

Cumulative Weed Emergence

SS

3/9/2020

```
#NLR model Janesville 2018 - giant ragweed emergence
model = drm(AMBTR ~ DOY, Trt, fct = 14(), data=data1)
summary(model)

##
## Model fitted: Log-logistic (ED50 as parameter) (4 parms)
##
## Parameter estimates:
##
##      Estimate Std. Error t-value  p-value
## b:NTC -19.290249    7.036661 -2.7414 0.1112871
## b:PRE -18.475289    5.649877 -3.2700 0.0821578 .
## c:NTC  -0.671510    0.742241 -0.9047 0.4611115
## c:PRE  -0.490950    0.406983 -1.2063 0.3510302
## d:NTC   1.006541    0.041083 24.5005 0.0016618 **
## d:PRE   1.015970    0.046265 21.9597 0.0020673 **
## e:NTC  147.883690    6.977631 21.1940 0.0022189 **
## e:PRE  150.576937    4.517573 33.3314 0.0008989 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
##  0.02020191 (2 degrees of freedom)

mselect(model, list(14(), W2.3(), W1.3(), W1.4(), W2.4()), sorted=c("IC",
"Res var", "Lack of fit", "no"), icfct = AIC)

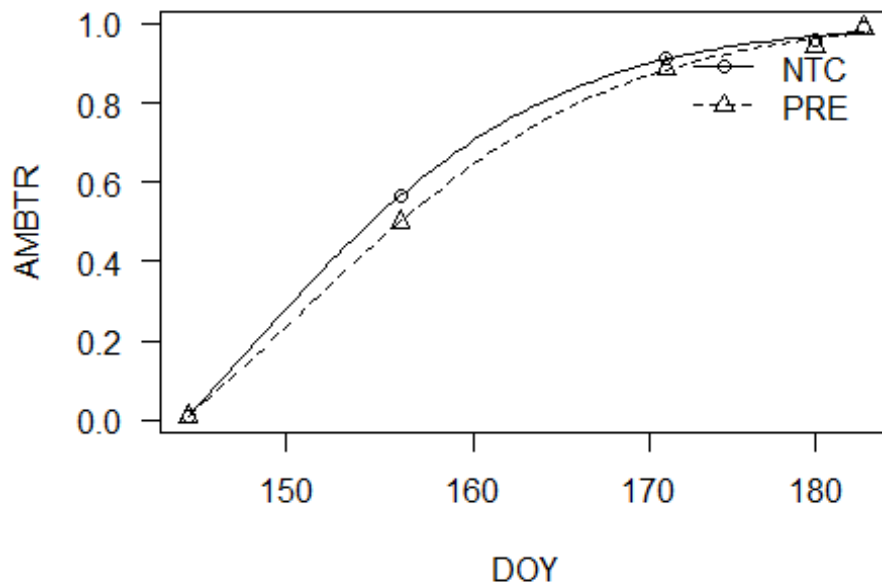
##      logLik      IC Lack of fit      Res var
## 14    32.87758 -47.75517      NA 0.0004081173
## 14    32.87758 -47.75517      NA 0.0004081173
## W1.4 32.63351 -47.26703      NA 0.0004285335
## W1.3 27.93987 -41.87973      NA 0.0005478223
## W2.3 21.39903 -28.79807      NA 0.0020266052
## W2.4 21.39861 -24.79723      NA 0.0040535513

model2 = drm(AMBTR ~ DOY, Trt, fct = 14(fixed=c(NA, NA, NA, NA), names =
c("b", "c", "d", "e")), data=data1)
summary(model2)

##
## Model fitted: Log-logistic (ED50 as parameter) (4 parms)
##
```

```
## Parameter estimates:
##
##      Estimate Std. Error t-value  p-value
## b:NTC -19.290249   7.036661 -2.7414 0.1112871
## b:PRE -18.475289   5.649877 -3.2700 0.0821578 .
## c:NTC  -0.671510   0.742241 -0.9047 0.4611115
## c:PRE  -0.490950   0.406983 -1.2063 0.3510302
## d:NTC   1.006541   0.041083 24.5005 0.0016618 **
## d:PRE   1.015970   0.046265 21.9597 0.0020673 **
## e:NTC 147.883690   6.977631 21.1940 0.0022189 **
## e:PRE 150.576937   4.517573 33.3314 0.0008989 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.02020191 (2 degrees of freedom)

plot(model2)
```



```
ED(model2, c(0.5,0.9), type="absolute", interval = "delta")
##
## Estimated effective doses
##
##      Estimate Std. Error  Lower  Upper
## e:NTC:0.5 154.4531     4.9054 133.3467 175.5596
```

```

## e:NTC:0.9 170.0241      1.7103 162.6652 177.3830
## e:PRE:0.5 155.9909      3.0964 142.6682 169.3137
## e:PRE:0.9 172.2499      2.5569 161.2483 183.2514

EDcomp(model2, c(0.5,0.5), type="absolute")

##
## Estimated ratios of effect doses
##
##              Estimate Std. Error  t-value  p-value
## NTC/PRE:0.5/0.5  0.990142    0.037084 -0.265837  0.815260

EDcomp(model2, c(0.9,0.9), type="absolute")

##
## Estimated ratios of effect doses
##
##              Estimate Std. Error  t-value  p-value
## NTC/PRE:0.9/0.9  0.98708     0.01770 -0.73005  0.54129

#NLR model - Janesville 2019 giant ragweed emergence
model3 = drm(AMBTR ~ DOY, Trt, fct = 14(), data=data2)
summary(model3)

##
## Model fitted: Log-logistic (ED50 as parameter) (4 parms)
##
## Parameter estimates:
##
##              Estimate Std. Error t-value  p-value
## b:NTC -15.993545     4.857884 -3.2923 0.0109845 *
## b:PRE -18.404207     5.160372 -3.5664 0.0073315 **
## c:NTC  0.199059     0.047771  4.1670 0.0031350 **
## c:PRE  0.223602     0.040130  5.5720 0.0005272 ***
## d:NTC  1.147502     0.155358  7.3862 7.721e-05 ***
## d:PRE  1.158867     0.143535  8.0738 4.087e-05 ***
## e:NTC 164.402112     3.731235 44.0610 7.769e-11 ***
## e:PRE 166.656438     3.218147 51.7865 2.142e-11 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.04161458 (8 degrees of freedom)

mselect(model3, list(14(), W2.3(), W1.3(), W1.4(), W2.4()), sorted=c("IC",
"Res var", "Lack of fit", "no"), icfct = AIC)

##              logLik      IC Lack of fit      Res var
## W2.4 35.84423 -53.68846      NA 0.001326437
## 14   33.71104 -49.42207      NA 0.001731773
## 14   33.71104 -49.42207      NA 0.001731773

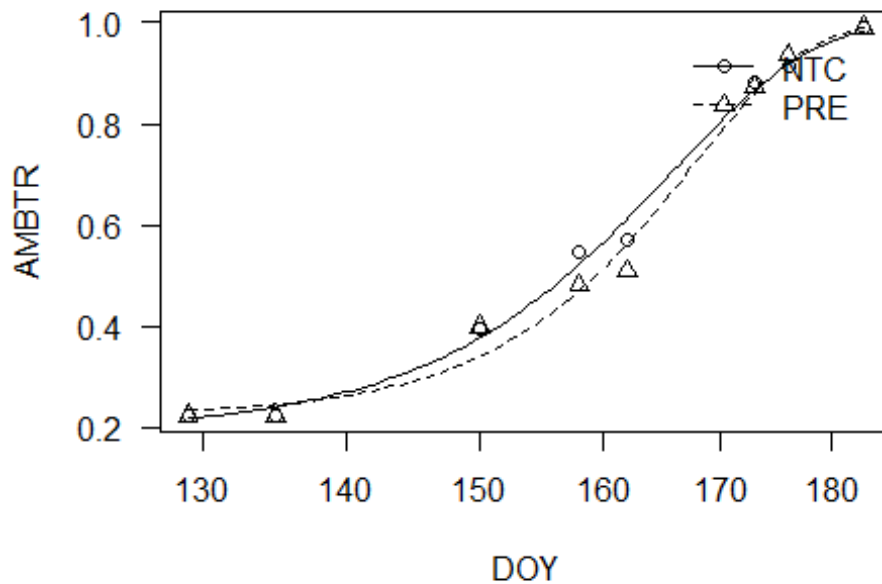
```

```
## W1.4 31.60129 -45.20257      NA 0.002254356
## W2.3 27.57019 -41.14039      NA 0.002985023
## W1.3 25.89972 -37.79944      NA 0.003678175

model4 = drm(AMBTR ~ DOY, Trt, fct = W2.4(fixed=c(NA, NA, 1, NA), names =
c("b", "c", "d", "e")), data=data2)
summary(model4)

##
## Model fitted: Weibull (type 2) (3 parms)
##
## Parameter estimates:
##
##      Estimate Std. Error  t-value  p-value
## b:NTC   13.549612    1.667122   8.1275 1.025e-05 ***
## b:PRE   16.511898    2.045424   8.0726 1.088e-05 ***
## c:NTC    0.191288    0.034767   5.5021 0.000261 ***
## c:PRE    0.223532    0.029150   7.6683 1.703e-05 ***
## e:NTC  165.649634    1.050716 157.6540 < 2.2e-16 ***
## e:PRE  167.447495    0.908471 184.3179 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.03320156 (10 degrees of freedom)

plot(model4)
```



```
ED(model4, c(0.5,0.9), type="absolute", interval = "delta")
```

```
##
```

```
## Estimated effective doses
```

```
##
```

	Estimate	Std. Error	Lower	Upper
## e:NTC:0.5	156.9354	1.7072	153.1314	160.7394
## e:NTC:0.9	174.9131	1.2482	172.1320	177.6942
## e:PRE:0.5	159.3287	1.4979	155.9913	162.6662
## e:PRE:0.9	174.8855	1.1063	172.4204	177.3506

```
EDcomp(model4, c(0.5,0.5), type="absolute")
```

```
##
```

```
## Estimated ratios of effect doses
```

```
##
```

	Estimate	Std. Error	t-value	p-value
## NTC/PRE:0.5/0.5	0.984979	0.014162	-1.060685	0.313779

```
EDcomp(model4, c(0.9,0.9), type="absolute")
```

```
##
```

```
## Estimated ratios of effect doses
```

```
##
```

	Estimate	Std. Error	t-value	p-value
## NTC/PRE:0.9/0.9	1.0001577	0.0095378	0.0165330	0.9871344

```
#NLR model - Brooklyn 2019 waterhemp emergence
```

```
model5 = drm(AMATU ~ DOY, Trt, fct = l4(), data=data3)
```

```
summary(model5)
```

```
##
```

```
## Model fitted: Log-logistic (ED50 as parameter) (4 parms)
```

```
##
```

```
## Parameter estimates:
```

```
##
```

	Estimate	Std. Error	t-value	p-value	
## b:NTC	-19.316531	6.353347	-3.0404	0.0383883	*
## b:PRE	-38.150586	16.241311	-2.3490	0.0786025	.
## c:NTC	-0.022774	0.071132	-0.3202	0.7648734	
## c:PRE	-0.023459	0.068656	-0.3417	0.7497775	
## d:NTC	1.131978	0.227961	4.9657	0.0076751	**
## d:PRE	0.938682	0.080970	11.5930	0.0003163	***
## e:NTC	172.707019	4.690707	36.8190	3.249e-06	***
## e:PRE	163.902521	1.807965	90.6558	8.876e-08	***

```
## ---
```

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

```
##
```

```
## Residual standard error:
```

```
##
```

```
## 0.07873407 (4 degrees of freedom)
```

```
mselect(model5, list(l4(), W2.3(), W1.3(), W1.4(), W2.4()), sorted=c("IC",  
"Res var", "Lack of fit", "no"), icfct = AIC)
```

	logLik	IC	Lack of fit	Res var
## W1.3	24.19331	-34.38662	NA	0.002076756
## W1.4	24.31815	-30.63631	NA	0.003050986
## l4	20.06456	-22.12913	NA	0.006199054
## l4	20.06456	-22.12913	NA	0.006199054
## W2.3	17.75750	-21.51501	NA	0.006070502
## W2.4	17.91197	-17.82394	NA	0.008874323

```
model6 = drm(AMATU ~ DOY, Trt, fct = W1.3(fixed=c(NA, 1, NA), names = c("b",  
"c", "d")), data=data3)
```

```
summary(model6)
```

```
##
```

```
## Model fitted: Weibull (type 1) with lower limit at 0 (2 parms)
```

```
##
```

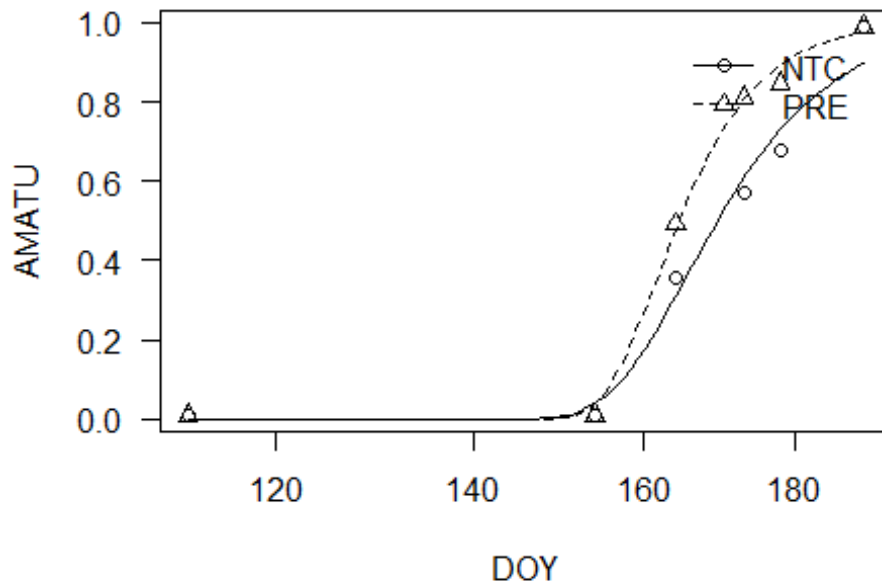
```
## Parameter estimates:
```

```
##
```

	Estimate	Std. Error	t-value	p-value	
## b:NTC	-16.07886	1.85275	-8.6784	2.420e-05	***
## b:PRE	-23.09099	3.18004	-7.2612	8.710e-05	***
## d:NTC	165.68115	1.02775	161.2072	2.448e-15	***
## d:PRE	161.95390	0.88565	182.8647	8.916e-16	***

```
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.05046729 (8 degrees of freedom)
plot(model6)
```



```
ED(model6, c(0.5,0.9), type="absolute", interval = "delta")

##
## Estimated effective doses
##
##           Estimate Std. Error   Lower   Upper
## e:NTC:0.5 169.50118    0.96947 167.26559 171.73677
## e:NTC:0.9 190.57071    2.83176 184.04067 197.10075
## e:PRE:0.5 164.54503    0.82122 162.65128 166.43877
## e:PRE:0.9 178.53206    2.18677 173.48937 183.57476

EDcomp(model6, c(0.5,0.5), type="absolute")

##
## Estimated ratios of effect doses
##
##           Estimate Std. Error  t-value  p-value
## NTC/PRE:0.5/0.5 1.0301203   0.0078195 3.8519301 0.0048642

EDcomp(model6, c(0.9,0.9), type="absolute")
```

```
##
## Estimated ratios of effect doses
##
##           Estimate Std. Error  t-value  p-value
## NTC/PRE:0.9/0.9 1.067431    0.020555 3.280463 0.011180

#NLR model - Arlington 2018 common ragweed emergence
model7 = drm(AMBEL ~ DOY, fct = 14(), data=data4)
summary(model7)

##
## Model fitted: Log-logistic (ED50 as parameter) (4 parms)
##
## Parameter estimates:
##
##           Estimate Std. Error  t-value  p-value
## b:(Intercept) -6.7563e+01  3.0634e+00  -22.0550 5.679e-07 ***
## c:(Intercept)  4.2633e-03  1.7243e-03   2.4725  0.0483 *
## d:(Intercept)  9.9074e-01  4.6577e-04 2127.0837 < 2.2e-16 ***
## e:(Intercept)  1.5535e+02  7.9104e-02 1963.8227 < 2.2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.001032567 (6 degrees of freedom)

mselect(model7, list(14(), W2.3(), W1.3(), W1.4(), W2.4()), sorted=c("IC",
"Res var", "Lack of fit", "no"), icfct = AIC)

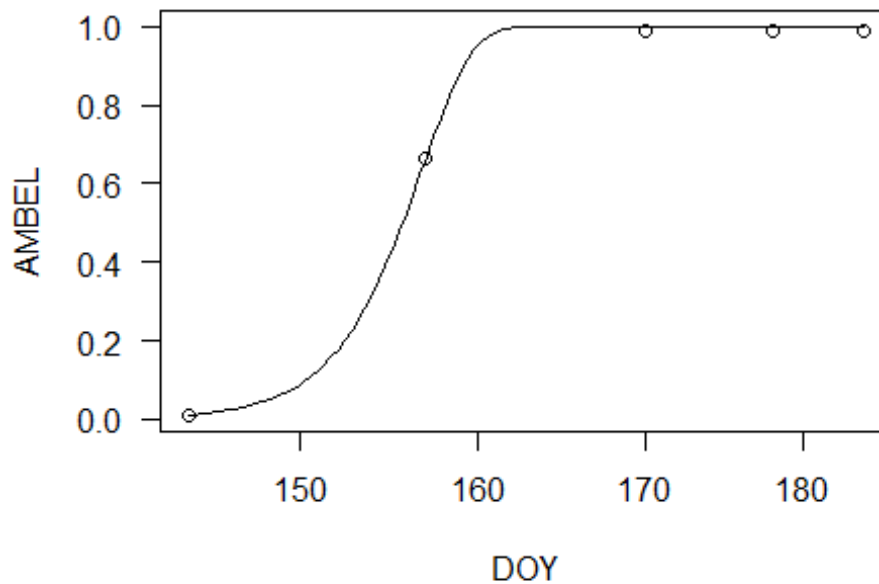
##           logLik           IC Lack of fit           Res var
## W2.3 89.04501 -170.09001 4.687315e-58 1.541973e-09
## W2.4 84.12944 -158.25888 1.362702e-59 4.808219e-09
## 14 57.12182 -104.24364 1.861104e-65 1.066194e-06
## 14 57.12182 -104.24364 1.861104e-65 1.066194e-06
## W1.4 50.01406 -90.02812 5.325258e-67 4.417823e-06
## W1.3 39.19857 -70.39714 7.029229e-69 3.293694e-05

model8 = drm(AMBEL ~ DOY, fct = W2.3(fixed=c(NA, 1, NA), names = c("b", "c",
"d")), data=data4)
summary(model8)

##
## Model fitted: Weibull (type 2) with lower limit at 0 (2 parms)
##
## Parameter estimates:
##
##           Estimate Std. Error  t-value  p-value
## b:(Intercept) 54.106561  6.935279   7.8016 5.229e-05 ***
## d:(Intercept) 156.727821  0.058915 2660.2564 < 2.2e-16 ***
## ---
```



```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.008660698 (8 degrees of freedom)
plot(model8)
```



```
ED(model8, c(0.5,0.9), type="absolute", interval = "delta")

##
## Estimated effective doses
##
##           Estimate Std. Error   Lower   Upper
## e:1:0.5 155.66975    0.17516 155.26582 156.07367
## e:1:0.9 159.16244    0.28477 158.50576 159.81911

#NLR model - Arlington 2019 common ragweed emergence
model9 = drm(AMBEL ~ DOY, Trt, fct = 14(), data=data5)
summary(model9)

##
## Model fitted: Log-logistic (ED50 as parameter) (4 parms)
##
## Parameter estimates:
##
##           Estimate Std. Error t-value p-value
## b:NTC -6.5591e+01  9.8290e+00 -6.6732 0.000157 ***
```

```
## b:PRE -1.3773e+02 2.5906e+02 -0.5316 0.609410
## c:NTC 1.0481e-01 9.0983e-03 11.5199 2.925e-06 ***
## c:PRE 1.0499e-01 1.0929e-02 9.6066 1.144e-05 ***
## d:NTC 9.7997e-01 6.5669e-03 149.2275 4.495e-15 ***
## d:PRE 9.9007e-01 5.4800e-03 180.6689 9.370e-16 ***
## e:NTC 1.4762e+02 1.5720e-01 939.0402 < 2.2e-16 ***
## e:PRE 1.4013e+02 1.3863e+01 10.1084 7.831e-06 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.012814 (8 degrees of freedom)

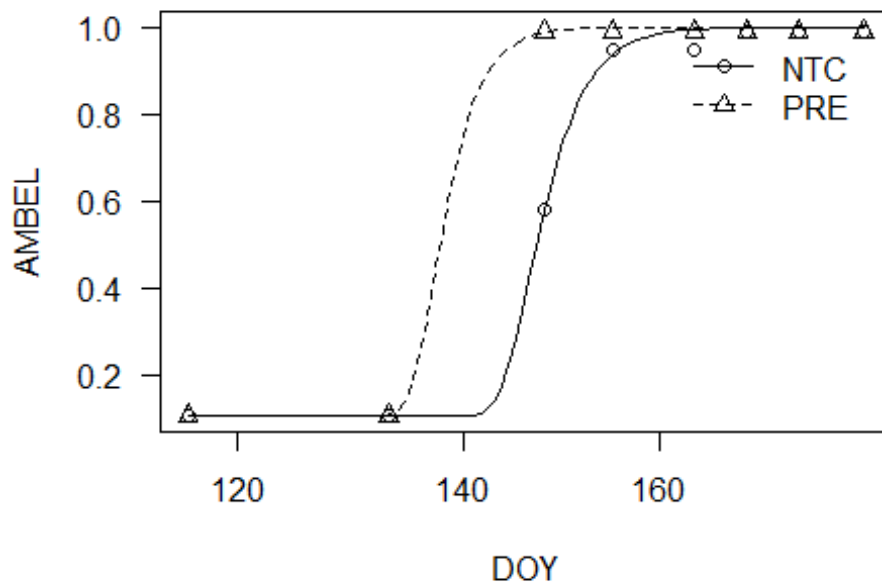
mselect(model9, list(l4(), W2.3(), W1.3(), W1.4(), W2.4()), sorted=c("IC",
"Res var", "Lack of fit", "no"), icfct = AIC)

##          logLik          IC Lack of fit      Res var
## W1.4 52.67501 -87.35003          NA 0.0001618070
## l4 52.55764 -87.11527          NA 0.0001641985
## l4 52.55764 -87.11527          NA 0.0001641985
## W2.4 50.80963 -83.61926          NA 0.0002042975
## W2.3 29.07087 -44.14175          NA 0.0024744608
## W1.3 26.39999 -38.79997          NA 0.0034552110

model10 = drm(AMBEL ~ DOY, Trt, fct = W1.4(fixed=c(NA, NA, 1, NA), names =
c("b", "c", "d", "e")), data=data5)
summary(model10)

##
## Model fitted: Weibull (type 1) (3 parms)
##
## Parameter estimates:
##
##          Estimate Std. Error t-value p-value
## b:NTC -47.469847 7.292808 -6.5091 6.816e-05 ***
## b:PRE -58.292282 24.208073 -2.4080 0.03681 *
## c:NTC 0.105174 0.012597 8.3493 8.083e-06 ***
## c:PRE 0.104523 0.015579 6.7095 5.302e-05 ***
## e:NTC 146.585344 0.318086 460.8358 < 2.2e-16 ***
## e:PRE 137.311931 3.363746 40.8211 1.863e-12 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.01781497 (10 degrees of freedom)

plot(model10)
```



```
ED(model10, c(0.5,0.9), type="absolute", interval = "delta")
```

```
##
## Estimated effective doses
##
##           Estimate Std. Error   Lower   Upper
## e:NTC:0.5 147.20631    0.24912 146.65123 147.76140
## e:NTC:0.9 153.32153    0.81512 151.50533 155.13773
## e:PRE:0.5 137.78809    3.27332 130.49468 145.08151
## e:PRE:0.9 142.43081    2.95796 135.84006 149.02155
```

```
EDcomp(model10, c(0.5,0.5), type="absolute")
```

```
##
## Estimated ratios of effect doses
##
##           Estimate Std. Error t-value p-value
## NTC/PRE:0.5/0.5 1.068353    0.025444 2.686372 0.022842
```

```
EDcomp(model10, c(0.9,0.9), type="absolute")
```

```
##
## Estimated ratios of effect doses
##
##           Estimate Std. Error t-value p-value
## NTC/PRE:0.9/0.9 1.0764632    0.0230766 3.3134587 0.0078335
```

```

#NLR model - Lancaster 2018 common LQ emergence
model11 = drm(CHEAL ~ DOY, Trt, fct = 14(), data=data6)
summary(model11)

##
## Model fitted: Log-logistic (ED50 as parameter) (4 parms)
##
## Parameter estimates:
##
##           Estimate Std. Error t-value  p-value
## b:NTC -1.7936e+01  2.8997e+00 -6.1855 0.0251543 *
## b:PRE -3.5270e+02  6.5081e+03 -0.0542 0.9617074
## c:NTC -6.3584e-01  3.0544e-01 -2.0817 0.1728223
## c:PRE  8.3206e-03  2.3870e-02  0.3486 0.7606779
## d:NTC  1.0140e+00  2.7138e-02 37.3634 0.0007156 ***
## d:PRE  9.9000e-01  1.0856e-02 91.1909 0.0001202 ***
## e:NTC  1.4747e+02  3.1256e+00 47.1815 0.0004489 ***
## e:PRE  1.5785e+02  4.3958e+01  3.5909 0.0695570 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.01880371 (2 degrees of freedom)

mselect(model11, list(14(), W2.3(), W1.3(), W1.4(), W2.4()), sorted=c("IC",
"Res var", "Lack of fit", "no"), icfct = AIC)

## Warning in sqrt(diag(varMat)): NaNs produced

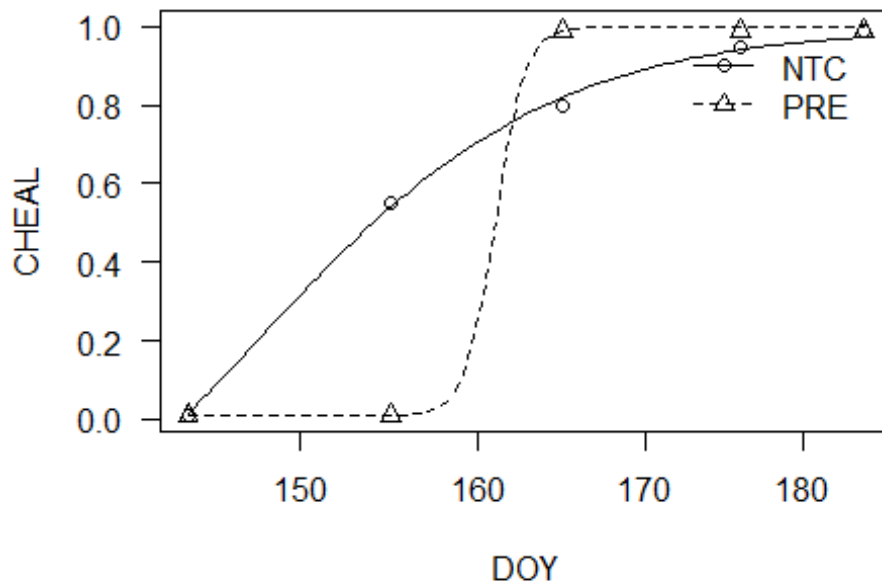
##           logLik          IC Lack of fit          Res var
## 14      33.59482 -49.18963              NA 0.0003535795
## 14      33.59482 -49.18963              NA 0.0003535795
## W1.4    29.34242 -40.68485              NA 0.0008276471
## W1.3    25.32555 -36.65109              NA 0.0009240952
## W2.3    16.83994 -19.67987              NA 0.0050439109
## W2.4    16.86654 -15.73308              NA 0.0100342922

model12 = drm(CHEAL ~ DOY, Trt, fct = 14(fixed=c(NA, NA, 1, NA), names =
c("b", "c", "d", "e")), data=data6)
summary(model12)

##
## Model fitted: Log-logistic (ED50 as parameter) (3 parms)
##
## Parameter estimates:
##
##           Estimate Std. Error t-value  p-value
## b:NTC -1.8478e+01  1.6822e+00 -10.9844 0.0003903 ***
## b:PRE -1.8651e+02  3.0073e+02 -0.6202 0.5687113
## c:NTC -6.3550e-01  2.2816e-01 -2.7853 0.0495506 *

```

```
## c:PRE 9.3992e-03 1.3959e-02 0.6734 0.5376261
## e:NTC 1.4732e+02 2.4329e+00 60.5557 4.454e-07 ***
## e:PRE 1.6100e+02 6.2453e+00 25.7787 1.345e-05 ***
## ---
## Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.01642074 (4 degrees of freedom)
plot(model12)
```



```
ED(model12, c(0.5,0.9), type="absolute", interval = "delta")

##
## Estimated effective doses
##
##      Estimate Std. Error   Lower   Upper
## e:NTC:0.5 154.0106     1.9694 148.5427 159.4786
## e:NTC:0.9 170.7930     1.0222 167.9549 173.6312
## e:PRE:0.5 160.9788     6.2704 143.5694 178.3882
## e:PRE:0.9 162.8938     3.3862 153.4923 172.2954

EDcomp(model12, c(0.5,0.5), type="absolute")

##
## Estimated ratios of effect doses
##
```

```

##              Estimate Std. Error  t-value  p-value
## NTC/PRE:0.5/0.5  0.956714    0.039222 -1.103606  0.331689

EDcomp(model12, c(0.9,0.9), type="absolute")

##
## Estimated ratios of effect doses
##
##              Estimate Std. Error  t-value  p-value
## NTC/PRE:0.9/0.9  1.048493    0.022681  2.138032  0.099307

#NLR model - Lancaster 2019 common LQ emergence
model13 = drm(CHEAL ~ DOY, fct = 14(), data=data7)
summary(model13)

##
## Model fitted: Log-logistic (ED50 as parameter) (4 parms)
##
## Parameter estimates:
##
##              Estimate Std. Error  t-value  p-value
## b:(Intercept) -31.1798704    3.3225145   -9.3844  0.0111651 *
## c:(Intercept)   0.0077613    0.0179327    0.4328  0.7073588
## d:(Intercept)   1.0212029    0.0221653   46.0722  0.0004708 ***
## e:(Intercept) 166.0388978    0.6275858  264.5676  1.429e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
##  0.02329576 (2 degrees of freedom)

mselect(model13, list(14(), W2.3(), W1.3(), W1.4(), W2.4()), sorted=c("IC",
"Res var", "Lack of fit", "no"), icfct = AIC)

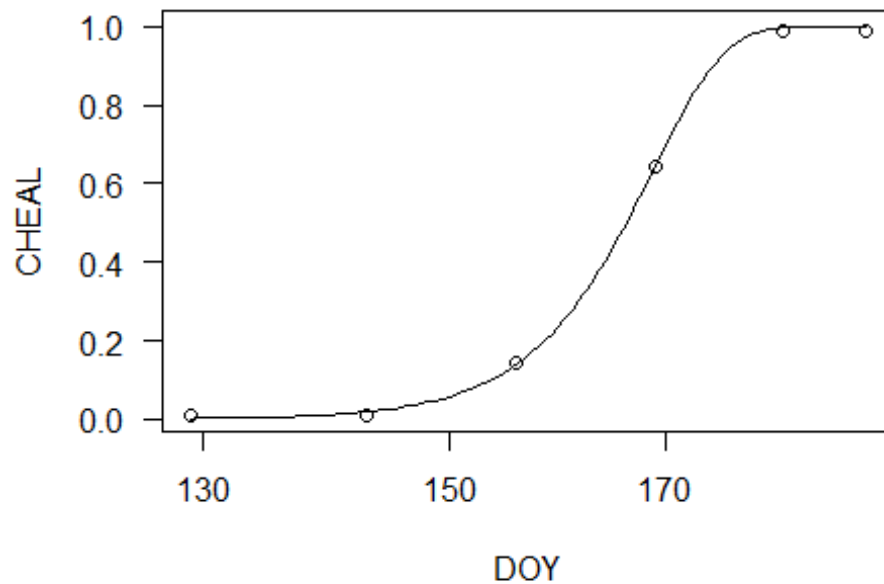
##      logLik      IC Lack of fit      Res var
## W2.3 23.24639 -38.49278      NA 5.050057e-05
## W2.4 23.23651 -36.47302      NA 7.600073e-05
## 14   17.33911 -24.67822      NA 5.426923e-04
## 14   17.33911 -24.67822      NA 5.426923e-04
## W1.3 13.97931 -19.95862      NA 1.108774e-03
## W1.4 14.25161 -18.50321      NA 1.518852e-03

model14 = drm(CHEAL ~ DOY, fct = W2.3(fixed=c(NA, 1, NA), names = c("b", "c",
"d")), data=data7)
summary(model14)

##
## Model fitted: Weibull (type 2) with lower limit at 0 (2 parms)
##
## Parameter estimates:
##

```

```
##               Estimate Std. Error  t-value   p-value
## b:(Intercept)  23.86483    0.85410   27.942 9.760e-06 ***
## d:(Intercept) 168.79695    0.16741 1008.279 5.805e-12 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error:
##
## 0.008799998 (4 degrees of freedom)
plot(model14)
```



```
ED(model14, c(0.5,0.9), type="absolute", interval = "delta")
##
## Estimated effective doses
##
##               Estimate Std. Error   Lower   Upper
## e:1:0.5 166.22439    0.16240 165.77349 166.67530
## e:1:0.9 174.80039    0.31762 173.91852 175.68226
```