB et de préparation du tampon CTAB nécessaire pour l'extraction d'ADN à partir du protocole CTAB

Etapes du protocole CTAB :

- 1) Le mycélium frais des souches à analyser est placé dans des tubes 2 ml + billes
- 2) Ajouter 500 µl de Tampon CTAB
- 3) Broyer le matériel à extraire à l'aide du Fast Prep à la vitesse 6 pendant 40 secondes
- 4) Incuber pendant 10 minutes à 42°C
- 5) Incuber pendant 10 minutes à 60°C
- 6) Ajouter 500 µl de solution chloroforme : alcool isoamylique (24 :1)
- 7) Vortexer jusqu'à l'apparition d'une émulsion
- 8) Incuber pendant 10 minutes sur glace
- 9) Centrifuger pendant 10 minutes à 13000 rpm et à température ambiante
- 10) Récupérer le surnageant (+/- 500 µl) et transférer celui-ci dans un nouveau tube de 1,5 ml
- 11) Ajouter 194 µl de PEG 30%
- 12) Ajouter 100 µl de NaCl 5M
- 13) Mixer en inversant 5 fois le tube et centrifuger pendant 15 minutes à 13000 rpm et à température ambiante
- 14) Eliminer le surnageant sans déranger le culot
- 15) Ajouter 100 µl d'éthanol 70% glacial pour rincer le culot
- 16) Enlever l'éthanol en inversant le tube
- 17) Passer les tubes au Speed-Vac pendant minimum 15 minutes
- 18) Redissoudre le culot dans 25 µl d'eau biomol

Recette du tampon CTAB :

- 10mM de Tris
- 20mM de EDTA
- 0,02M CTAB
- 0, M NaCl
- 0,03M N-Laurylsarcosine
- 0,1 M Sorbitol
- 1% PVP
- pH = 8 en ajoutant du NaOH

Ajouter au tampon CTAB :

- 10 µl de β-mercaptoéthanol
- 1 µl de protéinase K (20 ng/µl)

Préparation de 500 µl de tampon CTAB :

- 5 ml de Tris 1M
- 20 ml de EDTA 0,5M
- 3,64 g de CTAB
- 23,376 g de NaCl

- 11,84 g de Sorbitol
- 4,401 g de N-Laurylsarcosine
- 5 g de PVP

Solutions à faire en plus : - PEG 30% → PEG 8000

- NaCl 5M

- Solution chloroforme : alcool isoamylique → 24 volume de chloroforme pour 1 volume d'alcool isoamylique

Abréviations :

- Tris : trishydroxyméthylaminométhane
- EDTA : éthylènediaminetétraacétique
- CTAB : cetyl trimethylammonium bromide (EN)
- PVP : polyvinylpolypyrrolidone
- PEG : polyéthylène glycol
- NaCl : chlorure de sodium

Annexe 6 : Liste des souches de *Z. tritici* isolées en 2017 à partir du champ situé à Thy-le-Château

Year	Treatment	Field code	Field	Strain #	Code	Repetition
2017	TE	T	Thy-le-Château	1	17TET1	1
2017	TE	T	Thy-le-Château	3	17TET3	1
2017	TE	T	Thy-le-Château	5	17TET5	1
2017	TE	T	Thy-le-Château	6	17TET6	1
2017	TE	T	Thy-le-Château	7	17TET7	1
2017	TE	T	Thy-le-Château	8	17TET8	1
2017	TE	T	Thy-le-Château	9	17TET9	1
2017	TE	T	Thy-le-Château	10	17TET10	1
2017	TE	T	Thy-le-Château	11	17TET11	1
2017	TE	T	Thy-le-Château	12	17TET12	1
2017	TE	T	Thy-le-Château	14	17TET14	1
2017	TE	T	Thy-le-Château	15	17TET15	1
2017	TE	T	Thy-le-Château	2	17TET2	2
2017	TE	T	Thy-le-Château	3	17TET3	2
2017	TE	T	Thy-le-Château	4	17TET4	2
2017	TE	T	Thy-le-Château	5	17TET5	2
2017	TE	T	Thy-le-Château	7	17TET7	2
2017	TE	T	Thy-le-Château	8	17TET8	2
2017	TE	T	Thy-le-Château	9	17TET9	2
2017	TE	T	Thy-le-Château	10	17TET10	2
2017	TE	T	Thy-le-Château	11	17TET11	2
2017	TE	T	Thy-le-Château	12	17TET12	2
2017	TE	T	Thy-le-Château	13	17TET13	2
2017	TE	T	Thy-le-Château	14	17TET14	2
2017	TE	T	Thy-le-Château	15	17TET15	2
2017	TE	T	Thy-le-Château	16	17TET16	2
2017	TE	T	Thy-le-Château	1	17TET1	3
2017	TE	T	Thy-le-Château	3	17TET3	3
2017	TE	T	Thy-le-Château	4	17TET4	3
2017	TE	T	Thy-le-Château	5	17TET5	3
2017	TE	T	Thy-le-Château	6	17TET6	3
2017	TE	T	Thy-le-Château	7	17TET7	3
2017	TE	T	Thy-le-Château	9	17TET9	3
2017	TE	T	Thy-le-Château	10	17TET10	3
2017	TE	T	Thy-le-Château	11	17TET11	3
2017	TE	T	Thy-le-Château	12	17TET12	3
2017	TE	T	Thy-le-Château	13	17TET13	3
2017	TE	T	Thy-le-Château	14	17TET14	3
2017	TE	T	Thy-le-Château	15	17TET15	3
2017	TE	T	Thy-le-Château	16	17TET16	3
2017	TE	T	Thy-le-Château	2	17TET2	4
2017	TE	T	Thy-le-Château	3	17TET3	4
2017	TE	T	Thy-le-Château	4	17TET4	4
2017	TE	T	Thy-le-Château	6	17TET6	4
2017	TE	T	Thy-le-Château	7	17TET7	4
2017	TE	T	Thy-le-Château	8	17TET8	4

2017	TE	T	Thy-le-Château	9	17TET9	4
2017	TE	T	Thy-le-Château	10	17TET10	4
2017	TE	T	Thy-le-Château	11	17TET11	4
2017	TE	T	Thy-le-Château	13	17TET13	4
2017	TE	T	Thy-le-Château	14	17TET14	4
2017	TE	T	Thy-le-Château	15	17TET15	4
2017	TE	T	Thy-le-Château	16	17TET16	4
2017	T1	T	Thy-le-Château	1	17T1T1	1
2017	T1	T	Thy-le-Château	2	17T1T2	1
2017	T1	T	Thy-le-Château	3	17T1T3	1
2017	T1	T	Thy-le-Château	4	17T1T4	1
2017	T1	T	Thy-le-Château	5	17T1T5	1
2017	T1	T	Thy-le-Château	6	17T1T6	1
2017	T1	T	Thy-le-Château	7	17T1T7	1
2017	T1	T	Thy-le-Château	9	17T1T9	1
2017	T1	T	Thy-le-Château	10	17T1T10	1
2017	T1	T	Thy-le-Château	11	17T1T11	1
2017	T1	T	Thy-le-Château	13	17T1T13	1
2017	T1	T	Thy-le-Château	15	17T1T15	1
2017	T1	T	Thy-le-Château	1	17T1T1	2
2017	T1	T	Thy-le-Château	2	17T1T2	2
2017	T1	T	Thy-le-Château	3	17T1T3	2
2017	T1	T	Thy-le-Château	4	17T1T4	2
2017	T1	T	Thy-le-Château	5	17T1T5	2
2017	T1	T	Thy-le-Château	6	17T1T6	2
2017	T1	T	Thy-le-Château	7	17T1T7	2
2017	T1	T	Thy-le-Château	8	17T1T8	2
2017	T1	T	Thy-le-Château	9	17T1T9	2
2017	T1	T	Thy-le-Château	10	17T1T10	2
2017	T1	T	Thy-le-Château	12	17T1T12	2
2017	T1	T	Thy-le-Château	13	17T1T13	2
2017	T1	T	Thy-le-Château	14	17T1T14	2
2017	T1	T	Thy-le-Château	15	17T1T15	2
2017	T1	T	Thy-le-Château	16	17T1T16	2
2017	T1	T	Thy-le-Château	2	17T1T2	3
2017	T1	T	Thy-le-Château	3	17T1T3	3
2017	T1	T	Thy-le-Château	5	17T1T5	3
2017	T1	T	Thy-le-Château	6	17T1T6	3
2017	T1	T	Thy-le-Château	8	17T1T8	3
2017	T1	T	Thy-le-Château	9	17T1T9	3
2017	T1	T	Thy-le-Château	10	17T1T10	3
2017	T1	T	Thy-le-Château	12	17T1T12	3
2017	T1	T	Thy-le-Château	13	17T1T13	3
2017	T1	T	Thy-le-Château	14	17T1T14	3
2017	T1	T	Thy-le-Château	15	17T1T15	3
2017	T1	T	Thy-le-Château	16	17T1T16	3
2017	T1	T	Thy-le-Château	1	17T1T1	4
2017	T1	T	Thy-le-Château	2	17T1T2	4
2017	T1	T	Thy-le-Château	3	17T1T3	4
2017	T1	T	Thy-le-Château	4	17T1T4	4

2017	T1	T	Thy-le-Château	5	17T1T5	4
2017	T1	T	Thy-le-Château	6	17T1T6	4
2017	T1	T	Thy-le-Château	8	17T1T8	4
2017	T1	T	Thy-le-Château	9	17T1T9	4
2017	T1	T	Thy-le-Château	10	17T1T10	4
2017	T1	T	Thy-le-Château	11	17T1T11	4
2017	T1	T	Thy-le-Château	12	17T1T12	4
2017	T1	T	Thy-le-Château	14	17T1T14	4
2017	T1	T	Thy-le-Château	15	17T1T15	4
2017	T1	T	Thy-le-Château	16	17T1T16	4
2017	T2	T	Thy-le-Château	1	17T2T1	1
2017	T2	T	Thy-le-Château	2	17T2T2	1
2017	T2	T	Thy-le-Château	3	17T2T3	1
2017	T2	T	Thy-le-Château	4	17T2T4	1
2017	T2	T	Thy-le-Château	7	17T2T7	1
2017	T2	T	Thy-le-Château	8	17T2T8	1
2017	T2	T	Thy-le-Château	10	17T2T10	1
2017	T2	T	Thy-le-Château	2'	17T2T2'	1
2017	T2	T	Thy-le-Château	7'	17T2T7'	1
2017	T2	T	Thy-le-Château	1	17T2T1	2
2017	T2	T	Thy-le-Château	2	17T2T2	2
2017	T2	T	Thy-le-Château	3	17T2T3	2
2017	T2	T	Thy-le-Château	4	17T2T4	2
2017	T2	T	Thy-le-Château	5	17T2T5	2
2017	T2	T	Thy-le-Château	7	17T2T7	2
2017	T2	T	Thy-le-Château	9	17T2T9	2
2017	T2	T	Thy-le-Château	12	17T2T12	2
2017	T2	T	Thy-le-Château	13	17T2T13	2
2017	T2	T	Thy-le-Château	14	17T2T14	2
2017	T2	T	Thy-le-Château	1'	17T2T1'	2
2017	T2	T	Thy-le-Château	3'	17T2T3'	2
2017	T2	T	Thy-le-Château	1	17T2T1	3
2017	T2	T	Thy-le-Château	2	17T2T2	3
2017	T2	T	Thy-le-Château	3	17T2T3	3
2017	T2	T	Thy-le-Château	4	17T2T4	3
2017	T2	T	Thy-le-Château	5	17T2T5	3
2017	T2	T	Thy-le-Château	6	17T2T6	3
2017	T2	T	Thy-le-Château	8	17T2T8	3
2017	T2	T	Thy-le-Château	9	17T2T9	3
2017	T2	T	Thy-le-Château	10	17T2T10	3
2017	T2	T	Thy-le-Château	11	17T2T11	3
2017	T2	T	Thy-le-Château	4'	17T2T4'	3
2017	T2	T	Thy-le-Château	1	17T2T1	4
2017	T2	T	Thy-le-Château	2	17T2T2	4
2017	T2	T	Thy-le-Château	3	17T2T3	4
2017	T2	T	Thy-le-Château	4	17T2T4	4
2017	T2	T	Thy-le-Château	5	17T2T5	4
2017	T2	T	Thy-le-Château	6	17T2T6	4
2017	T2	T	Thy-le-Château	7	17T2T7	4
2017	T2	T	Thy-le-Château	8	17T2T8	4

2017	T2	T	Thy-le-Château	10	17T2T10	4
2017	T2	T	Thy-le-Château	11	17T2T11	4
2017	T2	T	Thy-le-Château	12	17T2T12	4
2017	T2	T	Thy-le-Château	13	17T2T13	4
2017	T3	T	Thy-le-Château	1	17T3T1	1
2017	T3	T	Thy-le-Château	2	17T3T2	1
2017	T3	T	Thy-le-Château	3	17T3T3	1
2017	T3	T	Thy-le-Château	4	17T3T4	1
2017	T3	T	Thy-le-Château	5	17T3T5	1
2017	T3	T	Thy-le-Château	6	17T3T6	1
2017	T3	T	Thy-le-Château	7	17T3T7	1
2017	T3	T	Thy-le-Château	8	17T3T8	1
2017	T3	T	Thy-le-Château	9	17T3T9	1
2017	T3	T	Thy-le-Château	10	17T3T10	1
2017	T3	T	Thy-le-Château	11	17T3T11	1
2017	T3	T	Thy-le-Château	11'	17T3T11'	1
2017	T3	T	Thy-le-Château	12	17T3T12	1
2017	T3	T	Thy-le-Château	1	17T3T1	2
2017	T3	T	Thy-le-Château	2	17T3T2	2
2017	T3	T	Thy-le-Château	4	17T3T4	2
2017	T3	T	Thy-le-Château	5	17T3T5	2
2017	T3	T	Thy-le-Château	7	17T3T7	2
2017	T3	T	Thy-le-Château	8	17T3T8	2
2017	T3	T	Thy-le-Château	9	17T3T9	2
2017	T3	T	Thy-le-Château	10	17T3T10	2
2017	T3	T	Thy-le-Château	11	17T3T11	2
2017	T3	T	Thy-le-Château	12	17T3T12	2
2017	T3	T	Thy-le-Château	13	17T3T13	2
2017	T3	T	Thy-le-Château	14	17T3T14	2
2017	T3	T	Thy-le-Château	1'	17T3T1'	2
2017	T3	T	Thy-le-Château	1	17T3T1	3
2017	T3	T	Thy-le-Château	2	17T3T2	3
2017	T3	T	Thy-le-Château	3	17T3T3	3
2017	T3	T	Thy-le-Château	4	17T3T4	3
2017	T3	T	Thy-le-Château	5	17T3T5	3
2017	T3	T	Thy-le-Château	6	17T3T6	3
2017	T3	T	Thy-le-Château	7	17T3T7	3
2017	T3	T	Thy-le-Château	8	17T3T8	3
2017	T3	T	Thy-le-Château	11	17T3T11	3
2017	T3	T	Thy-le-Château	12	17T3T12	3
2017	T3	T	Thy-le-Château	14	17T3T14	3
2017	T3	T	Thy-le-Château	15	17T3T15	3
2017	T3	T	Thy-le-Château	16	17T3T16	4
2017	T3	T	Thy-le-Château	1	17T3T1	4
2017	T3	T	Thy-le-Château	2	17T3T2	4
2017	T3	T	Thy-le-Château	3	17T3T3	4
2017	T3	T	Thy-le-Château	4	17T3T4	4
2017	T3	T	Thy-le-Château	5	17T3T5	4
2017	T3	T	Thy-le-Château	6	17T3T6	4
2017	T3	T	Thy-le-Château	7	17T3T7	4

2017	T3	T	Thy-le-Château	10	17T3T10	4
2017	T3	T	Thy-le-Château	11	17T3T11	4
2017	T3	T	Thy-le-Château	12	17T3T12	4
2017	T3	T	Thy-le-Château	14	17T3T14	4
2017	T3	T	Thy-le-Château	15	17T3T15	4

Traitement TE : Total de 53 souches

Traitement 1 : Total de 53 souches

Traitement 2 : Total de 44 souches

Traitement 3 : Total de 51 souches

➔ TOTAL DE 201 SOUCHES EN COLLECTION POUR 2017 – THY-LE-CHATEAU

Annexe 7 : Résumé des résultats des tests de la caractérisation in vitro de la sensibilité des souches de *Z. tritici* aux triazoles notamment au prothioconazole (prot) et au tébuconazole (tébu). Les données ont été obtenues sur des souches récoltées en 2008, 2009, 2016 et 2017 à partir de divers champs belges et sont décrites en fonction de divers facteurs

number	year	site	treatments	strain	fungicide	mean.EC50	mean.EC50.corrected	mean.EC50.corrected.2	log10.EC50.corrected.
1	2008	Sart Risbart	baseline	10//08	prot	0,081	0,119	0,119	-0,925
2	2008	Sart Risbart	baseline	11//08	prot	0,020	0,030	0,030	-1,530
3	2008	Sart Risbart	baseline	13//08	prot	0,041	0,061	0,061	-1,215
4	2008	Sart Risbart	baseline	14//08	prot	0,020	0,030	0,030	-1,519
5	2008	Sart Risbart	baseline	15//08	prot	0,029	0,043	0,043	-1,365
6	2008	Sart Risbart	baseline	3//08	prot	0,020	0,030	0,030	-1,530
7	2008	Sart Risbart	baseline	4//08	prot	0,020	0,030	0,030	-1,530
8	2008	Sart Risbart	baseline	5//08	prot	0,020	0,030	0,030	-1,530
9	2008	Sart Risbart	baseline	6//08	prot	0,020	0,029	0,029	-1,535
10	2008	Sart Risbart	baseline	7//08	prot	0,020	0,030	0,030	-1,530
11	2009	Niverlée	baseline	102//09	prot	0,020	0,030	0,030	-1,518
12	2009	Niverlée	baseline	103//09	prot	0,076	0,114	0,114	-0,945
13	2009	Niverlée	baseline	104//09	prot	0,076	0,116	0,116	-0,934
14	2009	Niverlée	baseline	107//09	prot	0,048	0,072	0,072	-1,140
15	2009	Niverlée	baseline	108//09	prot	0,020	0,022	0,022	-1,653
16	2009	Niverlée	baseline	110//09	prot	0,020	0,022	0,022	-1,662
17	2009	Perwez	baseline	112//09	prot	0,020	0,022	0,022	-1,662
18	2009	Perwez	baseline	118//09	prot	0,020	0,022	0,022	-1,662
19	2009	Perwez	baseline	121//09	prot	0,014	0,015	0,020	-1,699
20	2009	Les Isnes	baseline	124//09	prot	0,020	0,022	0,022	-1,662
21	2009	Les Isnes	baseline	125//09	prot	0,020	0,022	0,022	-1,662
22	2009	Les Isnes	baseline	126//09	prot	0,025	0,027	0,027	-1,562
23	2009	Les Isnes	baseline	130//09	prot	0,020	0,022	0,022	-1,662
24	2009	Les Isnes	baseline	132//09	prot	0,020	0,022	0,022	-1,662
25	2009	Graux	baseline	133//09	prot	0,020	0,044	0,044	-1,358
26	2009	Graux	baseline	134//09	prot	0,020	0,044	0,044	-1,358
27	2009	Graux	baseline	136//09	prot	0,020	0,044	0,044	-1,358
28	2009	Graux	baseline	145//09	prot	0,017	0,036	0,036	-1,446
29	2009	Graux	baseline	146//09	prot	0,046	0,101	0,101	-0,995
30	2009	Graux	baseline	147//09	prot	0,028	0,059	0,059	-1,227
31	2009	Thorembaix	baseline	155//09	prot	0,020	0,044	0,044	-1,358
32	2009	Thorembaix	baseline	156//09	prot	0,020	0,044	0,044	-1,358
33	2009	Thorembaix	baseline	157//09	prot	0,020	0,044	0,044	-1,358
34	2009	Thorembaix	baseline	158//09	prot	0,020	0,044	0,044	-1,358
35	2017	Ireland	C3test	C3	prot	0,051	0,123	0,123	-0,909
36	2017	Ireland	C3test	C3	prot	0,056	0,123	0,123	-0,909
37	2017	Ireland	C3test	C3	prot	0,050	0,123	0,123	-0,909
38	2017	Ireland	C3test	C3	prot	0,081	0,123	0,123	-0,909
39	2017	Ireland	C3test	C3	prot	0,097	0,123	0,123	-0,909

40	2017	Ireland	C3test	C3	prot	0,050	0,123	0,123	-0,909
41	2017	Ireland	C3test	C3	prot	0,060	0,123	0,123	-0,909
42	2017	Ireland	C3test	C3	prot	0,090	0,123	0,123	-0,909
43	2017	Ireland	C3test	C3	prot	0,061	0,123	0,123	-0,909
44	2017	Ireland	C3test	C3	prot	0,060	0,123	0,123	-0,909
45	2017	Ireland	C3test	C3	prot	0,063	0,123	0,123	-0,909
46	2017	Ireland	C3test	C3	prot	0,084	0,123	0,123	-0,909
47	2017	Ireland	C3test	C3	prot	0,153	0,123	0,123	-0,909
48	2017	Ireland	C3test	C3	prot	0,506	0,123	0,123	-0,909
49	2017	Ireland	C3test	C3	prot	0,050	0,123	0,123	-0,909
50	2017	Ireland	C3test	C3	prot	0,080	0,123	0,123	-0,909
51	2016	Ath	T1	16T1A1	prot	0,020	0,035	0,035	-1,450
52	2016	Ath	T1	16T1A10	prot	0,893	1,993	1,993	0,299
53	2016	Ath	T1	16T1A11	prot	0,020	0,046	0,046	-1,337
54	2016	Ath	T1	16T1A12	prot	0,032	0,074	0,074	-1,130
55	2016	Ath	T1	16T1A13	prot	0,116	0,268	0,268	-0,572
56	2016	Ath	T1	16T1A14	prot	0,697	1,606	1,606	0,206
57	2016	Ath	T1	16T1A15	prot	1,613	3,714	3,714	0,570
58	2016	Ath	T1	16T1A2	prot	0,281	0,485	0,485	-0,314
59	2016	Ath	T1	16T1A3	prot	0,115	0,187	0,187	-0,728
60	2016	Ath	T1	16T1A4	prot	0,108	0,149	0,149	-0,826
61	2016	Ath	T1	16T1A5	prot	0,048	0,088	0,088	-1,053
62	2016	Ath	T1	16T1A6	prot	1,429	3,271	3,271	0,515
63	2016	Ath	T1	16T1A7	prot	0,282	0,607	0,607	-0,216
64	2016	Ath	T1	16T1A8	prot	0,045	0,097	0,097	-1,011
65	2016	Ath	T1	16T1A9	prot	0,124	0,273	0,273	-0,564
66	2017	Ath	T1	17T1A1 rep1	prot	0,097	0,104	0,104	-0,982
67	2017	Ath	T1	17T1A1 rep3	prot	0,152	0,182	0,182	-0,740
68	2017	Ath	T1	17T1A10 rep4	prot	0,489	2,218	2,218	0,346
69	2017	Ath	T1	17T1A11 rep4	prot	0,294	1,305	1,305	0,116
70	2017	Ath	T1	17T1A12 rep1	prot	0,020	0,030	0,030	-1,518
71	2017	Ath	T1	17T1A13 rep2	prot	0,129	0,155	0,155	-0,809
72	2017	Ath	T1	17T1A14 rep1	prot	0,188	0,216	0,216	-0,667
73	2017	Ath	T1	17T1A16 rep4	prot	0,535	0,382	0,382	-0,418
74	2017	Ath	T1	17T1A3 rep3	prot	0,311	0,562	0,562	-0,250
75	2017	Ath	T1	17T1A4 rep2	prot	0,132	0,156	0,156	-0,806
76	2017	Ath	T1	17T1A5 rep3	prot	1,510	3,442	3,442	0,537
77	2017	Ath	T1	17T1A5 rep3	prot	0,723	0,185	0,185	-0,732
78	2017	Ath	T1	17T1A6 rep1	prot	0,215	0,242	0,242	-0,616
79	2017	Ath	T1	17T1A7 rep4	prot	0,347	0,126	0,126	-0,898
80	2017	Ath	T1	17T1A8 rep2	prot	0,140	0,195	0,195	-0,711
81	2017	Ath	T1	17T1A8 rep3	prot	0,048	0,086	0,086	-1,067
82	2016	Ath	T2	16T2A10	prot	0,126	0,272	0,272	-0,566
83	2016	Ath	T2	16T2A11	prot	0,136	0,301	0,301	-0,521
84	2016	Ath	T2	16T2A13	prot	0,262	0,665	0,665	-0,177

85	2016	Ath	T2	16T2A14	prot	0,020	0,053	0,053	-1,279
86	2016	Ath	T2	16T2A15	prot	0,253	0,638	0,638	-0,195
87	2016	Ath	T2	16T2A18	prot	0,190	0,475	0,475	-0,323
88	2016	Ath	T2	16T2A19	prot	0,235	0,583	0,583	-0,234
89	2016	Ath	T2	16T2A2	prot	0,056	0,142	0,142	-0,848
90	2016	Ath	T2	16T2A3	prot	0,020	0,051	0,051	-1,293
91	2016	Ath	T2	16T2A4	prot	0,189	0,493	0,493	-0,307
92	2016	Ath	T2	16T2A5	prot	0,046	0,116	0,116	-0,937
93	2016	Ath	T2	16T2A6	prot	0,210	0,441	0,441	-0,355
94	2016	Ath	T2	16T2A8	prot	0,298	0,614	0,614	-0,212
95	2016	Ath	T2	16T2A9	prot	0,263	0,512	0,512	-0,291
96	2017	Ath	T2	17T2A1 rep 1	prot	0,273	0,396	0,396	-0,402
97	2017	Ath	T2	17T2A1 rep3	prot	0,345	0,280	0,280	-0,553
98	2017	Ath	T2	17T2A11 rep2	prot	0,067	0,170	0,170	-0,769
99	2017	Ath	T2	17T2A15 rep4	prot	0,286	1,361	1,361	0,134
100	2017	Ath	T2	17T2A16 rep 2	prot	0,110	0,159	0,159	-0,798
101	2017	Ath	T2	17T2A17 rep4	prot	0,958	4,741	4,741	0,676
102	2017	Ath	T2	17T2A18 rep2	prot	0,206	0,298	0,298	-0,526
103	2017	Ath	T2	17T2A3 rep3	prot	0,385	1,913	1,913	0,282
104	2017	Ath	T2	17T2A3 rep4	prot	0,926	5,546	5,546	0,744
105	2017	Ath	T2	17T2A4 rep3	prot	0,809	0,654	0,654	-0,184
106	2017	Ath	T2	17T2A5 rep 2	prot	0,273	0,396	0,396	-0,402
107	2017	Ath	T2	17T2A6 rep 1	prot	0,228	0,333	0,333	-0,478
108	2017	Ath	T2	17T2A6 rep3	prot	0,479	0,352	0,352	-0,454
109	2017	Ath	T2	17T2A7 rep3	prot	0,020	0,015	0,020	-1,699
110	2017	Ath	T2	17T2A8 rep4	prot	0,418	0,319	0,319	-0,496
111	2017	Ath	T2	17T2A8 rep4 double	prot	0,523	0,401	0,401	-0,397
112	2016	Ath	T3	16T3A1	prot	0,122	0,198	0,198	-0,703
113	2016	Ath	T3	16T3A10	prot	1,316	3,104	3,104	0,492
114	2016	Ath	T3	16T3A11	prot	0,023	0,053	0,053	-1,279
115	2016	Ath	T3	16T3A12	prot	0,316	0,727	0,727	-0,138
116	2016	Ath	T3	16T3A13	prot	0,094	0,216	0,216	-0,665
117	2016	Ath	T3	16T3A16	prot	0,099	0,228	0,228	-0,642
118	2016	Ath	T3	16T3A2	prot	0,020	0,053	0,053	-1,275
119	2016	Ath	T3	16T3A23	prot	0,246	0,564	0,564	-0,249
120	2016	Ath	T3	16T3A3	prot	0,983	1,652	1,652	0,218
121	2016	Ath	T3	16T3A4	prot	0,158	0,254	0,254	-0,595
122	2016	Ath	T3	16T3A5	prot	0,156	0,242	0,242	-0,617
123	2016	Ath	T3	16T3A6	prot	0,148	0,316	0,316	-0,501
124	2016	Ath	T3	16T3A7	prot	1,359	2,910	2,910	0,464
125	2016	Ath	T3	16T3A8	prot	0,278	0,578	0,578	-0,238
126	2016	Ath	T3	16T3A9	prot	0,215	0,417	0,417	-0,379
127	2017	Ath	T3	17T3A10 rep2	prot	0,171	0,305	0,305	-0,516
128	2017	Ath	T3	17T3A10 rep3	prot	0,416	0,349	0,349	-0,457
129	2017	Ath	T3	17T3A12 rep2	prot	0,423	0,744	0,744	-0,128

130	2017	Ath	T3	17T3A2 rep2	prot	0,298	0,533	0,533	-0,273
131	2017	Ath	T3	17T3A2 rep3	prot	0,238	1,243	1,243	0,094
132	2017	Ath	T3	17T3A3 rep3	prot	0,878	4,361	4,361	0,640
133	2017	Ath	T3	17T3A4 rep2	prot	1,378	2,460	2,460	0,391
134	2017	Ath	T3	17T3A4 rep3	prot	0,423	1,997	1,997	0,300
135	2017	Ath	T3	17T3A4 rep4	prot	0,171	0,383	0,383	-0,417
136	2017	Ath	T3	17T3A5 rep2	prot	0,228	0,419	0,419	-0,378
137	2017	Ath	T3	17T3A5 rep3	prot	0,269	1,247	1,247	0,096
138	2017	Ath	T3	17T3A6 rep 2	prot	0,051	0,091	0,091	-1,039
139	2017	Ath	T3	17T3A6 rep3	prot	2,073	1,769	1,769	0,248
140	2017	Ath	T3	17T3A7 rep2	prot	0,140	0,251	0,251	-0,600
141	2016	Ath	untreated	16TEA21	prot	0,177	0,442	0,442	-0,355
142	2016	Ath	untreated	16TEA1	prot	0,463	1,174	1,174	0,070
143	2016	Ath	untreated	16TEA12	prot	0,020	0,053	0,053	-1,280
144	2016	Ath	untreated	16TEA16	prot	0,178	0,397	0,397	-0,401
145	2016	Ath	untreated	16TEA17	prot	0,195	0,428	0,428	-0,369
146	2016	Ath	untreated	16TEA18	prot	0,128	0,276	0,276	-0,559
147	2016	Ath	untreated	16TEA19	prot	4,113	10,012	10,012	1,001
148	2016	Ath	untreated	16TEA2	prot	0,051	0,131	0,131	-0,884
149	2016	Ath	untreated	16TEA22	prot	0,115	0,287	0,287	-0,542
150	2016	Ath	untreated	16TEA23	prot	0,020	0,050	0,050	-1,302
151	2016	Ath	untreated	16TEA24	prot	0,022	0,055	0,055	-1,260
152	2016	Ath	untreated	16TEA4	prot	0,048	0,122	0,122	-0,913
153	2016	Ath	untreated	16TEA5	prot	0,341	0,871	0,871	-0,060
154	2016	Ath	untreated	16TEA7	prot	0,051	0,133	0,133	-0,875
155	2017	Ath	untreated	17TEA11 rep1	prot	0,883	1,402	1,402	0,147
156	2017	Ath	untreated	17TEA11 rep1	prot	0,826	1,232	1,232	0,091
157	2017	Ath	untreated	17TEA12 rep1	prot	0,186	0,282	0,282	-0,549
158	2017	Ath	untreated	17TEA13 rep1	prot	1,344	2,367	2,367	0,374
159	2017	Ath	untreated	17TEA14 rep 1	prot	0,176	0,256	0,256	-0,592
160	2017	Ath	untreated	17TEA14 rep2	prot	0,151	0,275	0,275	-0,560
161	2017	Ath	untreated	17TEA14 rep2 bis	prot	0,159	0,288	0,288	-0,541
162	2017	Ath	untreated	17TEA15 rep1	prot	0,078	0,115	0,115	-0,939
163	2017	Ath	untreated	17TEA2 rep 1	prot	1,049	1,520	1,520	0,182
164	2017	Ath	untreated	17TEA3 rep 1	prot	0,543	0,790	0,790	-0,102
165	2017	Ath	untreated	17TEA3 rep3	prot	0,120	0,216	0,216	-0,665
166	2017	Ath	untreated	17TEA3 rep4	prot	1,614	2,457	2,457	0,390
167	2017	Ath	untreated	17TEA4 rep3	prot	3,326	5,051	5,051	0,703
168	2017	Ath	untreated	17TEA6 rep1	prot	0,109	0,158	0,158	-0,800
169	2017	Ath	untreated	17TEA7 rep2	prot	0,151	0,276	0,276	-0,559
170	2017	Ath	untreated	17TEA8 rep1	prot	0,242	0,436	0,436	-0,360
171	2008	Sart Risbart	baseline	10//08	tebu	0,272	0,348	0,348	-0,458
172	2008	Sart Risbart	baseline	11//08	tebu	1,783	2,191	2,191	0,341
173	2008	Sart Risbart	baseline	13//08	tebu	1,799	2,320	2,320	0,366
174	2008	Sart Risbart	baseline	14//08	tebu	5,280	6,566	6,566	0,817

175	2008	Sart Risbart	baseline	15//08	tebu	5,579	6,773	6,773	0,831
176	2008	Sart Risbart	baseline	3//08	tebu	3,457	4,295	4,295	0,633
177	2008	Sart Risbart	baseline	4//08	tebu	1,723	2,043	2,043	0,310
178	2008	Sart Risbart	baseline	5//08	tebu	1,806	2,363	2,363	0,374
179	2008	Sart Risbart	baseline	6//08	tebu	3,396	4,085	4,085	0,611
180	2008	Sart Risbart	baseline	7//08	tebu	0,112	0,160	0,160	-0,797
181	2009	Niverlée	baseline	102//09	tebu	0,051	0,084	0,084	-1,076
182	2009	Niverlée	baseline	103//09	tebu	4,535	7,461	7,461	0,873
183	2009	Niverlée	baseline	104//09	tebu	5,324	8,757	8,757	0,942
184	2009	Niverlée	baseline	107//09	tebu	2,849	4,683	4,683	0,671
185	2009	Niverlée	baseline	108//09	tebu	1,841	2,071	2,071	0,316
186	2009	Niverlée	baseline	110//09	tebu	2,653	3,001	3,001	0,477
187	2009	Perwez	baseline	112//09	tebu	2,181	2,451	2,451	0,389
188	2009	Perwez	baseline	118//09	tebu	1,023	1,182	1,182	0,072
189	2009	Perwez	baseline	121//09	tebu	1,257	1,423	1,423	0,153
190	2009	Les Isnes	baseline	124//09	tebu	2,230	2,520	2,520	0,401
191	2009	Les Isnes	baseline	125//09	tebu	1,330	1,496	1,496	0,175
192	2009	Les Isnes	baseline	126//09	tebu	2,822	3,141	3,141	0,497
193	2009	Les Isnes	baseline	130//09	tebu	0,794	0,913	0,913	-0,039
194	2009	Les Isnes	baseline	132//09	tebu	3,799	4,290	4,290	0,632
195	2009	Graux	baseline	133//09	tebu	0,877	1,501	1,501	0,176
196	2009	Graux	baseline	134//09	tebu	0,530	0,903	0,903	-0,044
197	2009	Graux	baseline	136//09	tebu	4,075	7,098	7,098	0,851
198	2009	Graux	baseline	145//09	tebu	1,641	2,835	2,835	0,453
199	2009	Graux	baseline	146//09	tebu	9,848	16,804	16,804	1,225
200	2009	Graux	baseline	147//09	tebu	1,847	3,219	3,219	0,508
201	2009	Thorembaix	baseline	155//09	tebu	0,451	0,770	0,770	-0,114
202	2009	Thorembaix	baseline	156//09	tebu	3,432	5,928	5,928	0,773
203	2009	Thorembaix	baseline	157//09	tebu	2,060	3,564	3,564	0,552
204	2009	Thorembaix	baseline	158//09	tebu	0,443	0,758	0,758	-0,120
205	2017	Ireland	C3test	C3	tebu	4,714	8,204	8,204	0,914
206	2017	Ireland	C3test	C3	tebu	8,102	8,204	8,204	0,914
207	2017	Ireland	C3test	C3	tebu	7,899	8,204	8,204	0,914
208	2017	Ireland	C3test	C3	tebu	5,380	8,204	8,204	0,914
209	2017	Ireland	C3test	C3	tebu	10,071	8,204	8,204	0,914
210	2017	Ireland	C3test	C3	tebu	7,938	8,204	8,204	0,914
211	2017	Ireland	C3test	C3	tebu	6,231	8,204	8,204	0,914
212	2017	Ireland	C3test	C3	tebu	6,070	8,204	8,204	0,914
213	2017	Ireland	C3test	C3	tebu	19,692	8,204	8,204	0,914
214	2017	Ireland	C3test	C3	tebu	7,530	8,204	8,204	0,914
215	2017	Ireland	C3test	C3	tebu	6,151	8,204	8,204	0,914
216	2017	Ireland	C3test	C3	tebu	6,348	8,204	8,204	0,914
217	2017	Ireland	C3test	C3	tebu	4,411	8,204	8,204	0,914
218	2017	Ireland	C3test	C3	tebu	9,235	8,204	8,204	0,914
219	2017	Ireland	C3test	C3	tebu	6,218	8,204	8,204	0,914

220	2017	Ireland	C3test	C3	tebu	5,765	8,204	8,204	0,914
221	2016	Ath	T1	16T1A1	tebu	2,597	2,557	2,557	0,408
222	2016	Ath	T1	16T1A10	tebu	3,951	5,246	5,246	0,720
223	2016	Ath	T1	16T1A11	tebu	0,517	0,727	0,727	-0,138
224	2016	Ath	T1	16T1A12	tebu	3,351	4,658	4,658	0,668
225	2016	Ath	T1	16T1A13	tebu	0,297	0,411	0,411	-0,386
226	2016	Ath	T1	16T1A14	tebu	1,147	1,593	1,593	0,202
227	2016	Ath	T1	16T1A15	tebu	3,607	4,993	4,993	0,698
228	2016	Ath	T1	16T1A2	tebu	2,522	2,580	2,580	0,412
229	2016	Ath	T1	16T1A3	tebu	13,663	13,623	13,623	1,134
230	2016	Ath	T1	16T1A4	tebu	28,121	27,920	27,920	1,446
231	2016	Ath	T1	16T1A5	tebu	0,170	0,167	0,167	-0,777
232	2016	Ath	T1	16T1A6	tebu	5,373	7,156	7,156	0,855
233	2016	Ath	T1	16T1A7	tebu	0,244	0,344	0,344	-0,464
234	2016	Ath	T1	16T1A8	tebu	7,479	9,903	9,903	0,996
235	2016	Ath	T1	16T1A9	tebu	0,257	0,351	0,351	-0,454
236	2017	Ath	T1	17T1A1 rep1	tebu	10,110	9,659	9,659	0,985
237	2017	Ath	T1	17T1A1 rep3	tebu	0,857	0,818	0,818	-0,087
238	2017	Ath	T1	17T1A10 rep4	tebu	2,174	1,748	1,748	0,242
239	2017	Ath	T1	17T1A11 rep4	tebu	0,578	0,486	0,486	-0,314
240	2017	Ath	T1	17T1A12 rep1	tebu	1,604	2,637	2,637	0,421
241	2017	Ath	T1	17T1A13 rep2	tebu	0,362	0,346	0,346	-0,461
242	2017	Ath	T1	17T1A14 rep1	tebu	0,547	0,522	0,522	-0,282
243	2017	Ath	T1	17T1A16 rep4	tebu	28,720	52,140	30,000	1,477
244	2017	Ath	T1	17T1A3 rep3	tebu	2,823	2,769	2,769	0,442
245	2017	Ath	T1	17T1A4 rep2	tebu	0,359	0,343	0,343	-0,465
246	2017	Ath	T1	17T1A5 rep3	tebu	1,476	1,405	1,405	0,148
247	2017	Ath	T1	17T1A6 rep1	tebu	12,338	20,318	20,318	1,308
248	2017	Ath	T1	17T1A7 rep4	tebu	0,968	1,978	1,978	0,296
249	2017	Ath	T1	17T1A8 rep1	tebu	0,402	0,382	0,382	-0,418
250	2017	Ath	T1	17T1A8 rep2	tebu	0,291	0,280	0,280	-0,552
251	2017	Ath	T1	17T1A8 rep3	tebu	0,738	0,892	0,892	-0,049
252	2016	Ath	T2	16T2A10	tebu	0,289	0,392	0,392	-0,407
253	2016	Ath	T2	16T2A11	tebu	0,190	0,253	0,253	-0,596
254	2016	Ath	T2	16T2A13	tebu	3,792	6,142	6,142	0,788
255	2016	Ath	T2	16T2A14	tebu	1,346	2,297	2,297	0,361
256	2016	Ath	T2	16T2A15	tebu	0,512	0,880	0,880	-0,055
257	2016	Ath	T2	16T2A18	tebu	0,397	0,684	0,684	-0,165
258	2016	Ath	T2	16T2A19	tebu	2,993	5,219	5,219	0,718
259	2016	Ath	T2	16T2A2	tebu	30,000	34,821	30,000	1,477
260	2016	Ath	T2	16T2A3	tebu	8,270	9,711	9,711	0,987
261	2016	Ath	T2	16T2A4	tebu	0,225	0,264	0,264	-0,579
262	2016	Ath	T2	16T2A5	tebu	4,521	5,261	5,261	0,721
263	2016	Ath	T2	16T2A6	tebu	0,386	0,523	0,523	-0,282
264	2016	Ath	T2	16T2A8	tebu	2,976	4,067	4,067	0,609

265	2016	Ath	T2	16T2A9	tebu	1,523	2,067	2,067	0,315
266	2017	Ath	T2	17T2A1 rep 1	tebu	0,885	0,946	0,946	-0,024
267	2017	Ath	T2	17T2A1 rep3	tebu	0,549	0,921	0,921	-0,036
268	2017	Ath	T2	17T2A11 rep2	tebu	5,438	6,414	6,414	0,807
269	2017	Ath	T2	17T2A15 rep4	tebu	0,891	0,976	0,976	-0,010
270	2017	Ath	T2	17T2A16 rep 2	tebu	0,307	0,329	0,329	-0,483
271	2017	Ath	T2	17T2A17 rep4	tebu	8,793	9,121	9,121	0,960
272	2017	Ath	T2	17T2A18 rep2	tebu	0,438	0,466	0,466	-0,332
273	2017	Ath	T2	17T2A3 rep3	tebu	0,879	0,885	0,885	-0,053
274	2017	Ath	T2	17T2A3 rep4	tebu	0,655	0,633	0,633	-0,198
275	2017	Ath	T2	17T2A4 rep3	tebu	9,657	16,890	16,890	1,228
276	2017	Ath	T2	17T2A5 rep 2	tebu	3,669	3,895	3,895	0,591
277	2017	Ath	T2	17T2A6 rep 1	tebu	3,715	3,902	3,902	0,591
278	2017	Ath	T2	17T2A6 rep3	tebu	4,092	7,340	7,340	0,866
279	2017	Ath	T2	17T2A7 rep3	tebu	1,175	2,335	2,335	0,368
280	2017	Ath	T2	17T2A8 rep4	tebu	1,355	2,502	2,502	0,398
281	2017	Ath	T2	17T2A8 rep4 double	tebu	1,034	1,091	1,091	0,038
282	2016	Ath	T3	16T3A1	tebu	0,416	0,410	0,410	-0,387
283	2016	Ath	T3	16T3A10	tebu	0,612	0,713	0,713	-0,147
284	2016	Ath	T3	16T3A11	tebu	3,302	4,575	4,575	0,660
285	2016	Ath	T3	16T3A12	tebu	0,317	0,439	0,439	-0,358
286	2016	Ath	T3	16T3A13	tebu	0,233	0,324	0,324	-0,490
287	2016	Ath	T3	16T3A16	tebu	0,141	0,193	0,193	-0,715
288	2016	Ath	T3	16T3A2	tebu	2,571	2,492	2,492	0,397
289	2016	Ath	T3	16T3A23	tebu	3,464	4,811	4,811	0,682
290	2016	Ath	T3	16T3A3	tebu	0,863	0,838	0,838	-0,077
291	2016	Ath	T3	16T3A4	tebu	0,373	0,372	0,372	-0,430
292	2016	Ath	T3	16T3A5	tebu	0,560	0,555	0,555	-0,256
293	2016	Ath	T3	16T3A6	tebu	0,386	0,456	0,456	-0,341
294	2016	Ath	T3	16T3A7	tebu	1,086	1,301	1,301	0,114
295	2016	Ath	T3	16T3A8	tebu	2,700	3,227	3,227	0,509
296	2016	Ath	T3	16T3A9	tebu	0,073	0,093	0,093	-1,030
297	2017	Ath	T3	17T3A10 rep2	tebu	0,343	0,411	0,411	-0,386
298	2017	Ath	T3	17T3A10 rep3	tebu	0,826	1,403	1,403	0,147
299	2017	Ath	T3	17T3A12 rep2	tebu	0,374	0,442	0,442	-0,355
300	2017	Ath	T3	17T3A2 rep2	tebu	19,826	23,697	23,697	1,375
301	2017	Ath	T3	17T3A2 rep3	tebu	1,338	1,309	1,309	0,117
302	2017	Ath	T3	17T3A3 rep3	tebu	1,101	1,149	1,149	0,060
303	2017	Ath	T3	17T3A4 rep2	tebu	1,684	2,041	2,041	0,310
304	2017	Ath	T3	17T3A4 rep3	tebu	0,827	0,991	0,991	-0,004
305	2017	Ath	T3	17T3A4 rep4	tebu	0,233	0,275	0,275	-0,561
306	2017	Ath	T3	17T3A5 rep2	tebu	0,575	0,701	0,701	-0,154
307	2017	Ath	T3	17T3A5 rep3	tebu	1,013	0,999	0,999	-0,001
308	2017	Ath	T3	17T3A6 rep 2	tebu	4,064	4,924	4,924	0,692
309	2017	Ath	T3	17T3A6 rep3	tebu	2,670	5,253	5,253	0,720

310	2017	Ath	T3	17T3A7 rep2	tebu	10,245	12,553	12,553	1,099
311	2016	Ath	untreated	16TEA21	tebu	0,522	0,904	0,904	-0,044
312	2016	Ath	untreated	16TEA1	tebu	27,369	31,872	30,000	1,477
313	2016	Ath	untreated	16TEA12	tebu	0,056	0,067	0,067	-1,172
314	2016	Ath	untreated	16TEA16	tebu	17,420	20,731	20,731	1,317
315	2016	Ath	untreated	16TEA17	tebu	0,384	0,455	0,455	-0,342
316	2016	Ath	untreated	16TEA18	tebu	0,226	0,271	0,271	-0,567
317	2016	Ath	untreated	16TEA19	tebu	5,477	9,443	9,443	0,975
318	2016	Ath	untreated	16TEA2	tebu	0,174	0,204	0,204	-0,690
319	2016	Ath	untreated	16TEA22	tebu	0,331	0,573	0,573	-0,242
320	2016	Ath	untreated	16TEA23	tebu	3,307	5,688	5,688	0,755
321	2016	Ath	untreated	16TEA24	tebu	6,324	10,884	10,884	1,037
322	2016	Ath	untreated	16TEA4	tebu	0,152	0,175	0,175	-0,757
323	2016	Ath	untreated	16TEA5	tebu	21,975	25,625	25,625	1,409
324	2016	Ath	untreated	16TEA7	tebu	4,460	5,196	5,196	0,716
325	2017	Ath	untreated	17TEA11 rep1	tebu	0,910	1,389	1,389	0,143
326	2017	Ath	untreated	17TEA11 rep1	tebu	1,031	1,647	1,647	0,217
327	2017	Ath	untreated	17TEA12 rep1	tebu	0,514	0,846	0,846	-0,073
328	2017	Ath	untreated	17TEA13 rep1	tebu	3,049	3,129	3,129	0,495
329	2017	Ath	untreated	17TEA14 rep 1	tebu	15,635	16,501	16,501	1,217
330	2017	Ath	untreated	17TEA14 rep2	tebu	0,426	0,416	0,416	-0,381
331	2017	Ath	untreated	17TEA14 rep2 double	tebu	0,449	0,439	0,439	-0,357
332	2017	Ath	untreated	17TEA15 rep1	tebu	7,759	8,349	8,349	0,922
333	2017	Ath	untreated	17TEA2 rep 1	tebu	1,176	1,235	1,235	0,092
334	2017	Ath	untreated	17TEA3 rep 1	tebu	15055,063	17111,563	30,000	1,477
335	2017	Ath	untreated	17TEA3 rep3	tebu	0,195	0,190	0,190	-0,722
336	2017	Ath	untreated	17TEA3 rep4	tebu	1,149	1,889	1,889	0,276
337	2017	Ath	untreated	17TEA4 rep3	tebu	3,265	5,370	5,370	0,730
338	2017	Ath	untreated	17TEA6 rep1	tebu	3,785	4,091	4,091	0,612
339	2017	Ath	untreated	17TEA7 rep2	tebu	0,354	0,347	0,347	-0,460
340	2017	Ath	untreated	17TEA8 rep1	tebu	0,463	0,452	0,452	-0,344
341	2008	Sart Risbart	baseline	16//08	prot	0,020	0,029	0,029	-1,538
342	2008	Sart Risbart	baseline	17//08	prot	0,020	0,026	0,026	-1,586
343	2008	Sart Risbart	baseline	18//08	prot	0,647	1,030	1,030	0,013
344	2008	Sart Risbart	baseline	20//08	prot	0,043	0,062	0,062	-1,206
345	2008	Sart Risbart	baseline	26//08	prot	0,020	0,026	0,026	-1,586
346	2008	Sart Risbart	baseline	27//08	prot	0,020	0,028	0,028	-1,548
347	2008	Sart Risbart	baseline	28//08	prot	0,020	0,026	0,026	-1,586
348	2008	Sart Risbart	baseline	29//08	prot	0,020	0,026	0,026	-1,586
349	2008	Sart Risbart	baseline	30//08	prot	0,020	0,026	0,026	-1,586
350	2008	Sart Risbart	baseline	34//08	prot	0,020	0,029	0,029	-1,538
351	2008	Sart Risbart	baseline	35//08	prot	0,020	0,023	0,023	-1,637
352	2008	Sart Risbart	baseline	36//08	prot	0,020	0,023	0,023	-1,637
353	2008	Corroy-le-Grand	baseline	38//08	prot	0,020	0,023	0,023	-1,637

354	2008	Corroy-le-Grand	baseline	39//08	prot	0,031	0,021	0,021	-1,676
355	2008	Corroy-le-Grand	baseline	40//08	prot	0,035	0,023	0,023	-1,643
356	2008	Corroy-le-Grand	baseline	41//08	prot	0,020	0,016	0,020	-1,699
357	2008	Corroy-le-Grand	baseline	42//08	prot	0,020	0,023	0,023	-1,637
358	2008	Corroy-le-Grand	baseline	43//08	prot	0,020	0,023	0,023	-1,637
359	2008	Corroy-le-Grand	baseline	45//08	prot	0,020	0,023	0,023	-1,637
360	2008	Corroy-le-Grand	baseline	47//08	prot	0,020	0,019	0,020	-1,699
361	2008	Corroy-le-Grand	baseline	48//08	prot	0,020	0,019	0,020	-1,699
362	2008	Corroy-le-Grand	baseline	517//08	prot	0,020	0,019	0,020	-1,699
363	2008	Corroy-le-Grand	baseline	52//08	prot	0,020	0,019	0,020	-1,699
364	2008	Corroy-le-Grand	baseline	54//08	prot	0,020	0,019	0,020	-1,699
365	2008	Corroy-le-Grand	baseline	55//08	prot	0,020	0,019	0,020	-1,699
366	2008	Corroy-le-Grand	baseline	56//08	prot	0,020	0,019	0,020	-1,699
367	2008	Corroy-le-Grand	baseline	57//08	prot	0,218	0,232	0,232	-0,635
368	2008	Graux	baseline	58//08	prot	0,020	0,019	0,020	-1,699
369	2008	Graux	baseline	623//08	prot	0,020	0,014	0,020	-1,699
370	2017	Ireland	C3test	C3	prot	0,129	0,123	0,123	-0,909
371	2017	Ireland	C3test	C3	prot	0,136	0,123	0,123	-0,909
372	2017	Ireland	C3test	C3	prot	0,136	0,123	0,123	-0,909
373	2017	Ireland	C3test	C3	prot	0,113	0,123	0,123	-0,909
374	2017	Ireland	C3test	C3	prot	0,149	0,123	0,123	-0,909
375	2017	Ireland	C3test	C3	prot	0,143	0,123	0,123	-0,909
376	2017	Ireland	C3test	C3	prot	0,144	0,123	0,123	-0,909
377	2017	Ireland	C3test	C3	prot	0,096	0,123	0,123	-0,909
378	2017	Ireland	C3test	C3	prot	0,145	0,123	0,123	-0,909
379	2017	Ireland	C3test	C3	prot	0,146	0,123	0,123	-0,909
380	2017	Ireland	C3test	C3	prot	0,122	0,123	0,123	-0,909
381	2017	Ireland	C3test	C3	prot	0,160	0,123	0,123	-0,909
382	2017	Ireland	C3test	C3	prot	0,142	0,123	0,123	-0,909
383	2017	Ireland	C3test	C3	prot	0,194	0,123	0,123	-0,909
384	2017	Ireland	C3test	C3	prot	0,241	0,123	0,123	-0,909
385	2017	Ireland	C3test	C3	prot	0,161	0,123	0,123	-0,909
386	2016	Ath	T1	16T1A16	prot	0,079	0,123	0,056	-1,253
387	2016	Ath	T1	16T1A22	prot	0,158	0,123	0,131	-0,883
388	2016	Ath	T1	16T1A23	prot	0,091	0,123	0,074	-1,132
389	2016	Thylechateau	T1	16T1T1	prot	0,114	0,123	0,086	-1,063
390	2016	Thylechateau	T1	16T1T12	prot	0,014	0,010	0,020	-1,699
391	2016	Thylechateau	T1	16T1T14	prot	0,216	0,123	0,202	-0,694
392	2016	Thylechateau	T1	16T1T15	prot	0,093	0,123	0,087	-1,063
393	2016	Thylechateau	T1	16T1T16	prot	0,197	0,123	0,184	-0,735
394	2016	Thylechateau	T1	16T1T18	prot	0,147	0,123	0,137	-0,863
395	2016	Thylechateau	T1	16T1T19	prot	0,417	0,123	0,390	-0,409
396	2016	Thylechateau	T1	16T1T2	prot	0,119	0,123	0,091	-1,041

397	2016	Thylechateau	T1	16T1T20	prot	0,246	0,123	0,194	-0,712
398	2016	Thylechateau	T1	16T1T7	prot	0,121	0,123	0,094	-1,026
399	2016	Thylechateau	T1	16T1T8	prot	0,132	0,123	0,095	-1,021
400	2016	Thylechateau	T1	16T1T9	prot	0,060	0,123	0,046	-1,339
401	2017	Thylechateau	T1	17T1T1 rep1	prot	0,142	0,123	0,123	-0,909
402	2017	Thylechateau	T1	17T1T1 rep2	prot	0,722	0,759	0,759	-0,120
403	2017	Thylechateau	T1	17T1T2 rep1	prot	0,020	0,018	0,020	-1,699
404	2017	Thylechateau	T1	17T1T2 rep3	prot	0,020	0,018	0,020	-1,699
405	2017	Thylechateau	T1	17T1T3 rep1	prot	0,185	0,168	0,168	-0,776
406	2017	Thylechateau	T1	17T1T3 rep2	prot	0,176	0,185	0,185	-0,733
407	2017	Thylechateau	T1	17T1T3 rep3	prot	0,020	0,018	0,020	-1,699
408	2017	Thylechateau	T1	17T1T3 rep4	prot	0,088	0,062	0,062	-1,206
409	2017	Thylechateau	T1	17T1T4 rep2	prot	0,132	0,139	0,139	-0,856
410	2017	Thylechateau	T1	17T1T5 rep2	prot	0,294	0,309	0,309	-0,510
411	2017	Thylechateau	T1	17T1T6 rep1	prot	1,153	1,040	1,040	0,017
412	2017	Thylechateau	T1	17T1T6 rep2	prot	0,105	0,111	0,111	-0,956
413	2017	Thylechateau	T1	17T1T6 rep3	prot	0,020	0,018	0,020	-1,699
414	2017	Thylechateau	T1	17T1T8 rep3	prot	0,116	0,103	0,103	-0,986
415	2017	Thylechateau	T1	17T1T9 rep3	prot	0,463	0,415	0,415	-0,382
416	2016	Ath	T2	16T2A23	prot	0,093	0,066	0,066	-1,180
417	2016	Thylechateau	T2	16T2T1	prot	0,020	0,014	0,020	-1,699
418	2016	Thylechateau	T2	16T2T12	prot	0,369	0,291	0,291	-0,535
419	2016	Thylechateau	T2	16T2T15	prot	0,174	0,134	0,134	-0,873
420	2016	Thylechateau	T2	16T2T16	prot	0,100	0,072	0,072	-1,140
421	2016	Thylechateau	T2	16T2T17	prot	0,156	0,117	0,117	-0,933
422	2016	Thylechateau	T2	16T2T24	prot	0,496	0,449	0,449	-0,347
423	2016	Thylechateau	T2	16T2T3	prot	0,571	0,413	0,413	-0,384
424	2016	Thylechateau	T2	16T2T4	prot	0,201	0,145	0,145	-0,838
425	2016	Thylechateau	T2	16T2T6	prot	0,208	0,150	0,150	-0,823
426	2016	Thylechateau	T2	16T2T9	prot	0,743	0,569	0,569	-0,245
427	2017	Thylechateau	T2	17T2T1 rep1	prot	0,408	0,321	0,321	-0,493
428	2017	Thylechateau	T2	17T2T1 rep2	prot	0,119	0,112	0,112	-0,952
429	2017	Thylechateau	T2	17T2T1 rep3	prot	0,051	0,043	0,043	-1,362
430	2017	Thylechateau	T2	17T2T1 rep4	prot	0,302	0,241	0,241	-0,618
431	2017	Thylechateau	T2	17T2T2 rep1	prot	0,218	0,172	0,172	-0,764
432	2017	Thylechateau	T2	17T2T2 rep2	prot	0,355	0,334	0,334	-0,476
433	2017	Thylechateau	T2	17T2T2 rep4	prot	1,346	0,947	0,947	-0,023
434	2017	Thylechateau	T2	17T2T3 rep1	prot	0,402	0,317	0,317	-0,499
435	2017	Thylechateau	T2	17T2T3 rep2	prot	0,497	0,467	0,467	-0,331
436	2017	Thylechateau	T2	17T2T3 rep3	prot	0,507	0,430	0,430	-0,366
437	2017	Thylechateau	T2	17T2T4 rep1	prot	0,234	0,184	0,184	-0,735
438	2017	Thylechateau	T2	17T2T4 rep2	prot	0,155	0,146	0,146	-0,837
439	2017	Thylechateau	T2	17T2T4 rep3	prot	1,817	1,524	1,524	0,183
440	2017	Thylechateau	T2	17T2T4 rep4	prot	0,358	0,252	0,252	-0,599
441	2017	Thylechateau	T2	17T2T5 rep2	prot	0,411	0,387	0,387	-0,412

442	2017	Thylechateau	T2	17T2T5 rep3	prot	0,213	0,181	0,181	-0,743
443	2017	Thylechateau	T2	17T2T6 rep3	prot	2,198	1,854	1,854	0,268
444	2017	Thylechateau	T2	17T2T7 rep1	prot	0,181	0,142	0,142	-0,848
445	2016	Ath	T3	16T3A21rf	prot	3,708	2,216	2,216	0,346
446	2016	Thylechateau	T3	16T3T13	prot	0,137	0,107	0,107	-0,972
447	2016	Thylechateau	T3	16T3T14	prot	0,180	0,143	0,143	-0,844
448	2016	Thylechateau	T3	16T3T19a	prot	0,449	0,277	0,277	-0,558
449	2016	Thylechateau	T3	16T3T19b	prot	0,151	0,115	0,115	-0,939
450	2016	Thylechateau	T3	16T3T2	prot	0,020	0,014	0,020	-1,699
451	2016	Thylechateau	T3	16T3T20	prot	8,505	5,080	5,080	0,706
452	2016	Thylechateau	T3	16T3T4	prot	0,184	0,133	0,133	-0,877
453	2016	Thylechateau	T3	16T3T5	prot	0,257	0,185	0,185	-0,733
454	2016	Thylechateau	T3	16T3T6	prot	0,034	0,025	0,025	-1,603
455	2016	Thylechateau	T3	16T3T7	prot	0,033	0,024	0,024	-1,623
456	2016	Thylechateau	T3	16T3T8	prot	0,220	0,216	0,216	-0,666
457	2016	Thylechateau	T3	16T3T8	prot	0,278	0,162	0,162	-0,791
458	2016	Thylechateau	T3	16T3T9	prot	0,099	0,077	0,077	-1,115
459	2017	Thylechateau	T3	17T3T1 rep1	prot	0,168	0,133	0,133	-0,875
460	2017	Thylechateau	T3	17T3T1 rep2	prot	0,454	0,427	0,427	-0,370
461	2017	Thylechateau	T3	17T3T1 rep3	prot	0,332	0,282	0,282	-0,550
462	2017	Thylechateau	T3	17T3T2 rep1	prot	0,645	0,503	0,503	-0,298
463	2017	Thylechateau	T3	17T3T2 rep2	prot	0,178	0,167	0,167	-0,777
464	2017	Thylechateau	T3	17T3T2 rep3	prot	0,270	0,228	0,228	-0,643
465	2017	Thylechateau	T3	17T3T2 rep4	prot	0,215	0,151	0,151	-0,820
466	2017	Thylechateau	T3	17T3T3 rep1	prot	0,355	0,278	0,278	-0,556
467	2017	Thylechateau	T3	17T3T3 rep3	prot	0,122	0,106	0,106	-0,973
468	2017	Thylechateau	T3	17T3T3 rep4	prot	0,279	0,282	0,282	-0,550
469	2017	Thylechateau	T3	17T3T4 rep1	prot	0,278	0,220	0,220	-0,658
470	2017	Thylechateau	T3	17T3T4 rep2	prot	0,131	0,124	0,124	-0,908
471	2017	Thylechateau	T3	17T3T4 rep3	prot	0,535	0,453	0,453	-0,344
472	2017	Thylechateau	T3	17T3T4 rep4	prot	0,286	0,201	0,201	-0,697
473	2017	Thylechateau	T3	17T3T5 rep1	prot	0,123	0,099	0,099	-1,005
474	2017	Thylechateau	T3	17T3T5 rep2	prot	0,131	0,123	0,123	-0,910
475	2017	Thylechateau	T3	17T3T5 rep3	prot	0,727	0,617	0,617	-0,210
476	2017	Thylechateau	T3	17T3T6 rep1	prot	0,249	0,219	0,219	-0,660
477	2017	Thylechateau	T3	17T3T7 rep2	prot	0,138	0,129	0,129	-0,888
478	2016	Ath	untreated	16TEA13	prot	0,233	0,165	0,165	-0,783
479	2016	Ath	untreated	16TEA24	prot	0,194	0,155	0,155	-0,810
480	2016	Thylechateau	untreated	16TET1	prot	0,153	0,117	0,117	-0,933
481	2016	Thylechateau	untreated	16TET10	prot	0,099	0,093	0,093	-1,032
482	2016	Thylechateau	untreated	16TET12	prot	0,126	0,118	0,118	-0,929
483	2016	Thylechateau	untreated	16TET15	prot	0,132	0,123	0,123	-0,909
484	2016	Thylechateau	untreated	16TET16	prot	0,124	0,116	0,116	-0,937
485	2016	Thylechateau	untreated	16TET18	prot	0,265	0,239	0,239	-0,622
486	2016	Thylechateau	untreated	16TET18	prot	0,261	0,218	0,218	-0,661

487	2016	Thylechateau	untreated	16TET20	prot	0,194	0,157	0,157	-0,805
488	2016	Thylechateau	untreated	16TET21	prot	0,122	0,100	0,100	-0,999
489	2016	Thylechateau	untreated	16TET3	prot	0,402	0,308	0,308	-0,512
490	2016	Thylechateau	untreated	16TET4	prot	0,186	0,143	0,143	-0,845
491	2016	Thylechateau	untreated	16TET6	prot	0,316	0,240	0,240	-0,620
492	2016	Thylechateau	untreated	16TET8	prot	0,281	0,213	0,213	-0,672
493	2017	Thylechateau	untreated	17TET1 rep1	prot	0,556	0,523	0,523	-0,281
494	2017	Thylechateau	untreated	17TET1 rep3	prot	0,145	0,130	0,130	-0,887
495	2017	Thylechateau	untreated	17TET2 rep2	prot	0,705	0,741	0,741	-0,130
496	2017	Thylechateau	untreated	17TET3 rep1	prot	0,220	0,187	0,187	-0,728
497	2017	Thylechateau	untreated	17TET3 rep3	prot	0,070	0,062	0,062	-1,208
498	2017	Thylechateau	untreated	17TET3 rep4	prot	0,020	0,014	0,020	-1,699
499	2017	Thylechateau	untreated	17TET4 rep2	prot	0,144	0,152	0,152	-0,820
500	2017	Thylechateau	untreated	17TET4 rep3	prot	0,170	0,152	0,152	-0,818
501	2017	Thylechateau	untreated	17TET5 rep2	prot	0,185	0,195	0,195	-0,710
502	2017	Thylechateau	untreated	17TET6 rep1	prot	0,896	0,809	0,809	-0,092
503	2017	Thylechateau	untreated	17TET6 rep3	prot	0,202	0,181	0,181	-0,743
504	2017	Thylechateau	untreated	17TET7 rep1	prot	0,742	0,645	0,645	-0,190
505	2017	Thylechateau	untreated	17TET7 rep2	prot	0,020	0,021	0,021	-1,677
506	2017	Thylechateau	untreated	17TET7 rep3	prot	0,663	0,585	0,585	-0,233
507	2017	Thylechateau	untreated	17TET8 rep1	prot	0,171	0,157	0,157	-0,805
508	2017	Thylechateau	untreated	17TET8 rep2	prot	0,330	0,347	0,347	-0,460
509	2008	Sart Risbart	baseline	16//08	tebu	1,847	1,699	1,699	0,230
510	2008	Sart Risbart	baseline	17//08	tebu	1,056	0,971	0,971	-0,013
511	2008	Sart Risbart	baseline	18//08	tebu	0,139	0,127	0,127	-0,894
512	2008	Sart Risbart	baseline	20//08	tebu	1,420	1,306	1,306	0,116
513	2008	Sart Risbart	baseline	26//08	tebu	0,438	0,403	0,403	-0,395
514	2008	Sart Risbart	baseline	27//08	tebu	2,731	2,512	2,512	0,400
515	2008	Sart Risbart	baseline	28//08	tebu	0,839	0,720	0,720	-0,143
516	2008	Sart Risbart	baseline	29//08	tebu	0,121	0,112	0,112	-0,952
517	2008	Sart Risbart	baseline	30//08	tebu	2,143	1,777	1,777	0,250
518	2008	Sart Risbart	baseline	34//08	tebu	2,336	2,039	2,039	0,309
519	2008	Sart Risbart	baseline	35//08	tebu	3,332	2,956	2,956	0,471
520	2008	Sart Risbart	baseline	36//08	tebu	3,431	3,044	3,044	0,483
521	2008	Corroy-le-Grand	baseline	38//08	tebu	1,268	1,108	1,108	0,045
522	2008	Corroy-le-Grand	baseline	39//08	tebu	21,528	18,514	18,514	1,267
523	2008	Corroy-le-Grand	baseline	40//08	tebu	1,800	1,558	1,558	0,193
524	2008	Corroy-le-Grand	baseline	41//08	tebu	2,146	1,904	1,904	0,280
525	2008	Corroy-le-Grand	baseline	42//08	tebu	2,702	2,398	2,398	0,380
526	2008	Corroy-le-Grand	baseline	43//08	tebu	0,968	0,858	0,858	-0,066
527	2008	Corroy-le-Grand	baseline	45//08	tebu	0,370	0,324	0,324	-0,490
528	2008	Corroy-le-Grand	baseline	47//08	tebu	4,775	4,990	4,990	0,698
529	2008	Corroy-le-Grand	baseline	48//08	tebu	0,020	0,021	0,021	-1,672

530	2008	Corroy-le-Grand	baseline	517//08	tebu	0,020	0,021	0,021	-1,672
531	2008	Corroy-le-Grand	baseline	52//08	tebu	1,698	1,808	1,808	0,257
532	2008	Corroy-le-Grand	baseline	54//08	tebu	6,670	6,991	6,991	0,845
533	2008	Corroy-le-Grand	baseline	55//08	tebu	1,528	1,627	1,627	0,211
534	2008	Corroy-le-Grand	baseline	56//08	tebu	1,279	1,361	1,361	0,134
535	2008	Corroy-le-Grand	baseline	57//08	tebu	0,020	0,021	0,021	-1,672
536	2008	Graux	baseline	58//08	tebu	1,074	1,143	1,143	0,058
537	2008	Graux	baseline	623//08	tebu	1,158	1,023	1,023	0,010
538	2017	Ireland	C3test	C3	tebu	4,921	8,204	8,204	0,914
539	2017	Ireland	C3test	C3	tebu	8,905	8,204	8,204	0,914
540	2017	Ireland	C3test	C3	tebu	7,105	8,204	8,204	0,914
541	2017	Ireland	C3test	C3	tebu	8,927	8,204	8,204	0,914
542	2017	Ireland	C3test	C3	tebu	9,938	8,204	8,204	0,914
543	2017	Ireland	C3test	C3	tebu	8,976	8,204	8,204	0,914
544	2017	Ireland	C3test	C3	tebu	7,724	8,204	8,204	0,914
545	2017	Ireland	C3test	C3	tebu	8,312	8,204	8,204	0,914
546	2017	Ireland	C3test	C3	tebu	10,943	8,204	8,204	0,914
547	2017	Ireland	C3test	C3	tebu	8,886	8,204	8,204	0,914
548	2017	Ireland	C3test	C3	tebu	8,710	8,204	8,204	0,914
549	2017	Ireland	C3test	C3	tebu	7,970	8,204	8,204	0,914
550	2017	Ireland	C3test	C3	tebu	10,035	8,204	8,204	0,914
551	2017	Ireland	C3test	C3	tebu	11,274	8,204	8,204	0,914
552	2017	Ireland	C3test	C3	tebu	8,873	8,204	8,204	0,914
553	2017	Ireland	C3test	C3	tebu	9,268	8,204	8,204	0,914
554	2016	Ath	T1	16T1A16	tebu	0,304	0,314	0,314	-0,503
555	2016	Ath	T1	16T1A22	tebu	0,563	0,553	0,553	-0,257
556	2016	Ath	T1	16T1A23	tebu	0,370	0,357	0,357	-0,447
557	2016	Thylechateau	T1	16T1T1	tebu	1,500	1,310	1,310	0,117
558	2016	Thylechateau	T1	16T1T12	tebu	2,260	1,878	1,878	0,274
559	2016	Thylechateau	T1	16T1T14	tebu	3,258	4,379	4,379	0,641
560	2016	Thylechateau	T1	16T1T15	tebu	0,403	0,526	0,526	-0,279
561	2016	Thylechateau	T1	16T1T16	tebu	0,526	0,685	0,685	-0,164
562	2016	Thylechateau	T1	16T1T18	tebu	0,310	0,403	0,403	-0,395
563	2016	Thylechateau	T1	16T1T19	tebu	0,831	1,126	1,126	0,052
564	2016	Thylechateau	T1	16T1T2	tebu	0,571	0,487	0,487	-0,312
565	2016	Thylechateau	T1	16T1T20	tebu	3,156	2,637	2,637	0,421
566	2016	Thylechateau	T1	16T1T7	tebu	0,474	0,403	0,403	-0,395
567	2016	Thylechateau	T1	16T1T8	tebu	0,630	0,488	0,488	-0,312
568	2016	Thylechateau	T1	16T1T9	tebu	3,336	2,814	2,814	0,449
569	2017	Thylechateau	T1	17T1T1 rep1	tebu	0,369	1,208	1,208	0,082
570	2017	Thylechateau	T1	17T1T1 rep2	tebu	0,925	0,935	0,935	-0,029
571	2017	Thylechateau	T1	17T1T2 rep1	tebu	1,798	2,491	2,491	0,396
572	2017	Thylechateau	T1	17T1T2 rep3	tebu	0,873	0,781	0,781	-0,108
573	2017	Thylechateau	T1	17T1T3 rep1	tebu	1,522	7,044	7,044	0,848

574	2017	Thylechateau	T1	17T1T3 rep2	tebu	0,332	0,331	0,331	-0,480
575	2017	Thylechateau	T1	17T1T3 rep3	tebu	1,751	1,601	1,601	0,204
576	2017	Thylechateau	T1	17T1T3 rep4	tebu	0,427	0,444	0,444	-0,352
577	2017	Thylechateau	T1	17T1T4 rep2	tebu	0,450	0,439	0,439	-0,358
578	2017	Thylechateau	T1	17T1T5 rep2	tebu	4,291	4,333	4,333	0,637
579	2017	Thylechateau	T1	17T1T6 rep1	tebu	1,743	2,926	2,926	0,466
580	2017	Thylechateau	T1	17T1T6 rep2	tebu	0,233	0,237	0,237	-0,626
581	2017	Thylechateau	T1	17T1T6 rep3	tebu	2,292	2,139	2,139	0,330
582	2017	Thylechateau	T1	17T1T8 rep3	tebu	0,300	0,281	0,281	-0,551
583	2017	Thylechateau	T1	17T1T9 rep3	tebu	4,554	4,266	4,266	0,630
584	2016	Ath	T2	16T2A23	tebu	0,363	0,391	0,391	-0,408
585	2016	Thylechateau	T2	16T2T1	tebu	0,521	0,396	0,396	-0,403
586	2016	Thylechateau	T2	16T2T12	tebu	3,513	3,103	3,103	0,492
587	2016	Thylechateau	T2	16T2T15	tebu	0,427	0,378	0,378	-0,423
588	2016	Thylechateau	T2	16T2T16	tebu	0,215	0,190	0,190	-0,721
589	2016	Thylechateau	T2	16T2T17	tebu	0,369	0,326	0,326	-0,486
590	2016	Thylechateau	T2	16T2T24	tebu	1,856	1,848	1,848	0,267
591	2016	Thylechateau	T2	16T2T3	tebu	1,023	0,786	0,786	-0,105
592	2016	Thylechateau	T2	16T2T4	tebu	0,794	0,639	0,639	-0,195
593	2016	Thylechateau	T2	16T2T6	tebu	0,461	0,356	0,356	-0,448
594	2016	Thylechateau	T2	16T2T9	tebu	0,870	0,769	0,769	-0,114
595	2017	Thylechateau	T2	17T2T1 rep1	tebu	0,684	0,506	0,506	-0,296
596	2017	Thylechateau	T2	17T2T1 rep2	tebu	0,296	0,248	0,248	-0,605
597	2017	Thylechateau	T2	17T2T1 rep3	tebu	12,439	11,270	11,270	1,052
598	2017	Thylechateau	T2	17T2T1 rep4	tebu	1,807	1,580	1,580	0,199
599	2017	Thylechateau	T2	17T2T2 rep1	tebu	0,582	0,425	0,425	-0,372
600	2017	Thylechateau	T2	17T2T2 rep2	tebu	0,525	0,440	0,440	-0,357
601	2017	Thylechateau	T2	17T2T2 rep4	tebu	1,871	2,054	2,054	0,313
602	2017	Thylechateau	T2	17T2T3 rep1	tebu	4,442	3,262	3,262	0,513
603	2017	Thylechateau	T2	17T2T3 rep2	tebu	1,055	0,884	0,884	-0,054
604	2017	Thylechateau	T2	17T2T3 rep3	tebu	5,436	5,016	5,016	0,700
605	2017	Thylechateau	T2	17T2T4 rep1	tebu	22,175	15,115	15,115	1,179
606	2017	Thylechateau	T2	17T2T4 rep2	tebu	0,439	0,368	0,368	-0,434
607	2017	Thylechateau	T2	17T2T4 rep3	tebu	1,513	1,378	1,378	0,139
608	2017	Thylechateau	T2	17T2T4 rep4	tebu	0,422	0,448	0,448	-0,349
609	2017	Thylechateau	T2	17T2T5 rep2	tebu	5,607	4,705	4,705	0,673
610	2017	Thylechateau	T2	17T2T5 rep3	tebu	0,648	0,588	0,588	-0,231
611	2017	Thylechateau	T2	17T2T6 rep3	tebu	2,192	1,992	1,992	0,299
612	2017	Thylechateau	T2	17T2T7 rep1	tebu	0,427	0,314	0,314	-0,502
613	2016	Ath	T3	16T3A21rf	tebu	4,772	4,779	4,779	0,679
614	2016	Thylechateau	T3	16T3T13	tebu	0,363	0,321	0,321	-0,494
615	2016	Thylechateau	T3	16T3T14	tebu	0,227	0,200	0,200	-0,698
616	2016	Thylechateau	T3	16T3T19a	tebu	0,371	0,367	0,367	-0,435
617	2016	Thylechateau	T3	16T3T19b	tebu	1,192	1,193	1,193	0,077
618	2016	Thylechateau	T3	16T3T2	tebu	0,275	0,221	0,221	-0,655

619	2016	Thylechateau	T3	16T3T20	tebu	0,475	0,472	0,472	-0,326
620	2016	Thylechateau	T3	16T3T4	tebu	0,324	0,245	0,245	-0,610
621	2016	Thylechateau	T3	16T3T5	tebu	2,750	1,983	1,983	0,297
622	2016	Thylechateau	T3	16T3T6	tebu	0,164	0,125	0,125	-0,904
623	2016	Thylechateau	T3	16T3T7	tebu	2,520	1,923	1,923	0,284
624	2016	Thylechateau	T3	16T3T8	tebu	0,369	0,351	0,351	-0,455
625	2016	Thylechateau	T3	16T3T8	tebu	0,475	0,443	0,443	-0,353
626	2016	Thylechateau	T3	16T3T9	tebu	0,064	0,057	0,057	-1,248
627	2017	Thylechateau	T3	17T3T1 rep1	tebu	0,634	0,467	0,467	-0,331
628	2017	Thylechateau	T3	17T3T1 rep2	tebu	4,980	4,175	4,175	0,621
629	2017	Thylechateau	T3	17T3T1 rep3	tebu	7,679	7,014	7,014	0,846
630	2017	Thylechateau	T3	17T3T2 rep1	tebu	0,440	0,319	0,319	-0,496
631	2017	Thylechateau	T3	17T3T2 rep2	tebu	0,462	0,387	0,387	-0,412
632	2017	Thylechateau	T3	17T3T2 rep3	tebu	0,679	0,615	0,615	-0,211
633	2017	Thylechateau	T3	17T3T2 rep4	tebu	0,478	0,507	0,507	-0,295
634	2017	Thylechateau	T3	17T3T3 rep1	tebu	0,459	0,340	0,340	-0,469
635	2017	Thylechateau	T3	17T3T3 rep3	tebu	0,199	0,176	0,176	-0,754
636	2017	Thylechateau	T3	17T3T3 rep4	tebu	0,431	0,454	0,454	-0,343
637	2017	Thylechateau	T3	17T3T4 rep1	tebu	0,401	0,294	0,294	-0,531
638	2017	Thylechateau	T3	17T3T4 rep2	tebu	0,157	0,132	0,132	-0,881
639	2017	Thylechateau	T3	17T3T4 rep3	tebu	0,626	0,572	0,572	-0,242
640	2017	Thylechateau	T3	17T3T4 rep4	tebu	5,730	5,995	5,995	0,778
641	2017	Thylechateau	T3	17T3T5 rep1	tebu	0,406	0,300	0,300	-0,523
642	2017	Thylechateau	T3	17T3T5 rep2	tebu	0,389	0,326	0,326	-0,487
643	2017	Thylechateau	T3	17T3T5 rep3	tebu	1,026	0,934	0,934	-0,030
644	2017	Thylechateau	T3	17T3T6 rep1	tebu	0,363	1,153	1,153	0,062
645	2017	Thylechateau	T3	17T3T7 rep2	tebu	0,460	0,385	0,385	-0,414
646	2016	Ath	untreated	16TEA13	tebu	0,702	0,754	0,754	-0,122
647	2016	Ath	untreated	16TEA24	tebu	5,223	5,369	5,369	0,730
648	2016	Thylechateau	untreated	16TET1	tebu	1,336	1,127	1,127	0,052
649	2016	Thylechateau	untreated	16TET10	tebu	0,181	0,243	0,243	-0,614
650	2016	Thylechateau	untreated	16TET12	tebu	0,251	0,331	0,331	-0,481
651	2016	Thylechateau	untreated	16TET15	tebu	0,438	0,577	0,577	-0,239
652	2016	Thylechateau	untreated	16TET16	tebu	0,543	0,702	0,702	-0,154
653	2016	Thylechateau	untreated	16TET18	tebu	1,569	1,868	1,868	0,271
654	2016	Thylechateau	untreated	16TET18	tebu	0,666	0,803	0,803	-0,095
655	2016	Thylechateau	untreated	16TET20	tebu	0,390	0,383	0,383	-0,417
656	2016	Thylechateau	untreated	16TET21	tebu	0,390	0,388	0,388	-0,411
657	2016	Thylechateau	untreated	16TET3	tebu	3,404	2,834	2,834	0,452
658	2016	Thylechateau	untreated	16TET4	tebu	0,524	0,433	0,433	-0,363
659	2016	Thylechateau	untreated	16TET6	tebu	0,464	0,400	0,400	-0,398
660	2016	Thylechateau	untreated	16TET8	tebu	0,344	0,293	0,293	-0,534
661	2017	Thylechateau	untreated	17TET1 rep1	tebu	0,929	2,754	2,754	0,440
662	2017	Thylechateau	untreated	17TET1 rep3	tebu	0,186	0,175	0,175	-0,756
663	2017	Thylechateau	untreated	17TET2 rep2	tebu	0,838	0,847	0,847	-0,072

664	2017	Thylechateau	untreated	17TET3 rep1	tebu	0,542	2,424	2,424	0,384
665	2017	Thylechateau	untreated	17TET3 rep3	tebu	0,192	0,186	0,186	-0,731
666	2017	Thylechateau	untreated	17TET3 rep4	tebu	2,647	2,338	2,338	0,369
667	2017	Thylechateau	untreated	17TET4 rep2	tebu	0,308	0,314	0,314	-0,503
668	2017	Thylechateau	untreated	17TET4 rep3	tebu	0,394	0,369	0,369	-0,433
669	2017	Thylechateau	untreated	17TET5 rep2	tebu	0,742	0,739	0,739	-0,131
670	2017	Thylechateau	untreated	17TET6 rep1	tebu	0,327	0,696	0,696	-0,158
671	2017	Thylechateau	untreated	17TET6 rep3	tebu	0,327	0,308	0,308	-0,511
672	2017	Thylechateau	untreated	17TET7 rep1	tebu	0,784	2,166	2,166	0,336
673	2017	Thylechateau	untreated	17TET7 rep2	tebu	3,852	3,912	3,912	0,592
674	2017	Thylechateau	untreated	17TET7 rep3	tebu	0,803	0,746	0,746	-0,127
675	2017	Thylechateau	untreated	17TET8 rep1	tebu	0,609	2,504	2,504	0,399
676	2017	Thylechateau	untreated	17TET8 rep2	tebu	5,782	5,842	5,842	0,767

Annexe 8 : Résultats de l'analyse statistique (établie sur 'R Studio') employés pour l'interprétation des résultats de la caractérisation *in vitro* de la sensibilité des souches de *Z. tritici* aux triazoles sur base des EC₅₀ en plaque multipuits

prothio en fonction de l'année dans les non traités

ANOVA

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
year	1	25.75	25.75	151.6	<2e-16 ***
Residuals	122	20.72	0.17		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

TUKEY

	log10.EC50c.corrected.2	groups
2017	-0.4768992	a
2016	-0.6826271	a
2009	-1.4272128	b
2008	-1.5056715	b

tebuclo en fonction de l'année dans les non traités

ANOVA

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
year	1	0.10	0.0988	0.246	0.621
Residuals	122	49.06	0.4022		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Prothio en fonction de l'année, de la localité et du traitement (2016-2017)

ANOVA

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
treatments	3	2.14	0.712	2.955	0.03332 *
site	1	7.36	7.356	30.517	9.03e-08 ***
year	1	1.93	1.931	8.011	0.00507 **
treatments:site	3	0.84	0.281	1.167	0.32299
treatments:year	3	0.48	0.160	0.664	0.57519
site:year	1	0.06	0.057	0.237	0.62696
treatments:site:year	3	0.20	0.065	0.271	0.84626
Residuals	227	54.71	0.241		

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

TUKEY (traitement)

	log10.EC50c.corrected.2	groups
T3	-0.5194525	a
T2	-0.5333521	ab
untreated	-0.5747043	ab
T1	-0.7535627	b

Tebuco en fonction de l'année, de la localité et du traitement (2016-2017)

ANOVA

	Df	Sum Sq	Mean Sq	F value	Pr(>F)	
treatments	3	2.80	0.932	2.971	0.0326	*
site	1	5.11	5.107	16.276	7.48e-05	***
year	1	0.94	0.935	2.980	0.0857	.
treatments:site	3	0.45	0.148	0.473	0.7013	
treatments:year	3	0.56	0.187	0.597	0.6175	
site:year	1	0.27	0.273	0.871	0.3518	
treatments:site:year	3	0.29	0.097	0.308	0.8194	
Residuals	227	71.23	0.314			

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1						

TUKEY (traitement)

	log10.EC50c.corrected.2	groups
T2	0.13438872	a
T1	0.13097114	a
untreated	0.08618163	a
T3	-0.12522034	a

Annexe 9 : Résumé des données moléculaires obtenues pour chaque souche séquencée avec la longueur et la qualité de chaque séquence de nucléotides, la taille du contig formé et le pourcentage de query cover et d'identité de la totalité du gène CYP51 obtenu par rapport à la séquence sujet sur GenBank (BLAST®)

N° Souches	Taille de chaque séquence ¹ (BPs)			Qualité de la séquence ²			Taille contig (BPs)	Query cover ³	Identity ⁴
	F1	F2	F3	F1	F2	F3			
10/08	1828	1216	824	97,2%	43,6%	90,6%	-	-	-
126/09	1638	753	847	99,3%	11,7%	99,5%	-	-	-
16T1A6	-	-	-	-	-	-	2015	94%	99%
16T1A10	1614	1436	849	96,7%	99,2%	99,5%	1976	96%	99%
16T2A19	1602	1424	844	98,1%	99,2%	99,7%	1975	96%	99%
16T3T19a	1729	1389	846	99,2%	99,5%	99,5%	1978	96%	99%
16T1A2	1680	1509	846	95,6%	99,6%	99,2%	2012	94%	99%
16T1A15	1455	1329	1140	99,3%	99,4%	99,0%	1980	96%	99%
16T3A2	1627	1303	841	98,5%	95,8%	96,4%	1973	96%	99%
16T3A7	1904	1448	855	99,0%	97,8%	99,5%	1973	96%	99%
16TEA19	1857	1550	1259	84,5%	98,9%	99,2%	2006	95%	99%
16T1T14	1612	1131	845	96,8%	25,6%	99,5%	-	-	-
16T3T20	1003	756	863	98,1%	21,2%	99,5%	-	-	-
17T3T1 rep2	1655	1455	856	99,3%	97,4%	99,7%	1973	96%	99%
17T3A5 rep2	1761	1428	844	98,6%	99,3%	99,0%	1979	96%	99%
17T2A5 rep2	1673	1428	864	94,6%	99,8%	98,8%	1967	97%	99%
17T2A1 rep1	1643	1422	851	99,5%	99,7%	98,7%	1988	98%	99%
17T1A11 rep4	1795	1472	849	99,5%	99,8%	99,4%	1974	96%	99%
17TEA4 rep3	1821	1405	842	98,8%	99,2%	93,1%	1998	95%	99%
17T2T6 rep3	1770	1210	829	99,8%	99,1%	98,8%	1971	96%	99%
17T2T5 rep2	1863	1435	851	97,9%	96,8%	99,5%	1969	96%	99%
17T1T6 rep1	1675	1461	847	74,3%	99,6%	98,0%	2015	94%	97%
17T3A6 rep3	1596	1339	759	98,8%	99,8%	26,4%	-	-	-
17T2T3 rep3	1888	1405	840	97,0%	99,3%	34,8%	1995 ⁵	-	-
17T2A17 rep4	1696	970	843	99,1%	27,0%	99,5%	-	-	-
17T2A3 rep4	1222	925	1047	99,1%	98,8%	99,7%	1895	99%	99%
17TEA3 rep1	1203	-	-	99,6%	-	-	-	-	-

¹ Fait référence à la taille originale de la séquence.

² La qualité de chaque séquence est évaluée après avoir coupé les extrémités ne faisant plus partie de la séquence originale.

³ Pourcentage de la séquence qui chevauche la séquence sujet sur GenBank (BLAST®).

⁴ Pourcentage de similarité entre la séquence et les séquences sujets sur la longueur de la zone de couverture.

⁵ Un contig a su être formé mais la troisième partie possède une séquence de trop mauvaise qualité donc trop difficilement observable et non fiable.

- Aucune information n'a pu être obtenue pour cause d'une mauvaise qualité de la séquence ou dû à un séquençage non effectué.

Annexe 10 : Séquences nucléotidiques du gène CYP51 des souches de *Z. tritici* de 2008-2009, de 2016 et de 2017

1) Séquences nucléotidiques du gène CYP51 des souches de *Z. tritici* de 2008-2009

>10/08

>10-08 (juste amorce 1, trim tout)

CATTGACATCACAATGGGTCTCCTCCAGGAAGTCCTCGCGCAGTTCGACGCGCAATTCGGCCAGACCAGCCTCTGGAAACT
TGTCGGACTTGGAATTCCTCGCCTTCAGCACGCTCGCCATCCTCCTCAATGTCTCTCACAACCTCTCTTCCGTGGCAAGTTGT
CCGATCCGCCACTCGTGTCCACTGGGTGCCCTTCATCGGAAGCACCATCACCTACGGCATCGACCCATACAAGTTCTTCTT
CTCCTGTCGGGAAAAGTATGGAGATGTCTTTACATTCATCCTGCTGGGAAAGAAGACGACGGTGTGCTTGGGCACCAAGG
GCAATGATTTTATTTGAATGGAAAAGTGAAGGACGTCAACGCGGAGGAGATATACAGCCCTCTGACCACTCCTGTCTTTG
GCAAGGGTGTGGCTTATGATTGTCCCAATTCGAAGCTCATGGAGCAGAAGAAGGTACGGAGAATTGAGAACATACGGGC
AAGAGTGCAGCATATTGACTTGTCACTTAGTTCGTCAAGTACGGCCTCACAACCTCCGCCCTCCAGTCTACGTGACCTTGA
TCGCCGCCGAGACCCGACAGTTTTTCGACCGTAATAATCCACACAAGAAGTTCGCATCGACGAACGGTACCATCGATCTCC
CACCAGCCCTCGCCGAACCTACGATCTATACTGCCAGCCGATCATTGCAAGGAAAGGAAGTCCGCGAGGGCTTCGACTCG
TCTTCGCGGACCTCTACCACTACCTCGATATGGGATTACACCGATCAACTTTATGCTTCCGTGGGCGCCCCCTTCCCC

>10-08 (juste amorce 3, trim tout)

ATCACTCTCCGCTCGCATCCCGCCCCGACATCCAAGACGAACTCCTCCAAGAACAAAAGGATATGCTCGGTGTGAACGCC
GACGGCAGTATCAAGGAGCTCACATACGCCAACCTCTCGAACTCACCTCCTCAATCAAGTCGTCAAAGAAACCTTCGT
ATTCACGCTCCAATCCACTCCATTCTGCGCAAGGTCAAGTCTCCCATGCCATCGAAGGTACGGCATACTGTCATTCCAACCA
CCCACACTCTTCTGGCCGCTCCGGGCACAACGAGCCGATGGACGAGCACTTCCCGACTGCCTCCATTGGGAGCCGCATC
GATGGGACGAGAGCCCGTCCGAGAAATACAAGCACCTGTCCCCGACGACTGCCCTAGGAAGCATCGCCGAGGAGAAAGA
AGACTATGGCCTGGTAAGCAAGGGCGCGGCGTGCCTACTTACCCTTTGGTGCGGGACGACACAGATGTATCGGCGAG
CAATTCGCGTACGTGCAATTGCAGACCATTACAGCGACGATGGTTCGCGATTCAAGTTTTACAATGTGGATGGCAGCGAC
AACGTGGTGGGTACGGATTACAGCAGTTTGTTCAGCCGGCCGCTGTGCGCGGACAGTAGTAAAGTGGGAGAGGAGGGAG
GAGAAGGAGGAGAAGAAGTGAAGTGAAGACTTGGTGTGGGTATGCAGAACCATAGGTGGATCTTATGCTAATGAATAG
C

>126/09

>126/09 (juste amorce 1, trim tout)

TTGACATCACAATGGGTCTCCTCCAGGAAGTCCTCGCGCAATTCGACGCGCAATTCGGCCAGACCAGCCTCTGGAAACTTG
TCGGACTTGGAATTCCTCGCCTTCAGCACGCTCGCCATCCTCCTCAATGTCTCTCACAACCTCTCTTCCGTGGCAAGTCGTCC
GATCCGCCACTCGTGTCCACTGGGTGCCCTTCATCGGAAGCACCATCACCTACGGCATCGACCCATACAAGTTCTTCTTCT
CCTGTCGGGAAAAGTATGGAGATGTCTTTACATTCATCCTGCTGGGAAAGAAGACGACGGTGTGCTTGGGCACCAAGGGC
AATGATTTTATTTGAATGGAAAAGTGAAGGACGTCAACGCGGAGGAGATATACAGCCCTCTGACCACTCCTGTCTTTGGC
AAGGATGTGGTTTATGATTGTCCCAATTCGAAGCTCATGGAGCAGAAGAAGGTACGGAGAATTGAGAACATACGGGCAA
GAGTGCAGCATATTGACTTGTCACTTAGTTCGTCAAGTACGGCCTCACAACCTCCGCCCTCCAGTCTACGTGACCTTGATC
GCCGCCGAGACCCGCCAGTTTTTCGACCGTAATAATCCACACAAGAAGTTCGCATCGACGAACGGTACCATCGATCTCCA
CCAGCCCTCGCCGAACCTACGATCTATACTGCCAGCCGATCATTGCAAGGAAAGGAAGTCCGCGAGGGCTTCGACTCGTCT
TTCGCGGACCTCTACCACTACCTCGATATGGGATTACACCGATCAACTTTATGCTTCCGTGGGCGCCCCCTTCCACAGAACC
GACGCCGCGATTATGCGCAGAAGAAGATGTCCGAGACATACATGTGATCATTGAGAAGAGACGAGAGTCCAAAACGGG
CGAACACGAGGAAGACAGTAAGTGAAGTCAGGCACAGGAGGCGTCCAGCTCTCGGAGTCTTGCAAGTTGGCCTGTTAGTG
GCCATGACATCGCCGAGCATTTGCTAACGTCTTGTACCATCAGTGATCCACAACCTTGATGCAGTTAGTAAAGTCACAAGC

>126/09 (juste amorce 3, trim tout)

CATGGCCGGCCAGCACTCTTCATCTGCGACCGAGTCTGGATCACTCTCCGCCTTGATCCCGCCCCGACATCCAAGACGA
ACTCCTCCAAGAACAAAAGGATATGCTCGGTGTGAACGCCGACGGCAGTATCAAGGAGCTCACATACGCCAACCTCTCGA
AACTACCCCTCCTCAATCAAGTCGTCAAAGAAACCTTCGTATTACGGTCCAGTCCACTCCATTCTGCGCAAGGTCAAGTC

TCCCATGCCCATCGAAGGTACGGCATACTGTCATTCCAACCACCCACACTCTTCTGGCCGCTCCGGGCACAACGAGCCGCAT
GGACGAGCACTTTCCCGACTGCCTCCATTGGGAGCCGCATCGATGGGACGAGAGCCCGTCCGAGAAATACAAGCACCTGT
CCCCGACGACTGCCCTAGGAAGCATCGCCGAGGAGAAAGAAGACTACGGCCTTGTAAGCAAGGGCGCGGCGTCGCCATA
CTTACCCTTTGGTGCAGGACGACAGATGTATCGGCGAGCAATTCGCGTACGTGCAATTGCAGACCATTACAGCGACGA
TGGTTCGCGATTTCAAGTTTTACAATGTGGATGGCAGCGACAAGGTGGTGGGTACGGATTACAGCAGTTTGTTCAGCCGG
CCGCTGTCGCCGGCAGTAGTGAAGTGGGAGAGGAGGGAGGAGAAGGAGGAAAAGAACTGAAGTGAAGAATTGGTGT
GGGTATGCAGAACCATAGGTGGATCTTATGCTAATGAATAGCGC

2) Séquences nucléotidiques du gène CYP51 des souches de *Z. tritici* de 2016

>16T1A6

GCGAGCAGCAGCACTCCATGCATTGTACTCCCGGCAGTCATCTGTCGCAATATGGGTCTCCTCCAGGAAGTCCTCGCGCAGT
TCGCCGCGCAATTCGGCCAGACCAGCCCTGAAACTTGTGCGACTTGGATTCTCGCCTTCAGCACGCTCGCCATCCTCCTC
AATGTCCTCTCACAACCTTCTCTCCGTGGCAAGTTGTCGATCCGCCACTCGTATTCCACTGGGTGCCCTTCATCGGAAGCA
CCATCACCTACGGCATCGACCCATACAAGTTCTTCTCTCTGTCGGGAAAAGTATGGAGATGTCTTTACATTATCCTGCT
GGGAAAGAAGACGACGGTGTGCTTGGGCACCAAGGGCAATGATTTATTTATGAATGGAAAAGTGAAGGACGTCAACGC
GGAGGAGAATACAGCCCGTGAACCTCTGTCTTTGGCAAGGTGTGGCTTATGATTGTCCCAATTCGAAGTCATGGA
GCAGAAGAAGGTACGGAGAATTGAGAACATACGGGCAAAAGTGCAGCTATATTGACTTGTCACTTAGTTCGTCAAGTACG
GCCTCACAACCTCTGCCCTCCAGTCTACGTGACCTTGATCGCCGCCGAGACCCGCCAGTTCTTCGACCGCAACAACCTCA
TAAGAAGTTCGCATCGACAGCGGCACGATCGATCTCCACAGCCCTCGCCGAACCTACGATCTATACTGCCAGCCGATC
ATTGCAAGGAAAGGAAGTCCGCGAGGGCTTCGACTCGTCTTTCGCGGACCTCTACCACTACCTCGATATGGGATTACACC
GATCAACTTTATGCTTCCGTGGGCGCCCTTCCCCAGAACCGACGCCGCGATTATGCGCAGAAGAAGATGTCCGAGACATA
CATGTGATCATTAGAAGAGACGAGAGTCCAAAACGGGCGAACATGAGGAAGACAGTAAGTGAAGTCAGGCACAGGA
GGCGTCCAGCTCTCGGAGTCTTGCAAGTTGGCCTGTTAGTGGCCATGACATCGCCGAGCATTGCTAACGTCTTGATACCATC
AGTGATCCACAACCTTGATGCAAGTTAGTAAAGTCACAAGCAGAAGGCGTGCAGATACAGTGTGCCACGCGTGTCCACGG
CCATGCGGCCCAAGTTCTCCTCGGAGACGATGCTGACCCTCGACTTCTAGGTGCAAATACAAGGACGGCAATGCCATTCC
CGACAAGGAGATTGCTCATATGATGATTGCGCTGCTCATGGCCGGCCAGCACTTCTCATCTGCGACCGAGTCTGGATCAC
TCTCCGCTCGCATCCCGCCCCGACATCCAAGACGAACTCTCCAAGAACAAAAGGATATGCTCGGTGTGAACGCCGACGG
CAGTATCAAGGAGCTCACATACGCCAACCTCTCGAAACTCACCTCCTCAATCAAGTCGTCAAAGAAACCTTCGTATTAC
GCTCCAGTCCACTCCATTCTGCGCAAGGTCAAGTCTCCATGCCATCGAAGGTACGGCATAACGTCATTCCAACCAACCCACA
CTTTCTGGCCGCTCCGGGCACAACGAGCCGCATGGACGAGCACTTTCCCGACTGCCTCCATTGGGAGCCGCATCGATGG
GACGAGAGCCCGTCCGAGAAATACAAGCACCTGTCCCCGACGACTGCCCTAGGAAGCATCGCCGAGGAGAAAGAAGACT
ATGGCCACGGCCTGGTAAGCAAGGGCGCGGCGTGCACATACTTACCCTTTGGTGCAGGACGACACAGATGTATCGGCGA
GCAATTCGCGTACGTGCAATTGCAGACCATTACAGCGACGATGGTTTCGCGATTTCAAGTTTTACAATGTGGATGGCAGCGA
CAACGTGGTGGGTACGGATTACAGCAGTTTGTTCACCCGGCCGCTGTGCGCGGAGTAGTGAAGTGGGAGAGGAGGGAA
GGAAAAGGAAGGAAAAGAACTGAAGTGAAGAATTGGTGTGGGTATGCAGAACCATAGGTGGATCTTATGCTAATGAT
A

>16T1A10

TTGACATCACAATGGGTCTCCTCCAGGAAGTCCTCGCGCAATTCGACGCGCAATTCGGCCAGACCAGCCTCTGGAAACTTG
TCGGACTTGGATTCTCGCCTTCAGCACGCTCGCCATCCTCCTCAATGTCTCTCACAACCTTCTCTCCGTGGCAAGTCGTCC
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>16T1A2 (pas trim 5' de l'amorce 1)

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>16T3A2 (modification sequencer)

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>16T3A7 (modification sequencer)

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>16TEA19 (pas trim 5' de l'amorce 1 + modification sequencher)

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>16T1T14

>16T1T14 (juste amorce 1, pas trim 5')

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> 16T1T14 (juste amorce 3, trim tout)

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>16T3T20

>16T3T20 (juste amorce 1, trim tout)

ATTGACATCACAATGGGTCTCCTCCAGGAAGTCTCGCGCAATTCGACGCGCAATTCGGCCAGACCAGCCTCTGGAACTT
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CGATCCGCCACTCGTGTTCCTGCTGGGTGCCCTTCATCGGAAGCACCATCACCTACGGCATCGACCCATACAAGTTCTTCTC
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>16T3T20 (juste amorce 3, trim tout)

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3) Séquences nucléotidiques du gène CYP51 des souches de *Z. tritici* de 2017

>17T3T1 rep2 (modification sequencher)

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>17T3A5 rep2

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>17T2A5 rep2 (modification sequencer)

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>17T2A1 rep1

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>17T1A11 rep4

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>17TEA4 rep3 (modification sequencer)

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>17T2T6 rep3

>17T2T5 rep2 (modification sequencer)

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>17T1T6 rep1 (pas trim 5' de l'amorce 1 et de nucléotide 1 à 366 c'est la référence car impossible à lire)

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CAATCAAGTCGTCAAAGAAACCTTCGTATTACGCTCCAGTCCACTCCATTCTGCGCAAGGTCAAGTCTCCCATGCCATC
GAAGGTACGGCATACTGTCATTCCAACCAACCCACACTCTTCTGGCCGCTCCGGGCACAACGAGCCGCATGGACGAGCACTTT
CCCGACTGCCTCATTGGGAGCCGCATCGATGGGACGAGAGCCCGTCCGAGAAATACAAGCACCTGTCCCCGACGACTGC
CCTAGGAAGCATCGCCGAGGAGAAAGAAGACTATGGCCACGGCCTGGTAAGCAAGGGCGCGGCGTCCGCTACTTACCC
TTTGGTGCGGGACGACACAGATGTATCGGCGAGCAATTCGCGTACGTGCAATTGCAGACCATTACAGCGACGATGGTTCG
CGATTTCAGTTTTACAATGTGGATGGCAGCGACAACGTGGTGGGTACGGATTACAGCAGTTTGTTCACCCGGCCGCTGTC
GCCGGCAGTAGTGAAGTGGGAGAGGAGGGAAGGAAAAAGGAAGGAAAAAGAACTGAAGTGAAGAATTGGTGTGGGTA
TGCAGAACCATAGGTGGATCTTATGCTAATGATA

>17T3A6 rep3

>17T3A6 rep3 (juste amorce1, trim tout)

ATCACAATGGGTCTCCTCCAGGAAGTCCTCGCGCAATTCGACGCGCAATTCGGCCAGACCAGCCTCTGGAAACTTGTCCGA
CTTGGATTCTCGCCTTCAGCACGCTCGCCATCCTCCTCAATGTCCTCTCACAACCTTCTTCCGTGGCAAGTCGTCCGATCC
GCCACTCGTGTTCCACTGGGTGCCCTTCATCGGAAGCACCATCACCTACGGCATCGACCCATACAAGTTCTTCTCTCTGT
CGGGAAAAGTATGGAGATGTCTTTACATTCATCTGCTGGGAAAGAAGACGACGGTGTGCTTGGGCACCAAGGGCAATG
ATTTTATTTGAATGGAAAAGTGAAGGACGTCAACGCGGAGGAGATATACAGCCCGCTGACCACTCCTGTCTTTGGCAAG
GGTGTGGCTTATGATTGTCCCAATTGAAGTCTATGGAGCAGAAGAAGGTACGGAGAATTGAGAACATACGGGCAAAAG
TGCAGCTATATTGACTTGTCACTTAGTTCGTCAAGTACGGCCTCACAACCTCTGCCCTCCAGTCTACGTGACCTTGATCGCC
GCCGAGACCCGCCAGTTCTTCGACCGCAACAACCTCATAAGAAGTTCGCATCGACCAGCGGCACGATCGATCTCCACCA
GCCCTCGCCGAACCTACGATCTATACTGCCAGCCGATCATTGCAAGGAAAGGAAGTCCGCGAGGGCTTCGACTCGTCTTC
GCGGACCTTACCACTACCTCGATATGGGATTACACCGATCAACTTTATGCTTCCGTGGGCGCCCCCTTCCACAGAACCGAC
GCCGCGATTATGCGCAGAAGAAGATGTCCGAGACATACATGTCGATCATTGAGAAGAGACGAGAGTCCAAAACGGGCGA
ACACGAGGAAGACAGTAAGTGAAGTCAGGCACAGGAGGCGTCCAGTCTCGGAGTCTTGCAAGTTGGCCTGTTAGTGGCC
ATGACATCGCCGAGCATTGCTAACGTCTTGTACCATCAGTGATCC

>17T3A6 rep3 (juste amorce 2, trim tout + modification sequencher)

CTCCCACCAGCCCTCGCCGAACCTACGATCTATACTGCCAGCCGATCATTGCAAGGAAAGGAAGTCCGCGAGGGGCTTCGAC
TCGCTTTTCGCGGACCTCTACCACTACCTCGATATGGGATTACACCGATCAACTTTATGCTTCCGTGGGCGCCCTTCCACA
GAACCGACGCCGCGATTATGCGCAGAAGAAGATGTCCGAGACATACATGTCGATCATTGAGAAGAGACGAGAGTCCAAA
ACGGGCGAACACGAGGAAGACAGTAAGTGAAGTCAGGCACAGGAGGCGTCCAGCTCTCGGAGTCTTGCAAGTTGGCCTGT
TAGTGGCCATGACATCGCCGAGCATTGCTAACGTCTTGACCATCAGTGATCCACAACCTTGATGCAGTTAGTAAAGTCAC
AAGCAGAAGGCGTGAGATACAGTGTTGCCACGCGTGTCCACGGCCATGCGGCCAAGTTCCTCCCTGGAGACGATGCT
GACCCTCGACTTCTAGGTGCAAATACAAGGACGGCAATGCCATTCCCGACAAGGAGATTGCTCATATGATGATTGCGCTGC
TCATGGCCGGCCAGCACTCTTCATCTGCGACCGAGTCTGGATCACTCTCCGCTTGATCCCGCCCCGACATCCAAGACGA
ACTCCTCAAAGAACAAAAGGATATGCTCGGTGTGAACGCCGACGGCAGTATCAAGGAGCTCACATACGCCAACCTCTCGA
AACTCACCTCTCAATCAAGTCGTCAAAGAAACCTTCGTATTACGGTCCAGTCCACTCCATTCTGCGCAAGGTCAAGTC
TCCCATGCCCATCGAAGGTACGGCATACTGTCATTCCAACCCACCACTCTTCTGGCCGCTCCGGGCACAACGAGCCGCAT
GGACGAGCACTTTCCGACTGCCTCCATTGGGAGCCGCATCGATGGGACGAGAGCCCGTCCG

>17T2T3 rep3

>17T2T3 rep3 (juste amorce 1, pas trim 5' + modification sequencher)

TCGCAACTCCTCTGTGCCATTTCTCCCGACATTGACATCCACAATGGGTCTCCTCCAGGAAGTCTCGCGCAATTCGACGC
GCAATTCGGCCAGACCAGCCTCTGGAAACTTGTGGACTTGGAATCCTCGCCTTCAGCACGCTCGCCATCCTCCTCAATGTC
CTCTACAACCTCTCTCCGTGGCAAGTCGTCCGATCCGCCACTCGTGTCCACTGGGTGCCCTTCATCGGAAGCACCATCA
CCTACGGCATCGACCCATACAAGTTCTTCTCTCTGTCGGGAAAAGTATGGAGATGTCTTTACATTCATCTGCTGGGAAA
GAAGACGACGGTGTGCTTGGGCACCAAGGGCAATGATTTTATTTGAATGGAAAAGTGAAGGACGTCAACGCGGAGGAG
ATATACAGCCCCGTGACCACTCCTGTCTTTGGCAAGGGTGTGGCTTATGATTGTCCCAATTCGAAGCTCATGGAGCAGAAG
AAGGTACGGAGAATTGAGAACATACGGGCAAAAGTGCAGCTATATTGACTTGTCACTTAGTTCGTCAAGTACGGCCTCAC
AACCTCTGCCCTCCAGTCTACGTGACCTTGATCGCCGCCGAGACCCGCCAGTTCCTCGACCGCAACAACCTCATAAGAA
GTTTCGCATCGACAGCGGCACGATCGATCTCCACCAGCCCTCGCCGAACCTACGATCTATACTGCCAGCCGATCATTGCA
AGGAAAGGAAGTCCGCGAGGGCTTCGACTCGTCTTTCGCGGACCTTACCACTACCTCGATATGGGATTACACCGATCAA
CTTTATGCTTCCGTGGGCGCCCTTCCCCAGAACCAGCGCCGCGATTATGCGCAGAAGAAGATGTCCGAGACATACATGTC
GATCATTGAGAAGAGACGAGAGTCCAAAACGGGCGAACATGAGGAAGACAGTAAGTGAAGTCAGGCACAGGAGGCGTC
CAGCTCTCGGAGTCTTGCAAGTTGGCCTGTTAGTGGCCATGACATCGCCGAGCATTGCTAACGTCTTGTAACATCAGTGATC
CACAACCTGATGCAGTTAGTAAAGTCACAAGCAGAAGGCGTGAGATACAGTGTTGCCACGCGTGTCCACGGCCATGCG
GCCAAGTTCCTCCCTGG

>17T2T3 rep3 (juste amorce 2, trim tout)

CCAGCCCTCGCCGAACCTACGATCTATACTGCCAGCCGATCATTGCAAGGAAAGGAAGTCCGCGAGGGGCTTCGACTCGTCT
TTCGCGGACCTCTACCACTACCTCGATATGGGATTACACCGATCAACTTTATGCTTCCGTGGGCGCCCTTCCCCAGAACC
GACGCCGCGATTATGCGCAGAAGAAGATGTCCGAGACATACATGTCGATCATTGAGAAGAGACGAGAGTCCAAAACGGG
CGAACATGAGGAAGACAGTAAGTGAAGTCAGGCACAGGAGGCGTCCAGCTCTCGGAGTCTTGCAAGTTGGCCTGTTAGTG
GCCATGACATCGCCGAGCATTGCTAACGTCTTGTAACCATCAGTGATCCACAACCTTGATGCAGTTAGTAAAGTCACAAGCA
GAAGGCGTGAGATACAGTGTTGCCACGCGTGTCCACGGCCATGCGGCCAAGTTCCTCCCTGGAGACGATGCTGACCC
TCGACTTCTAGGTGCAAATACAAGGACGGCAATGCCATTCCCGACAAGGAGATTGCTCATATGATGATTGCGTGCTCATG
GCCGGCCAGCACTCTTCATCTGCGACCGAGTCTGGATCACTCTCCGCTCGCATCCCGCCCCGACATCCAAGACGAACTCC
TCCAAGAACAAAAGGATATGCTCGGTGTGAACGCCGACGGCAGTATCAAGGAGCTCACATACGCCAACCTCTCGAACTC
ACCTCCTCAATCAAGTCGTCAAAGAAACCTTCGTATTACGCTCCAGTCCACTCCATTCTGCGCAAGGTCAAGTCTCCCA
TGCCCATCGAAGGTACGGCATACTGTCATTCCAACCCACCACTCTTCTGGCCGCTCCGGGCACAACGAGCCGCATGGACG
AGCACTTTCCGACTGCCTCCATTGGGAGCCGCATCGATGGGACGAGAGCCCGTCCGAGAAATACAAGCACTGTCCCCG
ACGACTGCCCTAGGAAGCATCGCCGAGGAGAAAGAAGACTATGGCCACGGCCTGGTAAGCAAGGGCGCGGCGTCCCAT
ACTTACC

>17T2A17 rep4

>17T2A17 rep4 (juste amorce 1, trim tout)

CACAATGGGTCTCCTCCAGGAAGTCTCGCGCAATTCGACGCGCAATTCGGCCAGACCAGCCTCTGGAACTTGTCGGACT
TGGATTCTCGCCTTCAGCACGCTCGCCATCCTCCTCAATGTCCTCTCAAACTTCTTCCGTGGCAAGTCGTCCGATCCGC
CACTCGTGTTCCACTGGGTGCCCTTCATCGGAAGCACCATCACCTACGGCATCGACCCATACAAGTTCTTCTCTCTGTGC
GGAAAAGTATGGAGATGTCTTTACATTATCCTGCTGGGAAAGAAGACGACGGTGTGCTTGGGCACCAAGGGCAATGATT
TTATTTTGAATGGAAACTGAAGGACGTCAACGCGGAGGAGATATACAGCCCTCTGACCACTCCTGTCTTTGGCAAGGAT
GTGTGTTATGATTGTCCCAATTCGAAGCTCATGGAGCAGAAGAAGGTACGGAGAATTGAGAACATACGGGCAAGAGTGC
AGCATATTGACTTGCTCACTTAGTTCGTAAGTACGGCCTCACAACCTCCGCCCTCCAGTCTACGTGACCTTGATCGCCGCC
GAGACCCGCCAGTTTTTCGACCGTAATAATCCACACAAGAAGTTCGCATCGACGAACGGTACCATCGATCTCCACCAGCC
CTCGCCGAACCTACGATCTATACTGCCAGCCGATCATTGCAAGGAAAGGAAGTCCGCGAGGGCTTCGACTCGTCTTTCGCG
GACCTCTACCACTACCTCGATATGGGATTACACCGATCAACTTTATGCTTCCGTGGGCGCCCCTCCACAGAACCAGCGCC
GCGATTATGCGCAGAAGAAGATGTCCGAGACATACATGTCGATCATTGAGAAGAGACGAGAGTCCAAAACGGGCGAACA
CGAGGAAGACAGTAAGTGAAGTCAGGCACAGGAG

>17T2A17 rep4 (juste amorce 3, trim tout)

TGATTGCGCTGCTCATGGCCGGCCAGCACTCTTCATCTGCGACCGAGTCTGGATCACTCTCCGCTTGATCCCGCCCCGA
CATCCAAGACGAACTCTCCAAGAACAAAGGATATGCTCGGTGTGAACGCCGACGGCAGTATCAAGGAGCTCACATACG
CCAACCTCTCGAACTCACCTCCTCAATCAAGTCGTCAAAGAAACCTTCGTATTACGGTCCAGTCCACTCCATTCTGCGC
AAGGTCAAGTCTCCCATGCCATCGAAGGTACGGCATACTGTCATTCCAACCAACCCACACTCTTCTGGCCGCTCCGGGCACA
ACGAGCCGCATGGACGAGCACTTTCCGACTGCCTCCATTGGGAGCCGCATCGATGGGACGAGAGCCCGTCCGAGAAATA
CAAGCACCTGTCCCGACGACTGCCCTAGGAAGCATCGCCGAGGAGAAAGAAGACTACGGCCTTGTAAGCAAGGGCGCG
GCGTCGCCATACTTACCTTTGGTGCGGGACGACACAGATGTATCGGCGAGCAATTCGCGTACGTGCAATTGCAGACCATT
ACAGCGACGATGGTTCGCGATTCAAGTTTTACAATGTGGATGGCAGCGACAACGTGGTGGGTACGGATTACAGCAGTTT
GTTACCCCGGCCGCTGTGCGCGGAGTAGTGAAGTGGGAGAGGAGGGAGGAGAAAGGAGGAAAAGAACTGAAGTGGAA
GAATTGGTGTGGGTATGCAGAACCATAGGTGGATCTTATGCTAATGAATA

>17T2A3 rep4

CACAATGGGTCTCCTCCAGGAAGTCTCGCGCAATTCGACGCGCAATTCGGCCAGACCAGCCTCTGGAACTTGTCGGACT
TGGATTCTCGCCTTCAGCACGCTCGCCATCCTCCTCAATGTCCTCTCAAACTTCTTCCGTGGCAAGTCGTCCGATCCGC
CACTCGTGTTCCACTGGGTGCCCTTCATCGGAAGCACCATCACCTACGGCATCGACCCATACAAGTTCTTCTCTCTGTGC
GGAAAAGTATGGAGATGTCTTTACATTATCCTGCTGGGAAAGAAGACGACGGTGTGCTTGGGCACCAAGGGCAATGATT
TTATTTTGAATGGAAACTGAAGGACGTCAACGCGGAGGAGATATACAGCCCGCTGACCACTCCTGTCTTTGGCAAGGGT
GTGGCTTATGATTGTCCCAATTCGAAGCTCATGGAGCAGAAGAAGGTACGGAGAATTGAGAACATACGGGCAAAAGTGC
AGCTATATTGACTTGCTCACTTAGTTCGTAAGTACGGCCTCACAACCTCTGCCCTCCAGTCTACGTGACCTTGATCGCCGC
CGAGACCCGCCAGTTCTTCGACCGCAACAACCTCATAAGAAGTTCGCATCGACCAGCGGCACGATCGATCTCCACCAGC
CCTCGCCGAACCTACGATCTATACTGCCAGCCGATCATTGCAAGGAAAGGAAGTCCGCGAGGGCTTCGACTCGTCTTTCGC
GGACCTCTACCACTACCTCGATATGGGATTACACCGATCAACTTTATGCTTCCGTGGGCGCCCCCTCCCCAGAACCGACGC
CGCGATTATGCGCAGAAGAAGATGTCCGAGACATACATGTCGATCATTGAGAAGAGACGAGAGTCCAAAACGGGCGAAC
ATGAGGAAGACAGTAAGTGAAGTCAGGCACAGGAGGCGTCCAGTCTCGGAGTCTTGCAAGTGGCCTGTTAGTGCCAT
GACATCGCCGAGCATTGCTAACGTCTTGTAACCATCAGTGATCCACAACCTGATGCAGTTAGTAAAGTCACAAGCAGAAGG
CGTGACGATACAGTGTTGCCACGCGTGTCCACGGCCATGCGGCCAAGTTCCTCCCTGGAGACGATGCTGACCTCGACT
TCTAGGTGCAAATACAAGGACGGCAATGCCATTCCCACAAGGAGATTGCTCATATGATGATTGCGCTGCTCATGGCCGG
CCAGCACTCTTCATCTGCGACCGAGTCTGGATCACTCTCCGCTCGCATCCCGCCCCGACATCCAAGACGAACTCCTCCAA
GAACAAAAGGATATGCTCGGTGTGAACGCCGACGGCAGTATCAAGGAGCTCACATACGCAACCTCTCGAACTCACCT
CCTCAATCAAGTCGTCAAAGAAACCTTCGTATTACGCTCCAGTCCACTCCATTCTGCGCAAGGTCAAGTCTCCCATGCCC
ATCGAAGGTACGGCATACTGTCATTCCAACCAACCCACACTCTTCTGGCCGCTCCGGGCACAACGAGCCGCATGGACGAGCA
CTTTCGCACTGCCTCATTGGGAGCCGCATCGATGGGACGAGAGCCCGTCCGAGAAATACAAGCACCTGTCCCCGACGA
CTGCCCTAGGAAGCATCGCCGAGGAGAAAGAAGACTATGGCCACGGCCTGGTAAGCAAGGGCGCGGCGTCCGCATACTT
ACCTTTGGTGCGGGACGACACAGATGTATCGGCGAGCAATTCGCGTACGTGCAATTGCAGACCATTACAGCGACGATGG

TTCGCGATTTCAAGTTTTACAATGTGGATGGCAGCGACAACGTGGTGGGTACGGATTACAGCAGTTTGTTAGCCGGCCG
CTGTCGCCGGCAGTAGTAAAGTGGGAGAGGAGGGAGGAGAA

>17TEA3 rep1 (juste amorce 1 car amorce 2 et amorce 3 pas séquencées, dans ugene pas mal de différences dans nucléotides pourtant tout est nickel dans sequencher !)

TCACAATGGGTCTCCTCCAGGAAGTCCTCGCGCAATTCGACGCGCAATTCGGCCAGACCAGCCTCTGGAACTTGTCGGAC
TTGGATTCTCGCCTTCAGCACGCTCGCCATCCTCCTCAATGTCCTCTCACAACCTCTCTTCCGTGGCAAGTCGTCCGATCCG
CCACTCGTGTTCCACTGGGTGCCCTTCATCGGAAGCACCATCACCTACGGCATCGACCCATACAAGTTCTTCTTCTCCTGTC
GGGAAAAGTATGGAGATGTCTTTACATTCATCCTGCTGGGAAAAGAAGACGACGGTGTGCTTGGGCACCAAGGGCAATGA
TTTTATTTGAATGGAAACTGAAGGACGTCAACGCGGAGGAGATATACAGCCCTCTGACCACTCCTGTCTTTGGCAAGGA
TGTGTGTTATGATTGTCCCAATTCGAAGCTCATGGAGCAGAAGAAGGTACGGAGAATTGAGAACATACGGGCAAGAGTG
CAGCATATTGACTTGCTCACTTAGTTCGTCAAGTACGGCCTCACAACTCCGCCCTCCAGTCCTACGTGACCTTGATCGCCGC
CGAGACCCGCCAGTTTTTCGACCGTAATAATCCACACAAGAAGTTCGCATCGACGAACGGTACCATCGATCTCCACCAGC
CTCGCCGAACCTTACGATCTATACTGCCAGCCGATCATTGCAAGGAAAGGAAGTCCGCGAGGGCTTCGACTCGTCTTTCGC
GGACCTCTACCACTACCTCGATATGGGATTCACACCGATCAACTTTATGCTTCCGTGGGCGCCCCTTCACAGAACCGACGC
CGCG