**First four-day exp-diet**

**data** b;

input treatment$ position$ rep diet;

cards;

Control B 1 1.1

Control B 1 0.9

Control B 1 1.8

Control B 1 0.9

Control M 1 0.3

Control M 1 1.9

Control M 1 2.6

Control T 1 2.6

Control T 1 1

Control B 2 0.4

Control B 2 3.6

Control B 2 1.5

Control B 2 1

Control M 2 1.4

Control M 2 1.2

Control M 2 4.2

Control T 2 0.5

Control T 2 4.1

Control T 2 2.9

Control T 2 3.9

Control B 3 0.7

Control B 3 0.6

Control B 3 0.1

Control B 3 1.4

Control M 3 3.2

Control M 3 4.2

Control M 3 2.5

Control T 3 9.5

Control T 3 6.9

Control B 4 0.8

Control B 4 1.3

Control B 4 2.3

Control B 4 2.2

Control M 4 1.3

Control M 4 3.1

Control M 4 1.6

Control M 4 2

Control T 4 6.4

Control T 4 3.8

Control T 4 3.1

Control T 4 2.1

Control B 5 1.4

Control B 5 2.1

Control B 5 1

Control B 5 1.4

Control M 5 1.7

Control M 5 2.8

Control M 5 3.1

Control T 5 2.5

Control T 5 1.5

Control T 5 2

Control B 6 3.9

Control B 6 0.1

Control M 6 3

Control M 6 1.7

Control M 6 2.8

Control M 6 1.6

Control T 6 0.2

Control T 6 5.9

Control T 6 1.7

Control B 7 1.1

Control B 7 2.1

Control B 7 0.5

Control M 7 0.7

Control M 7 1.9

Control M 7 1.5

Control M 7 0.6

Control T 7 1.7

Control T 7 2

Control B 8 0.8

Control B 8 2.6

Control B 8 1.9

Control B 8 1.7

Control M 8 2.5

Control M 8 1.4

Control M 8 1.4

Control M 8 2.7

Control T 8 1.9

Control T 8 1.3

Control T 8 2.6

Dicamba B 1 1

Dicamba B 1 1

Dicamba B 1 0.9

Dicamba M 1 2.2

Dicamba M 1 0.9

Dicamba M 1 1

Dicamba T 1 2.2

Dicamba T 1 1.4

Dicamba T 1 4

Dicamba B 2 1.4

Dicamba B 2 0.8

Dicamba B 2 1.1

Dicamba M 2 1

Dicamba M 2 1.1

Dicamba M 2 1.6

Dicamba M 2 0.9

Dicamba T 2 3.7

Dicamba T 2 3.1

Dicamba T 2 0.7

Dicamba B 3 0.9

Dicamba B 3 1.8

Dicamba B 3 1.1

Dicamba M 3 1.6

Dicamba M 3 3.2

Dicamba M 3 2.1

Dicamba T 3 1.9

Dicamba B 4 1.3

Dicamba B 4 1.5

Dicamba B 4 0.5

Dicamba B 4 0.2

Dicamba M 4 0.1

Dicamba M 4 1.7

Dicamba M 4 2

Dicamba T 4 4.5

Dicamba T 4 5.1

Dicamba T 4 4.5

Dicamba B 5 1

Dicamba B 5 0.9

Dicamba B 5 1.5

Dicamba T 5 1.9

Dicamba T 5 3.7

Dicamba T 5 3.5

Dicamba T 5 1.8

Dicamba B 6 1.6

Dicamba B 6 0.1

Dicamba B 6 2

Dicamba B 6 1.1

Dicamba M 6 9.4

Dicamba M 6 3

Dicamba M 6 1.6

Dicamba M 6 2.2

Dicamba T 6 2

Dicamba T 6 1.2

Dicamba T 6 4.2

Dicamba B 7 1.4

Dicamba B 7 0.5

Dicamba B 7 1.6

Dicamba B 7 0.2

Dicamba M 7 1.7

Dicamba M 7 2.4

Dicamba M 7 0.5

Dicamba M 7 2.1

Dicamba B 8 0.1

Dicamba M 8 2.2

Dicamba M 8 9.9

Dicamba M 8 1.8

Dicamba M 8 1.6

Dicamba T 8 1.7

Dicamba T 8 2.8

;

**proc** **mixed** data=b;

title "F 4-day exp- diet ";

class treatment position rep;

model diet= treatment position rep treatment\*position;

lsmeans treatment / pdiff;

lsmeans position / pdiff;

**run**;**quit**;

**Second four-day exp-diet**

**data** c;

input treatment$ rep position$ diet ;

cards;

;

Dicamba 1 T 5.9

Dicamba 1 M 5.8

Dicamba 1 B 1.1

Dicamba 2 T 6.2

Dicamba 2 M 5.1

Dicamba 3 T 4.2

Dicamba 3 M 3.9

Dicamba 3 B 2.4

Dicamba 4 T 6.2

Dicamba 4 M 3.8

Dicamba 4 B 4.4

Dicamba 5 T 7.1

Dicamba 5 M 5.1

Dicamba 5 B 4.2

Dicamba 6 T 8.8

Dicamba 6 M 4.5

Dicamba 7 T 1.8

Dicamba 7 M 4.9

Dicamba 7 B 2.4

Dicamba 8 T 4.4

Dicamba 8 M 4.7

Dicamba 8 B 4.9

Dicamba 9 T 5.9

Dicamba 9 M 4.9

Dicamba 9 B 4.7

Dicamba 10 T 4.8

Dicamba 10 M 5.3

Dicamba 10 B 3.1

Dicamba 11 T 5.8

Dicamba 11 M 3.5

Dicamba 11 B 6.9

Dicamba 12 T 5.2

Dicamba 12 M 4.9

Dicamba 13 T 4.8

Dicamba 13 M 4.1

Dicamba 13 B 4.5

Dicamba 14 T 5.8

Dicamba 14 M 4.5

Dicamba 14 B 4.2

Dicamba 15 T 4.9

Dicamba 15 M 2.8

Dicamba 15 B 3.4

Dicamba 16 T 6.8

Dicamba 16 M 4.7

Dicamba 17 T 7.6

Dicamba 17 M 2.1

Dicamba 17 B 3.3

Dicamba 18 T 6.6

Dicamba 18 M 4.1

Dicamba 18 B 1.9

Dicamba 19 T 6.8

Dicamba 19 M 6

Dicamba 19 B 3.1

Dicamba 20 T 5.9

Dicamba 20 M 4.6

Dicamba 20 B 4.9

Control 1 T 6.9

Control 1 M 7.7

Control 1 B 5.8

Control 2 T 6.3

Control 2 M 5.7

Control 2 B 5.8

Control 3 T 7.9

Control 3 M 3.8

Control 3 B 3.4

Control 4 T 7.4

Control 4 M 4.9

Control 4 B 4

Control 5 M 4.2

Control 5 B 5.1

Control 6 T 5.9

Control 6 M 5.1

Control 6 B 5.1

Control 7 T 6.8

Control 7 M 4.4

Control 7 B 3.1

Control 8 T 6.1

Control 8 M 3.4

Control 8 B 5.2

Control 9 T 7.1

Control 9 M 3.2

Control 9 B 4.1

Control 10 T 4.7

Control 10 M 2.2

Control 10 B 5.1

Control 11 T 6.2

Control 11 M 3.5

Control 11 B 5.1

Control 12 T 6.1

Control 12 M 5.6

Control 12 B 4.6

Control 13 T 6.3

Control 13 M 4.5

Control 13 B 4.2

Control 14 T 5.8

Control 14 M 4.6

Control 14 B 3.4

Control 15 B 4.1

Control 16 T 6.1

Control 16 M 5.4

Control 16 B 3.7

Control 17 T 5.9

Control 17 M 6.2

Control 17 B 4.7

Control 18 T 4.1

Control 18 M 3.5

Control 18 B 3.6

Control 19 T 6.7

Control 19 M 4.1

Control 19 B 5.2

Control 20 T 6.8

Control 20 M 4.1

Control 20 B 5.6

;

**proc** **mixed** data=c;

title "S 4-day exp- diet ";

class treatment position rep;

model diet= treatment position rep treatment\*position;

lsmeans treatment / pdiff;

**run**;**quit**;

**Pool first and second four day exps-diet**

**data** f;

input treatment$ position$ diet run;

cards;

Dicamba T 5.9 2

Dicamba M 5.8 2

Dicamba B 1.1 2

Dicamba T 6.2 2

Dicamba M 5.1 2

Dicamba T 4.2 2

Dicamba M 3.9 2

Dicamba B 2.4 2

Dicamba T 6.2 2

Dicamba M 3.8 2

Dicamba B 4.4 2

Dicamba T 7.1 2

Dicamba M 5.1 2

Dicamba B 4.2 2

Dicamba T 8.8 2

Dicamba M 4.5 2

Dicamba T 1.8 2

Dicamba M 4.9 2

Dicamba B 2.4 2

Dicamba T 4.4 2

Dicamba M 4.7 2

Dicamba B 4.9 2

Dicamba T 5.9 2

Dicamba M 4.9 2

Dicamba B 4.7 2

Dicamba T 4.8 2

Dicamba M 5.3 2

Dicamba B 3.1 2

Dicamba T 5.8 2

Dicamba M 3.5 2

Dicamba B 6.9 2

Dicamba T 5.2 2

Dicamba M 4.9 2

Dicamba T 4.8 2

Dicamba M 4.1 2

Dicamba B 4.5 2

Dicamba T 5.8 2

Dicamba M 4.5 2

Dicamba B 4.2 2

Dicamba T 4.9 2

Dicamba M 2.8 2

Dicamba B 3.4 2

Dicamba T 6.8 2

Dicamba M 4.7 2

Dicamba T 7.6 2

Dicamba M 2.1 2

Dicamba B 3.3 2

Dicamba T 6.6 2

Dicamba M 4.1 2

Dicamba B 1.9 2

Dicamba T 6.8 2

Dicamba M 6 2

Dicamba B 3.1 2

Dicamba T 5.9 2

Dicamba M 4.6 2

Dicamba B 4.9 2

Control T 6.9 2

Control M 7.7 2

Control B 5.8 2

Control T 6.3 2

Control M 5.7 2

Control B 5.8 2

Control T 7.9 2

Control M 3.8 2

Control B 3.4 2

Control T 7.4 2

Control M 4.9 2

Control B 4 2

Control M 4.2 2

Control B 5.1 2

Control T 5.9 2

Control M 5.1 2

Control B 5.1 2

Control T 6.8 2

Control M 4.4 2

Control B 3.1 2

Control T 6.1 2

Control M 3.4 2

Control B 5.2 2

Control T 7.1 2

Control M 3.2 2

Control B 4.1 2

Control T 4.7 2

Control M 2.2 2

Control B 5.1 2

Control T 6.2 2

Control M 3.5 2

Control B 5.1 2

Control T 6.1 2

Control M 5.6 2

Control B 4.6 2

Control T 6.3 2

Control M 4.5 2

Control B 4.2 2

Control T 5.8 2

Control M 4.6 2

Control B 3.4 2

Control B 4.1 2

Control T 6.1 2

Control M 5.4 2

Control B 3.7 2

Control T 5.9 2

Control M 6.2 2

Control B 4.7 2

Control T 4.1 2

Control M 3.5 2

Control B 3.6 2

Control T 6.7 2

Control M 4.1 2

Control B 5.2 2

Control T 6.8 2

Control M 4.1 2

Control B 5.6 2

Control B 1.1 1

Control B 0.9 1

Control B 1.8 1

Control B 0.9 1

Control M 0.3 1

Control M 1.9 1

Control M 2.6 1

Control T 2.6 1

Control T 1 1

Control B 0.4 1

Control B 3.6 1

Control B 1.5 1

Control B 1 1

Control M 1.4 1

Control M 1.2 1

Control M 4.2 1

Control T 0.5 1

Control T 4.1 1

Control T 2.9 1

Control T 3.9 1

Control B 0.7 1

Control B 0.6 1

Control B 0.1 1

Control B 1.4 1

Control M 3.2 1

Control M 4.2 1

Control M 2.5 1

Control T 9.5 1

Control T 6.9 1

Control B 0.8 1

Control B 1.3 1

Control B 2.3 1

Control B 2.2 1

Control M 1.3 1

Control M 3.1 1

Control M 1.6 1

Control M 2 1

Control T 6.4 1

Control T 3.8 1

Control T 3.1 1

Control T 2.1 1

Control B 1.4 1

Control B 2.1 1

Control B 1 1

Control B 1.4 1

Control M 1.7 1

Control M 2.8 1

Control M 3.1 1

Control T 2.5 1

Control T 1.5 1

Control T 2 1

Control B 3.9 1

Control B 0.1 1

Control M 3 1

Control M 1.7 1

Control M 2.8 1

Control M 1.6 1

Control T 0.2 1

Control T 5.9 1

Control T 1.7 1

Control B 1.1 1

Control B 2.1 1

Control B 0.5 1

Control M 0.7 1

Control M 1.9 1

Control M 1.5 1

Control M 0.6 1

Control T 1.7 1

Control T 2 1

Control B 0.8 1

Control B 2.6 1

Control B 1.9 1

Control B 1.7 1

Control M 2.5 1

Control M 1.4 1

Control M 1.4 1

Control M 2.7 1

Control T 1.9 1

Control T 1.3 1

Control T 2.6 1

Dicamba B 1 1

Dicamba B 1 1

Dicamba B 0.9 1

Dicamba M 2.2 1

Dicamba M 0.9 1

Dicamba M 1 1

Dicamba T 2.2 1

Dicamba T 1.4 1

Dicamba T 4 1

Dicamba B 1.4 1

Dicamba B 0.8 1

Dicamba B 1.1 1

Dicamba M 1 1

Dicamba M 1.1 1

Dicamba M 1.6 1

Dicamba M 0.9 1

Dicamba T 3.7 1

Dicamba T 3.1 1

Dicamba T 0.7 1

Dicamba B 0.9 1

Dicamba B 1.8 1

Dicamba B 1.1 1

Dicamba M 1.6 1

Dicamba M 3.2 1

Dicamba M 2.1 1

Dicamba T 1.9 1

Dicamba B 1.3 1

Dicamba B 1.5 1

Dicamba B 0.5 1

Dicamba B 0.2 1

Dicamba M 0.1 1

Dicamba M 1.7 1

Dicamba M 2 1

Dicamba T 4.5 1

Dicamba T 5.1 1

Dicamba T 4.5 1

Dicamba B 1 1

Dicamba B 0.9 1

Dicamba B 1.5 1

Dicamba T 1.9 1

Dicamba T 3.7 1

Dicamba T 3.5 1

Dicamba T 1.8 1

Dicamba B 1.6 1

Dicamba B 0.1 1

Dicamba B 2 1

Dicamba B 1.1 1

Dicamba M 9.4 1

Dicamba M 3 1

Dicamba M 1.6 1

Dicamba M 2.2 1

Dicamba T 2 1

Dicamba T 1.2 1

Dicamba T 4.2 1

Dicamba B 1.4 1

Dicamba B 0.5 1

Dicamba B 1.6 1

Dicamba B 0.2 1

Dicamba M 1.7 1

Dicamba M 2.4 1

Dicamba M 0.5 1

Dicamba M 2.1 1

Dicamba B 0.1 1

Dicamba M 2.2 1

Dicamba M 9.9 1

Dicamba M 1.8 1

Dicamba M 1.6 1

Dicamba T 1.7 1

Dicamba T 2.8 1

;

**proc** **mixed** data=f;

title "pool 4-day exp- diet ";

class treatment position run;

model diet= treatment position run treatment\*position;

lsmeans run / pdiff;

lsmeans position / pdiff;

**run**;**quit**;

////////////////////////////////////////

**First instar weight**

**data** m;

input treatment$ position$ rep weight;

cards;

C T 1 2.5

C M 1 2.2

C B 1 3.4

D T 2 2.9

D M 2 2.2

D B 2 3.1

;

**PROC** **mixed** data=m;

title " first instar weight";

class treatment rep position;

model weight=treatment rep position treatment\*position;

**run**;

**PROC** **glm** data=m;

title " first instar weight";

class treatment weight;

model weight=treatment;

**run**;

**PROC** **TTEST** DATA=m ALPHA=**0.05**;

VAR weight ;

**run**;**quit**;

///////////////////////////////

**Milkweed data-moisture, fiber and protein**

**data** a;

input treatment$ position$ moisture fiber year protein;

cards;

C T 80.45 2.49 2020 4.82

C M 74.94 3.70 2020 5.54

C T 80.93 3.05 2019 4.36

C M 80.85 2.57 2019 4.68

D T 81.13 2.77 2020 3.66

D M 80.47 2.83 2020 4.02

D T 81.38 2.77 2019 4.17

D M 80.06 3.23 2019 4.6

;

**proc** **mixed** data=a;

title " protein analysis";

class treatment position;

model protein= treatment position;

repeated / subject= treatment Group= position;

lsmeans position / pdiff;

**run**; **quit**;

**proc** **glm** data=a;

class treatment position;

model moisture= treatment position treatment\*position;

**run**;

**proc** **glm** data=a;

class treatment position;

model year= treatment position treatment\*position;

**run**;

**proc** **glm** data=a;

class treatment position;

model fiber= treatment position treatment\*position;

**run**;

**proc** **glm** data=a;

class treatment position;

model protein= treatment position treatment\*position;

**run**;

**PROC** **TTEST** DATA=a H0=**0** ALPHA=**0.05**;

class treatment;

VAR position moisture year fiber protein ;

**run**;**quit**;

**PROC** **TTEST** DATA=a H0=**0** ALPHA=**0.05**;

class position;

VAR moisture year fiber protein ;

**run**;**quit**;

///////////////////////////////////////////////////////

**First life cycle exp-pupaweight**

**data** a;

input treatment$ position$ rep pupaweight@@;

cards;

Control B 1 1.352

Control B 3 1.155

Control T 7 1.213

Control B 7 1.405

Control B 8 1.265

Control M 9 1.361

Control B 9 1.288

Control T 11 1.19

Control M 12 1.399

Control M 15 1.23

Dicamba T 1 0.984

Dicamba B 1 1.425

Dicamba B 2 1.145

Dicamba T 3 1.409

Dicamba T 4 1.191

Dicamba B 4 1.527

Dicamba B 6 1.327

Dicamba M 7 1.18

Dicamba M 9 1.411

Dicamba T 11 1.364

Dicamba M 11 0.998

;

**proc** **mixed** data=a;

title "two factor factorial experiment-F-life cycle exp";

class rep treatment position;

model pupaweight= rep treatment position treatment\*position;

lsmeans treatment / pdiff ;\*cl adjust=tukey;

**run**;**quit**;

**second life cycle exp-pupaweight**

**data** b;

input treatment$ position$ rep pupaweight@@;

cards;

Control T 1 1.233

Control M 1 0.973

Control B 1 1.065

Control M 2 1.344

Control T 3 1.114

Control M 3 1.223

Control B 3 1.09

Control M 4 1.078

Control T 5 1.332

Control B 5 1.062

Control T 6 1.195

Control M 6 1.081

Control B 6 1.146

Control T 7 1.286

Control B 7 1.388

Control T 8 1.226

Control M 8 1.262

Control T 9 1.3

Control M 9 1.372

Control B 9 1.245

Control T 10 1.23

Control M 10 1.071

Control B 10 1.083

Control T 11 1.3

Control M 11 1.413

Control T 12 0.94

Control M 12 1.144

Control B 12 1.219

Control T 13 1.245

Control M 13 1.122

Control B 13 1.044

Control T 14 1.454

Control M 14 1.37

Control B 14 1.092

Control T 15 1.013

Control M 15 1.124

Control B 15 1.097

Dicamba T 1 1.377

Dicamba M 1 1.174

Dicamba B 1 1.238

Dicamba T 2 1.179

Dicamba M 2 1.179

Dicamba B 2 1.153

Dicamba T 3 1.375

Dicamba M 3 1.4

Dicamba T 4 1.322

Dicamba M 4 1.231

Dicamba B 4 1.099

Dicamba T 5 1.296

Dicamba M 5 1.244

Dicamba T 6 1.012

Dicamba M 6 1.207

Dicamba T 7 1.388

Dicamba M 7 1.284

Dicamba T 8 1.221

Dicamba B 8 0.968

Dicamba M 9 1.25

Dicamba B 9 1.078

Dicamba T 10 1

Dicamba T 11 1.32

Dicamba M 11 1.414

Dicamba T 12 1.33

Dicamba B 12 1.075

Dicamba T 13 1.341

Dicamba M 13 1.01

Dicamba B 13 1.242

Dicamba T 14 1.321

Dicamba M 14 1.094

Dicamba B 14 0.87

Dicamba T 15 1.125

Dicamba M 15 0.933

Dicamba B 15 1.197

;

**proc** **mixed** data=b;

title "two factor factorial experiment-S life cycle exp";

class rep treatment position;

model pupaweight= rep treatment position treatment\*position;

lsmeans treatment / pdiff ;\*cl adjust=tukey;

**run**;**quit**;

**Pool first and second exps-pupaweight**

**data** n1;

input treatment$ position$ rep pupaweight;

cards;

Control B 1 1.352

Control B 2 1.155

Control T 3 1.213

Control B 4 1.405

Control B 5 1.265

Control M 6 1.361

Control B 7 1.288

Control T 8 1.19

Control M 9 1.399

Control M 10 1.23

Dicamba T 1 0.984

Dicamba B 1 1.425

Dicamba B 2 1.145

Dicamba T 3 1.409

Dicamba T 4 1.191

Dicamba B 5 1.527

Dicamba B 6 1.327

Dicamba M 7 1.18

Dicamba M 8 1.411

Dicamba T 9 1.364

Dicamba M 10 0.998

Control T 11 1.233

Control M 12 0.973

Control B 13 1.065

Control M 14 1.344

Control T 15 1.114

Control M 16 1.223

Control B 17 1.09

Control M 18 1.078

Control T 19 1.332

Control B 20 1.062

Control T 21 1.195

Control M 22 1.081

Control B 23 1.146

Control T 24 1.286

Control B 25 1.388

Control T 26 1.226

Control M 27 1.262

Control T 28 1.3

Control M 29 1.372

Control B 30 1.245

Control T 31 1.23

Control M 32 1.071

Control B 33 1.083

Control T 34 1.3

Control M 35 1.413

Control T 36 0.94

Control M 37 1.144

Control B 38 1.219

Control T 39 1.245

Control M 40 1.122

Control B 41 1.044

Control T 42 1.454

Control M 43 1.37

Control B 44 1.092

Control T 45 1.013

Control M 46 1.124

Control B 47 1.097

Dicamba T 11 1.377

Dicamba M 12 1.174

Dicamba B 13 1.238

Dicamba T 14 1.179

Dicamba M 15 1.179

Dicamba B 16 1.153

Dicamba T 17 1.375

Dicamba M 18 1.4

Dicamba T 19 1.322

Dicamba M 20 1.231

Dicamba B 21 1.099

Dicamba T 22 1.296

Dicamba M 23 1.244

Dicamba T 24 1.012

Dicamba M 25 1.207

Dicamba T 26 1.388

Dicamba M 27 1.284

Dicamba T 28 1.221

Dicamba B 29 0.968

Dicamba M 30 1.25

Dicamba B 31 1.078

Dicamba T 32 1

Dicamba T 33 1.32

Dicamba M 34 1.414

Dicamba T 35 1.33

Dicamba B 36 1.075

Dicamba T 37 1.341

Dicamba M 38 1.01

Dicamba B 39 1.242

Dicamba T 40 1.321

Dicamba M 41 1.094

Dicamba B 42 0.87

Dicamba T 43 1.125

Dicamba M 44 0.933

Dicamba B 45 1.197

;

**proc** **mixed** data=n1;

title "pupa weight- F&S whole exps combined";

class treatment rep position;

model pupaweight= treatment rep position treatment\*position;

lsmeans treatment / pdiff ;\*cl adjust=tukey;

lsmeans position / pdiff ;

**run**;**quit**;

**Second life cycle-rep and treatment effect on larvae weight**

**data** F;

input treatment$ position$ rep larvaeweight@@;

cards;

Control T 1 0.79

Control M 1 0.801

Control B 1 1.164

Control M 2 0.683

Control B 2 1.417

Control T 3 1.28

Control M 3 0.286

Control B 3 0.788

Control T 4 0.72

Control M 4 1.201

Control B 4 0.201

Control T 5 1.439

Control B 5 1.333

Control T 6 1.405

Control M 6 1.319

Control B 6 0.309

Control T 7 0.721

Control B 7 0.519

Control T 8 1.366

Control M 8 1.268

Control B 8 0.847

Control T 9 1.365

Control M 9 1.607

Control B 9 0.635

Control T 10 1.428

Control M 10 0.726

Control B 10 0.935

Control T 11 0.588

Control M 11 1.58

Control B 11 0.407

Control T 12 1.072

Control M 12 1.3

Control B 12 1.269

Control T 13 1.398

Control M 13 1.309

Control B 13 0.81

Control T 14 1.547

Control M 14 1.235

Control B 14 0.463

Control T 15 1.142

Control M 15 0.717

Control B 15 1.199

Dicamba T 1 1.642

Dicamba M 1 1.383

Dicamba B 1 0.818

Dicamba T 2 1.331

Dicamba M 2 0.543

Dicamba B 2 0.943

Dicamba T 3 1.564

Dicamba M 3 1.621

Dicamba B 3 0.744

Dicamba T 4 1.407

Dicamba M 4 1.374

Dicamba B 4 1.009

Dicamba T 5 1.479

Dicamba B 5 1.131

Dicamba T 6 1.204

Dicamba M 6 0.449

Dicamba T 7 1.602

Dicamba M 7 1.466

Dicamba T 8 1.383

Dicamba B 8 0.197

Dicamba T 9 0.971

Dicamba M 9 1.45

Dicamba B 9 0.03

Dicamba T 10 0.787

Dicamba B 10 0.106

Dicamba T 11 0.687

Dicamba M 11 1.659

Dicamba B 11 0.362

Dicamba T 12 1.539

Dicamba M 12 0.162

Dicamba B 12 0.287

Dicamba T 13 1.469

Dicamba M 13 1.093

Dicamba B 13 0.336

Dicamba T 14 1.471

Dicamba M 14 0.939

Dicamba B 14 0.976

Dicamba T 15 1.26

Dicamba M 15 1.154

Dicamba B 15 0.423

;

**proc** **mixed** data=F;

title "two factor factorial experiment-S-whole exp";

class rep treatment position;

model larvaeweight= rep treatment position treatment\*position;

lsmeans treatment / pdiff ;\*cl adjust=tukey;

lsmeans position / pdiff ;

**run**;**quit**;

**Second life cycle exp-larvae weight**

**data** a;

input treatment$ position$ rep larvaeweight@@;

cards;

Control T 1 0.79

Control M 1 0.801

Control B 1 1.164

Control M 2 14.31

Control B 2 1.417

Control T 3 1.28

Control M 3 0.286

Control B 3 0.788

Control T 4 0.72

Control M 4 1.201

Control B 4 0.201

Control T 5 1.439

Control B 5 1.333

Control T 6 1.405

Control M 6 1.319

Control B 6 0.309

Control T 7 14.348

Control B 7 0.519

Control T 8 1.366

Control M 8 1.268

Control B 8 0.847

Control T 9 1.365

Control M 9 1.607

Control B 9 0.635

Control T 10 1.428

Control M 10 0.726

Control B 10 0.935

Control T 11 14.213

Control M 11 1.58

Control B 11 0.407

Control T 12 1.072

Control M 12 1.3

Control B 12 1.269

Control T 13 1.398

Control M 13 1.309

Control B 13 0.81

Control T 14 1.547

Control M 14 1.235

Control B 14 0.463

Control T 15 1.142

Control M 15 14.344

Control B 15 1.199

Dicamba T 1 1.642

Dicamba M 1 1.383

Dicamba B 1 0.818

Dicamba T 2 1.331

Dicamba M 2 0.543

Dicamba B 2 0.943

Dicamba T 3 1.564

Dicamba M 3 1.621

Dicamba B 3 0.744

Dicamba T 4 1.407

Dicamba M 4 1.374

Dicamba B 4 1.009

Dicamba T 5 1.479

Dicamba B 5 1.131

Dicamba T 6 1.204

Dicamba M 6 0.449

Dicamba T 7 1.602

Dicamba M 7 1.466

Dicamba T 8 1.383

Dicamba B 8 0.197

Dicamba T 9 0.971

Dicamba M 9 1.45

Dicamba B 9 0.03

Dicamba T 10 0.787

Dicamba B 10 0.106

Dicamba T 11 0.687

Dicamba M 11 1.659

Dicamba B 11 0.362

Dicamba T 12 1.539

Dicamba M 12 0.162

Dicamba B 12 0.287

Dicamba T 13 1.469

Dicamba M 13 1.093

Dicamba B 13 0.336

Dicamba T 14 1.471

Dicamba M 14 0.939

Dicamba B 14 0.976

Dicamba T 15 1.26

Dicamba M 15 1.154

Dicamba B 15 0.423

;

**proc** **mixed** data=a;

title "two factor factorial experiment-S life cycle exp";

class rep treatment position;

model larvaeweight= rep treatment position treatment\*position;

lsmeans treatment / pdiff ;

**run**;**quit**;

**data** a;

input treatment$ position$ rep larvaeweight@@;

cards;

Control T 1 0.79

Control M 1 0.801

Control B 1 1.164

Control M 2 14.31

Control B 2 1.417

Control T 3 1.28

Control M 3 0.286

Control B 3 0.788

Control T 4 0.72

Control M 4 1.201

Control B 4 0.201

Control T 5 1.439

Control B 5 1.333

Control T 6 1.405

Control M 6 1.319

Control B 6 0.309

Control T 7 14.348

Control B 7 0.519

Control T 8 1.366

Control M 8 1.268

Control B 8 0.847

Control T 9 1.365

Control M 9 1.607

Control B 9 0.635

Control T 10 1.428

Control M 10 0.726

Control B 10 0.935

Control T 11 14.213

Control M 11 1.58

Control B 11 0.407

Control T 12 1.072

Control M 12 1.3

Control B 12 1.269

Control T 13 1.398

Control M 13 1.309

Control B 13 0.81

Control T 14 1.547

Control M 14 1.235

Control B 14 0.463

Control T 15 1.142

Control M 15 14.344

Control B 15 1.199

Dicamba T 1 1.642

Dicamba M 1 1.383

Dicamba B 1 0.818

Dicamba T 2 1.331

Dicamba M 2 0.543

Dicamba B 2 0.943

Dicamba T 3 1.564

Dicamba M 3 1.621

Dicamba B 3 0.744

Dicamba T 4 1.407

Dicamba M 4 1.374

Dicamba B 4 1.009

Dicamba T 5 1.479

Dicamba B 5 1.131

Dicamba T 6 1.204

Dicamba M 6 0.449

Dicamba T 7 1.602

Dicamba M 7 1.466

Dicamba T 8 1.383

Dicamba B 8 0.197

Dicamba T 9 0.971

Dicamba M 9 1.45

Dicamba B 9 0.03

Dicamba T 10 0.787

Dicamba B 10 0.106

Dicamba T 11 0.687

Dicamba M 11 1.659

Dicamba B 11 0.362

Dicamba T 12 1.539

Dicamba M 12 0.162

Dicamba B 12 0.287

Dicamba T 13 1.469

Dicamba M 13 1.093

Dicamba B 13 0.336

Dicamba T 14 1.471

Dicamba M 14 0.939

Dicamba B 14 0.976

Dicamba T 15 1.26

Dicamba M 15 1.154

Dicamba B 15 0.423

;

**proc** **glm** data=a;

title "two factor factorial experiment-Second whole exp";

class treatment position rep;

model larvaeweight= treatment position rep treatment\*position;

lsmeans treatment position;

**run**;**quit**;

**Second four day exp**

**data** b;

input treatment$ position$ rep weight@@;

cards;

Control T 1 0.055

Control M 1 0.012

Control B 1 0.012

Control T 2 0.03

Control M 2 0.018

Control B 2 0.013

Control T 3 0.041

Control M 3 0.028

Control B 3 0.02

Control T 4 0.065

Control M 4 0.049

Control B 4 0.031

Control M 5 0.03

Control B 5 0.036

Control T 6 0.078

Control M 6 0.057

Control B 6 0.061

Control T 7 0.048

Control M 7 0.032

Control B 7 0.052

Control T 8 0.061

Control M 8 0.029

Control B 8 0.026

Control T 9 0.042

Control M 9 0.066

Control B 9 0.018

Control T 10 0.067

Control M 10 0.039

Control B 10 0.023

Dicamba T 1 0.046

Dicamba M 1 0.015

Dicamba B 1 0.051

Dicamba T 2 0.047

Dicamba M 2 0.049

Dicamba T 3 0.051

Dicamba M 3 0.032

Dicamba B 3 0.012

Dicamba T 4 0.002

Dicamba M 4 0.027

Dicamba B 4 0.036

Dicamba T 5 0.036

Dicamba M 5 0.017

Dicamba B 5 0.002

Dicamba T 6 0.079

Dicamba M 6 0.059

Dicamba T 7 0.07

Dicamba M 7 0.064

Dicamba B 7 0.021

Dicamba T 8 0.019

Dicamba M 8 0.017

Dicamba B 8 0.015

Dicamba T 9 0.049

Dicamba M 9 0.05

Dicamba B 9 0.012

Dicamba T 10 0.033

Dicamba M 10 0.037

Dicamba B 10 0.062

;

**proc** **mixed** data=b;

title "two factor factorial experiment-Second 4day exp";

class treatment position rep;

model weight= treatment position rep treatment\*position;

lsmeans treatment position/ pdiff;

**run**;**quit**;

**proc** **means** data=b;

by treatment;

var weight;

class position treatment;

**run**;

**Second four-day exp-treatment\*position\*weight**

**data** b;

input treatment$ position$ rep weight@@;

cards;

Control T 1 0.055

Control M 1 0.012

Control B 1 0.012

Control T 2 0.03

Control M 2 0.018

Control B 2 0.013

Control T 3 0.041

Control M 3 0.028

Control B 3 0.02

Control T 4 0.065

Control M 4 0.049

Control B 4 0.031

Control M 5 0.03

Control B 5 0.036

Control T 6 0.078

Control M 6 0.057

Control B 6 0.061

Control T 7 0.048

Control M 7 0.032

Control B 7 0.052

Control T 8 0.061

Control M 8 0.029

Control B 8 0.026

Control T 9 0.042

Control M 9 0.066

Control B 9 0.018

Control T 10 0.067

Control M 10 0.039

Control B 10 0.023

Dicamba T 1 0.046

Dicamba M 1 0.015

Dicamba B 1 0.051

Dicamba T 2 0.047

Dicamba M 2 0.049

Dicamba T 3 0.051

Dicamba M 3 0.032

Dicamba B 3 0.012

Dicamba T 4 0.002

Dicamba M 4 0.027

Dicamba B 4 0.036

Dicamba T 5 0.036

Dicamba M 5 0.017

Dicamba B 5 0.002

Dicamba T 6 0.079

Dicamba M 6 0.059

Dicamba T 7 0.07

Dicamba M 7 0.064

Dicamba B 7 0.021

Dicamba T 8 0.019

Dicamba M 8 0.017

Dicamba B 8 0.015

Dicamba T 9 0.049

Dicamba M 9 0.05

Dicamba B 9 0.012

Dicamba T 10 0.033

Dicamba M 10 0.037

Dicamba B 10 0.062

;

**proc** **mixed** data=b;

title "two factor factorial experiment-s 4day exp";

class treatment position rep;

model weight= treatment position rep treatment\*position;

lsmeans treatment / pdiff ;

lsmeans position / pdiff ;

**run**;**quit**;

**proc** **means** data=b;

class treatment position;

var weight;

**run**;

**first four day exp-larvae weight**

data b;

input treatment$ position$ rep weight@@;

cards;

Control B 1 0.018

Control B 1 0.02

Control B 1 0.019

Control B 1 0.02

Control M 1 0.001

Control M 1 0.04

Control M 1 0.04

Control T 1 0.04

Control T 1 0.015

Control B 2 0.002

Control B 2 0.002

Control B 2 0.02

Control B 2 0.018

Control M 2 0.021

Control M 2 0.016

Control M 2 0.014

Control T 2 0.001

Control T 2 0.002

Control T 2 0.088

Control T 2 0.072

Control B 3 0.003

Control B 3 0.015

Control B 3 0.001

Control B 3 0.018

Control M 3 0.036

Control M 3 0.044

Control M 3 0.03

Control T 3 0.075

Control T 3 0.08

Control B 4 0.01

Control B 4 0.027

Control B 4 0.037

Control B 4 0.019

Control M 4 0.016

Control M 4 0.035

Control M 4 0.004

Control M 4 0.004

Control T 4 0.063

Control T 4 0.043

Control T 4 0.04

Control T 4 0.021

Control B 5 0.02

Control B 5 0.02

Control B 5 0.021

Control B 5 0.02

Control M 5 0.022

Control M 5 0.043

Control M 5 0.04

Control T 5 0.03

Control T 5 0.016

Control T 5 0.05

Control B 6 0.04

Control B 6 0.019

Control M 6 0.038

Control M 6 0.017

Control M 6 0.04

Control M 6 0.026

Control T 6 0.04

Control T 6 0.07

Control T 6 0.03

Control B 7 0.02

Control B 7 0.021

Control B 7 0.01

Control M 7 0.013

Control M 7 0.025

Control M 7 0.038

Control M 7 0.032

Control T 7 0.041

Control T 7 0.045

Control B 8 0.015

Control B 8 0.035

Control B 8 0.035

Control B 8 0.03

Control M 8 0.056

Control M 8 0.022

Control M 8 0.029

Control M 8 0.049

Control T 8 0.032

Control T 8 0.013

Control T 8 0.035

Dicamba B 1 0.02

Dicamba B 1 0.019

Dicamba B 1 0.015

Dicamba M 1 0.031

Dicamba M 1 0.036

Dicamba M 1 0.031

Dicamba T 1 0.033

Dicamba T 1 0.012

Dicamba T 1 0.06

Dicamba B 2 0.026

Dicamba B 2 0.021

Dicamba B 2 0.002

Dicamba M 2 0.025

Dicamba M 2 0.039

Dicamba M 2 0.038

Dicamba M 2 0.021

Dicamba T 2 0.002

Dicamba T 2 0.036

Dicamba T 2 0.016

Dicamba B 3 0.017

Dicamba B 3 0.024

Dicamba B 3 0.015

Dicamba M 3 0.021

Dicamba M 3 0.03

Dicamba M 3 0.041

Dicamba T 3 0.041

Dicamba B 4 0.032

Dicamba B 4 0.021

Dicamba B 4 0.016

Dicamba B 4 0.011

Dicamba M 4 0.011

Dicamba M 4 0.017

Dicamba M 4 0.038

Dicamba T 4 0.088

Dicamba T 4 0.045

Dicamba T 4 0.004

Dicamba B 5 0.023

Dicamba B 5 0.019

Dicamba B 5 0.034

Dicamba T 5 0.027

Dicamba T 5 0.042

Dicamba T 5 0.045

Dicamba T 5 0.005

Dicamba B 6 0.024

Dicamba B 6 0.001

Dicamba B 6 0.061

Dicamba B 6 0.017

Dicamba M 6 0.001

Dicamba M 6 0.04

Dicamba M 6 0.046

Dicamba M 6 0.036

Dicamba T 6 0.032

Dicamba T 6 0.014

Dicamba T 6 0.044

Dicamba B 7 0.017

Dicamba B 7 0.01

Dicamba B 7 0.02

Dicamba B 7 0.01

Dicamba M 7 0.007

Dicamba M 7 0.038

Dicamba M 7 0.014

Dicamba M 7 0.007

Dicamba B 8 0.01

Dicamba M 8 0.037

Dicamba M 8 0.028

Dicamba M 8 0.03

Dicamba M 8 0.008

Dicamba T 8 0.021

Dicamba T 8 0.044

proc glm data=b;

title "two factor factorial experiment- first four day exp";

class treatment position rep;

model larvaeweight= treatment position rep treatment\*position;

lsmeans treatment position;

run;

////////////////////////////////////////////////////////////////

**Survival first and second life cycle exps**

**data** a;

input treatment$ position$ larvae pupa adult; \*F whole exp;

cards;

C B 73.3 33.3 20

C M 73.3 20.0 6.6

C T 73.3 26.6 26.6

D B 80.0 26.6 20

D M 60.0 20.0 20

D T 66.0 26.6 13.3

;

**PROC** **TTEST** DATA=a H0=**0** ALPHA=**0.05**;

class treatment;

VAR larvae pupa adult ;

**run**;**quit**;

**data** b;

input treatment$ run position$ larvae pupa adult;

cards;

C 1 B 73.3 33.3 20

C 1 M 73.3 20 6.6

C 1 T 73.3 26.6 26.6

D 1 B 80 26.6 20

D 1 M 60 20 20

D 1 T 66 26.6 13.3

C 2 B 100 86.6 73.3

C 2 M 86.6 86.6 86.6

C 2 T 93.3 93.3 93.3

D 2 B 86.6 66.6 66.6

D 2 M 86.6 80 80

D 2 T 100 93.3 86.6

;

**proc** **glm** data=b;

title "percent survival-F&S life cycle exp";

class treatment run;

model larvae= treatment run treatment\*run;

**run**;**quit**;

**proc** **glm** data=b;

title "percent survival-F&S whole exp";

class treatment position run;

model larvae= position run position\*run;

**run**;**quit**;

**proc** **glm** data=b;

title "percent survival-F&S whole exp";

class treatment run;

model pupa= treatment run treatment\*run;

**run**;**quit**;

**proc** **glm** data=b;

title "percent survival-F&S whole exp";

class treatment run;

model adult= treatment run treatment\*run;

**run**;**quit**;

**Survival first(2019) and second(2020) 4-day exps**

**data** c;

input treatment$ year position$ larvae;

cards;

C 2020 B 100

C 2020 M 100

C 2020 T 90

D 2020 B 80

D 2020 M 100

D 2020 T 100

C 2019 B 90.62

C 2019 M 93.75

C 2019 T 81.25

D 2019 B 93.75

D 2019 M 90.62

D 2019 T 87.5

;

**proc** **glm** data=c;

title "percent survival-2020&2019 4-day exp";

class treatment year;

model larvae= treatment year treatment\*year;

**run**;**quit**;

**proc** **glm** data=c;

title "percent survival-2020&2019 4-day exp";

class treatment position year;

model larvae= position year position\*year;

**run**;**quit**;

////////////////////////////////////////////////////////////////

2019 and 2020 egg countings, milkweed injury level

**data** a;

input eggs injury@@;

cards;

8 5

16 0

15 0

11 1

12 0

13 0

12 0

15 1

3 0

1 5

8 2

10 0

14 0

2 1

;

**proc** **reg** data=a;

model eggs= injury;

title "simple linear regression-2020eggs";

**run**;**quit**;

**data** b;

input eggs injury@@;

cards;

3 3

2 3

4 1

7 1

4 3

4 2

5 2

3 5

2 0

2 2

7 2

4 3

;

**proc** **reg** data=b;

model eggs=injury;

title2 "simple linear regression-2019eggs";

**run**;**quit**;

**data** f;

input year injury eggs@@;

cards;

2020 5 8

2020 0 16

2020 0 15

2020 1 11

2020 0 12

2020 0 13

2020 0 12

2020 1 15

2020 0 3

2020 5 1

2020 2 8

2020 0 10

2020 0 14

2020 1 2

2019 3 3

2019 3 2

2019 1 4

2019 1 7

2019 3 4

2019 2 4

2019 2 5

2019 5 3

2019 0 2

2019 2 2

2019 2 7

2019 3 4

;

**proc** **sgplot** data=f;

reg x=injury y=eggs/ group=year ;

title2 "linear regression-2019&2020 eggs";

**run**;**quit**;

**data** d;

input year injury;

cards;

2020 5

2020 0

2020 0

2020 1

2020 0

2020 0

2020 0

2020 1

2020 0

2020 5

2020 2

2020 0

2020 0

2020 1

2019 3

2019 3

2019 1

2019 1

2019 3

2019 2

2019 2

2019 5

2019 0

2019 2

2019 2

2019 3

;

**proc** **ttest** data=d;

class year;

var injury;

**run**;**quit**;

///////////////////////////////////////////////

**First life cycle exp-larvae weight**

**data** a;

input treatment$ position$ rep larvaeweight@@;

cards;

Control M 1 0.569

Control B 1 0.877

Control T 2 1.351

Control B 2 0.78

Control T 3 0.108

Control M 3 0.25

Control B 3 0.773

Control M 4 0.054

Control M 5 0.66

Control B 5 0.413

Control T 6 0.861

Control B 6 0.958

Control T 7 1.091

Control M 7 0.716

Control B 7 1.508

Control T 8 0.427

Control B 8 1.315

Control M 9 1.615

Control B 9 1.329

Control T 10 0.199

Control M 10 0.756

Control B 10 0.846

Control T 11 0.93

Control M 11 0.134

Control B 11 1.357

Control T 12 1.197

Control M 12 1.438

Control T 13 1.076

Control M 13 1.574

Control T 14 0.965

Control B 14 1.008

Control T 15 0.565

Control M 15 1.123

Dicamba T 1 0.847

Dicamba M 1 0.298

Dicamba B 1 1.597

Dicamba M 2 0.646

Dicamba B 2 0.859

Dicamba T 3 1.214

Dicamba B 3 0.031

Dicamba T 4 1.202

Dicamba M 4 0.906

Dicamba B 4 1.702

Dicamba T 5 0.125

Dicamba T 6 0.821

Dicamba B 6 1.386

Dicamba T 7 0.408

Dicamba M 7 1.321

Dicamba B 7 1.075

Dicamba M 8 0.286

Dicamba T 9 0.875

Dicamba M 9 1.306

Dicamba B 9 0.165

Dicamba T 10 0.188

Dicamba B 10 0.268

Dicamba T 11 1.419

Dicamba M 11 0.688

Dicamba B 11 1.243

Dicamba B 12 1.243

Dicamba T 13 1.327

Dicamba B 13 0.034

Dicamba M 14 0.576

Dicamba M 15 1.641

Dicamba B 15 0.291

;

**proc** **glm** data=a;

title "two factor factorial experiment-First whole exp";

class treatment position rep;

model larvaeweight= treatment position rep treatment\*position;

lsmeans treatment position;

**run**;**quit**;

**proc** **mixed** data=a;

title "two factor factorial experiment-First whole exp";

class rep treatment position;

model larvaeweight= rep treatment position treatment\*position;

lsmeans treatment / pdiff ;\*cl adjust=tukey;

**run**;**quit**;

**data** C;

input treatment$ run position$ rep larvae;

cards;

Control 1 M 1 0.569

Control 1 B 1 0.877

Control 1 T 2 1.351

Control 1 B 2 0.78

Control 1 T 3 0.108

Control 1 M 3 0.25

Control 1 B 3 0.773

Control 1 M 4 0.054

Control 1 M 5 0.66

Control 1 B 5 0.413

Control 1 T 6 0.861

Control 1 B 6 0.958

Control 1 T 7 1.091

Control 1 M 7 0.716

Control 1 B 7 1.508

Control 1 T 8 0.427

Control 1 B 8 1.315

Control 1 M 9 1.615

Control 1 B 9 1.329

Control 1 T 10 0.199

Control 1 M 10 0.756

Control 1 B 10 0.846

Control 1 T 11 0.93

Control 1 M 11 0.134

Control 1 B 11 1.357

Control 1 T 12 1.197

Control 1 M 12 1.438

Control 1 T 13 1.076

Control 1 M 13 1.574

Control 1 T 14 0.965

Control 1 B 14 1.008

Control 1 T 15 0.565

Control 1 M 15 1.123

Dicamba 1 T 1 0.847

Dicamba 1 M 1 0.298

Dicamba 1 B 1 1.597

Dicamba 1 M 2 0.646

Dicamba 1 B 2 0.859

Dicamba 1 T 3 1.214

Dicamba 1 B 3 0.031

Dicamba 1 T 4 1.202

Dicamba 1 M 4 0.906

Dicamba 1 B 4 1.702

Dicamba 1 T 5 0.125

Dicamba 1 T 6 0.821

Dicamba 1 B 6 1.386

Dicamba 1 T 7 0.408

Dicamba 1 M 7 1.321

Dicamba 1 B 7 1.075

Dicamba 1 M 8 0.286

Dicamba 1 T 9 0.875

Dicamba 1 M 9 1.306

Dicamba 1 B 9 0.165

Dicamba 1 T 10 0.188

Dicamba 1 B 10 0.268

Dicamba 1 T 11 1.419

Dicamba 1 M 11 0.688

Dicamba 1 B 11 1.243

Dicamba 1 B 12 1.243

Dicamba 1 T 13 1.327

Dicamba 1 B 13 0.034

Dicamba 1 M 14 0.576

Dicamba 1 M 15 1.641

Dicamba 1 B 15 0.291

Control 2 T 1 0.79

Control 2 M 1 0.801

Control 2 B 1 1.164

Control 2 M 2 0.683

Control 2 B 2 1.417

Control 2 T 3 1.28

Control 2 M 3 0.286

Control 2 B 3 0.788

Control 2 T 4 0.72

Control 2 M 4 1.201

Control 2 B 4 0.201

Control 2 T 5 1.439

Control 2 B 5 1.333

Control 2 T 6 1.405

Control 2 M 6 1.319

Control 2 B 6 0.309

Control 2 T 7 0.721

Control 2 B 7 0.519

Control 2 T 8 1.366

Control 2 M 8 1.268

Control 2 B 8 0.847

Control 2 T 9 1.365

Control 2 M 9 1.607

Control 2 B 9 0.635

Control 2 T 10 1.428

Control 2 M 10 0.726

Control 2 B 10 0.935

Control 2 T 11 0.588

Control 2 M 11 1.58

Control 2 B 11 0.407

Control 2 T 12 1.072

Control 2 M 12 1.3

Control 2 B 12 1.269

Control 2 T 13 1.398

Control 2 M 13 1.309

Control 2 B 13 0.81

Control 2 T 14 1.547

Control 2 M 14 1.235

Control 2 B 14 0.463

Control 2 T 15 1.142

Control 2 M 15 0.717

Control 2 B 15 1.199

Dicamba 2 T 1 1.642

Dicamba 2 M 1 1.383

Dicamba 2 B 1 0.818

Dicamba 2 T 2 1.331

Dicamba 2 M 2 0.543

Dicamba 2 B 2 0.943

Dicamba 2 T 3 1.564

Dicamba 2 M 3 1.621

Dicamba 2 B 3 0.744

Dicamba 2 T 4 1.407

Dicamba 2 M 4 1.374

Dicamba 2 B 4 1.009

Dicamba 2 T 5 1.479

Dicamba 2 B 5 1.131

Dicamba 2 T 6 1.204

Dicamba 2 M 6 0.449

Dicamba 2 T 7 1.602

Dicamba 2 M 7 1.466

Dicamba 2 T 8 1.383

Dicamba 2 B 8 0.197

Dicamba 2 T 9 0.971

Dicamba 2 M 9 1.45

Dicamba 2 B 9 0.03

Dicamba 2 T 10 0.787

Dicamba 2 B 10 0.106

Dicamba 2 T 11 0.687

Dicamba 2 M 11 1.659

Dicamba 2 B 11 0.362

Dicamba 2 T 12 1.539

Dicamba 2 M 12 0.162

Dicamba 2 B 12 0.287

Dicamba 2 T 13 1.469

Dicamba 2 M 13 1.093

Dicamba 2 B 13 0.336

Dicamba 2 T 14 1.471

Dicamba 2 M 14 0.939

Dicamba 2 B 14 0.976

Dicamba 2 T 15 1.26

Dicamba 2 M 15 1.154

Dicamba 2 B 15 0.423

;

**proc** **glm** data=c;

title "F&S whole exp";

class treatment run;

model larvae= treatment year treatment\*year;

**run**;**quit**;

**proc** **glm** data=c;

title "F&S whole exp";

class treatment position run;

model larvae= position run position\*run;

**run**;**quit**;

**data** C;

input treatment$ run position$ rep larvae;

cards;

Control 1 M 1 0.569

Control 1 B 1 0.877

Control 1 T 2 1.351

Control 1 B 2 0.78

Control 1 T 3 0.108

Control 1 M 3 0.25

Control 1 B 3 0.773

Control 1 M 4 0.054

Control 1 M 5 0.66

Control 1 B 5 0.413

Control 1 T 6 0.861

Control 1 B 6 0.958

Control 1 T 7 1.091

Control 1 M 7 0.716

Control 1 B 7 1.508

Control 1 T 8 0.427

Control 1 B 8 1.315

Control 1 M 9 1.615

Control 1 B 9 1.329

Control 1 T 10 0.199

Control 1 M 10 0.756

Control 1 B 10 0.846

Control 1 T 11 0.93

Control 1 M 11 0.134

Control 1 B 11 1.357

Control 1 T 12 1.197

Control 1 M 12 1.438

Control 1 T 13 1.076

Control 1 M 13 1.574

Control 1 T 14 0.965

Control 1 B 14 1.008

Control 1 T 15 0.565

Control 1 M 15 1.123

Dicamba 1 T 1 0.847

Dicamba 1 M 1 0.298

Dicamba 1 B 1 1.597

Dicamba 1 M 2 0.646

Dicamba 1 B 2 0.859

Dicamba 1 T 3 1.214

Dicamba 1 B 3 0.031

Dicamba 1 T 4 1.202

Dicamba 1 M 4 0.906

Dicamba 1 B 4 1.702

Dicamba 1 T 5 0.125

Dicamba 1 T 6 0.821

Dicamba 1 B 6 1.386

Dicamba 1 T 7 0.408

Dicamba 1 M 7 1.321

Dicamba 1 B 7 1.075

Dicamba 1 M 8 0.286

Dicamba 1 T 9 0.875

Dicamba 1 M 9 1.306

Dicamba 1 B 9 0.165

Dicamba 1 T 10 0.188

Dicamba 1 B 10 0.268

Dicamba 1 T 11 1.419

Dicamba 1 M 11 0.688

Dicamba 1 B 11 1.243

Dicamba 1 B 12 1.243

Dicamba 1 T 13 1.327

Dicamba 1 B 13 0.034

Dicamba 1 M 14 0.576

Dicamba 1 M 15 1.641

Dicamba 1 B 15 0.291

;

**proc** **mixed** data=c;

title "F whole exp";

class treatment position;

model larvae= treatment position treatment\*position;

lsmeans position / pdiff;

**run**;**quit**;

////////////////////////////////////////////

**Second life cycle-treatment and rep effect on wing and sex**

**data** c;

input treatment$ position$ rep wing sex;

cards;

Control T 1 5.1 0

Control M 1 4.9 1

Control B 1 4.7 1

Control T 2 4.7 1

Control M 2 5.2 1

Control T 3 4.6 1

Control M 3 5.2 1

Control B 3 4.9 0

Control M 4 4.8 1

Control T 5 4.9 0

Control B 5 4.9 1

Control T 6 5 1

Control M 6 4.8 0

Control B 6 4.7 1

Control T 7 5 0

Control B 7 5.2 0

Control T 8 4.7 0

Control M 8 5.3 0

Control T 9 5.2 0

Control M 9 5.3 0

Control B 9 5 0

Control T 10 5 1

Control M 10 4.7 0

Control B 10 4.7 1

Control T 11 5.1 0

Control M 11 5.2 0

Control T 12 4.7 1

Control M 12 4.9 1

Control B 12 4.9 0

Control T 13 5.1 0

Control M 13 4.8 0

Control B 13 4.8 1

Control T 14 5.3 1

Control M 14 4.7 0

Control B 14 4.7 0

Control T 15 4.8 1

Control M 15 4.7 0

Control B 15 5 0

Dicamba T 1 5.2 0

Dicamba M 1 5 0

Dicamba B 1 5 0

Dicamba T 2 4.8 1

Dicamba M 2 5 1

Dicamba B 2 4.9 1

Dicamba T 3 5.1 0

Dicamba M 3 5.2 0

Dicamba B 3 4.7 1

Dicamba T 4 4.9 1

Dicamba M 4 5 0

Dicamba B 4 4.7 1

Dicamba T 5 5.1 0

Dicamba M 5 5 1

Dicamba T 6 4.8 1

Dicamba M 6 4.9 0

Dicamba T 7 5.2 1

Dicamba M 7 5.1 0

Dicamba T 8 4.7 1

Dicamba B 8 5 1

Dicamba M 9 5.2 1

Dicamba B 9 5.2 1

Dicamba T 10 4.6 1

Dicamba M 11 5.2 0

Dicamba T 12 5.1 0

Dicamba B 12 5 0

Dicamba T 13 5.1 0

Dicamba M 13 4.6 1

Dicamba B 13 5.1 0

Dicamba T 14 5.1 1

Dicamba M 14 4.9 0

Dicamba B 14 4.7 1

Dicamba T 15 4.8 1

Dicamba M 15 4.6 1

Dicamba B 15 5 0

;

**proc** **mixed** data=c;

title "two factor factorial experiment-S life cycle wing&sex";

class rep treatment;

model wing = rep treatment;

lsmeans treatment / pdiff;

**run**;**quit**;

**proc** **mixed** data=c;

title "two factor factorial experiment-S life cycle wing&sex";

class rep treatment;

model sex = rep treatment;

lsmeans treatment / pdiff;

**run**;**quit**;

**data** f;

input treatment$ run pupaweight winglength sex;

cards;

Control 1 1.352 5.1 0

Control 1 1.155 4.9 1

Control 1 1.213 4.5 0

Control 1 1.405 4.7 0

Control 1 1.265 5.1 1

Control 1 1.361 4.9 0

Control 1 1.288 4.8 1

Control 1 1.19 4.8 1

Control 1 1.399 4.2 1

Control 1 1.23 4.9 0

Dicamba 1 0.984 4.5 1

Dicamba 1 1.425 4.5 1

Dicamba 1 1.145 5.1 0

Dicamba 1 1.409 4.9 1

Dicamba 1 1.191 5.2 1

Dicamba 1 1.527 5.3 0

Dicamba 1 1.327 4.9 0

Dicamba 1 1.18 4.5 1

Dicamba 1 1.411

Dicamba 1 1.364

Dicamba 1 0.998

Control 2 1.233 5.1 0

Control 2 0.973 4.9 1

Control 2 1.065 4.7 1

Control 2 1.344 4.7 1

Control 2 1.114 5.2 1

Control 2 1.223 4.6 1

Control 2 1.09 5.2 1

Control 2 1.078 4.9 0

Control 2 1.332 4.8 1

Control 2 1.062 4.9 0

Control 2 1.195 4.9 1

Control 2 1.081 5 1

Control 2 1.146 4.8 0

Control 2 1.286 4.7 1

Control 2 1.388 5 0

Control 2 1.226 5.2 0

Control 2 1.262 4.7 0

Control 2 1.3 5.3 0

Control 2 1.372 5.2 0

Control 2 1.245 5.3 0

Control 2 1.23 5 0

Control 2 1.071 5 1

Control 2 1.083 4.7 0

Control 2 1.3 4.7 1

Control 2 1.413 5.1 0

Control 2 0.94 5.2 0

Control 2 1.144 4.7 1

Control 2 1.219 4.9 1

Control 2 1.245 4.9 0

Control 2 1.122 5.1 0

Control 2 1.044 4.8 0

Control 2 1.454 4.8 1

Control 2 1.37 5.3 1

Control 2 1.092 4.7 0

Control 2 1.013 4.7 0

Control 2 1.124 4.8 1

Control 2 1.097 4.7 0

Dicamba 2 1.377 5 0

Dicamba 2 1.174 5.2 0

Dicamba 2 1.238 5 0

Dicamba 2 1.179 5 0

Dicamba 2 1.179 4.8 1

Dicamba 2 1.153 5 1

Dicamba 2 1.375 4.9 1

Dicamba 2 1.4 5.1 0

Dicamba 2 1.322 5.2 0

Dicamba 2 1.231 4.7 1

Dicamba 2 1.099 4.9 1

Dicamba 2 1.296 5 0

Dicamba 2 1.244 4.7 1

Dicamba 2 1.012 5.1 0

Dicamba 2 1.207 5 1

Dicamba 2 1.388 4.8 1

Dicamba 2 1.284 4.9 0

Dicamba 2 1.221 5.2 1

Dicamba 2 0.968 5.1 0

Dicamba 2 1.25 4.7 1

Dicamba 2 1.078 5 1

Dicamba 2 1 5.2 1

Dicamba 2 1.32 5.2 1

Dicamba 2 1.414 4.6 1

Dicamba 2 1.33 5.2 0

Dicamba 2 1.075 5.1 0

Dicamba 2 1.341 5 0

Dicamba 2 1.01 5.1 0

Dicamba 2 1.242 4.6 1

Dicamba 2 1.321 5.1 0

Dicamba 2 1.094 5.1 1

Dicamba 2 0.87 4.9 0

Dicamba 2 1.125 4.7 1

Dicamba 2 0.933 4.8 1

Dicamba 2 1.197 4.6 1

;

**proc** **mixed** data=f;

title "F&S whole exp";

class treatment run;

model pupaweight= treatment run treatment\*run;

lsmeans treatment / pdiff;

**run**;**quit**;

**proc** **mixed** data=f;

title "F&S whole exp";

class treatment run;

model winglength= treatment run treatment\*run;

lsmeans treatment / pdiff;

**run**;**quit**;

**proc** **mixed** data=f;

title "F&S whole exp";

class treatment run;

model sex= treatment run treatment\*run;

lsmeans treatment / pdiff;

**run**;**quit**;

**data** c;

input treatment$ sex@@;

cards;

Dicamba 0

Dicamba 0

Dicamba 0

Dicamba 1

Dicamba 1

Dicamba 1

Dicamba 0

Dicamba 0

Dicamba 1

Dicamba 1

Dicamba 0

Dicamba 1

Dicamba 0

Dicamba 1

Dicamba 1

Dicamba 0

Dicamba 1

Dicamba 0

Dicamba 1

Dicamba 1

Dicamba 1

Dicamba 1

Dicamba 1

Dicamba 0

Dicamba 0

Dicamba 0

Dicamba 0

Dicamba 1

Dicamba 0

Dicamba 1

Dicamba 0

Dicamba 1

Dicamba 1

Dicamba 1

Dicamba 0

;

**PROC** **TTEST** DATA=c H0=**0.44** ALPHA=**0.05**;

VAR sex ;

TITLE 'TTEST OF H0: MEAN=0.44';

**run**;**quit**;

**data** a;

input treatment$ sex@@;

cards;

dicamba 1

dicamba 0

dicamba 1

dicamba 1

dicamba 0

dicamba 0

dicamba 1

;

**PROC** **TTEST** DATA=a H0=**0.54** ALPHA=**0.05**;

VAR sex ;

TITLE 'TTEST OF H0: MEAN=0.54';

**run**;**quit**;

**First life cycle-treatment and rep effect on wing and sex**

**data** a;

input treatment$ rep wing sex;

cards;

control 1 5.1 0

control 2 4.9 1

control 3 4.5 0

control 4 4.7 0

control 5 5.1 1

control 6 4.9 0

control 7 4.8 1

control 8 4.8 1

control 9 4.2 1

control 10 4.9 0

control 11 4.5 1

dicamba 1 4.5 1

dicamba 2 5.1 0

dicamba 3 4.9 1

dicamba 4 5.2 1

dicamba 5 5.3 0

dicamba 6 4.9 0

dicamba 7 4.5 1

;

**proc** **mixed** data=a;

title "two factor factorial experiment-Fwing&sex";

class rep treatment;

model wing = rep treatment;

lsmeans treatment / pdiff;

**run**;**quit**;**proc** **mixed** data=a;

title "two factor factorial experiment-Fwing&sex";

class rep treatment;

model sex = rep treatment;

lsmeans treatment / pdiff;

**run**;**quit**;

**proc** **mixed** data=a;

title "two factor factorial experiment-Fwing&sex";

class rep treatment sex;

model wing = rep treatment sex treatment\*sex;

lsmeans treatment sex / pdiff;

**run**;**quit**;

**data** a;

input treatment$ rep wing sex;

cards;

control 1 5.1 0

control 2 4.9 1

control 3 4.5 0

control 4 4.7 0

control 5 5.1 1

control 6 4.9 0

control 7 4.8 1

control 8 4.8 1

control 9 4.2 1

control 10 4.9 0

control 11 4.5 1

dicamba 1 4.5 1

dicamba 2 5.1 0

dicamba 3 4.9 1

dicamba 4 5.2 1

dicamba 5 5.3 0

dicamba 6 4.9 0

dicamba 7 4.5 1

;

**proc** **glm** data=a;

title "two factor factorial experiment-Fwing&sex";

class treatment rep sex;

model wing = sex rep ;

lsmeans treatment ;

**run**;**quit**;

**data** b;

input treatment$ rep wing sex;

cards;

control 1 5.1 0

control 2 4.9 1

control 3 4.5 0

control 4 4.7 0

control 5 5.1 1

control 6 4.9 0

control 7 4.8 1

control 8 4.8 1

control 9 4.2 1

control 10 4.9 0

control 11 4.5 1

dicamba 1 4.5 1

dicamba 2 5.1 0

dicamba 3 4.9 1

dicamba 4 5.2 1

dicamba 5 5.3 0

dicamba 6 4.9 0

dicamba 7 4.5 1

**proc** **glm** data=b;

title "two factor factorial experiment-Fwing&sex";

class treatment rep sex;

model wing = treatment rep sex sex\*treatment;

lsmeans treatment;

**run**;**quit**;

////////////////////////////////////////////////////////////////

**data** a;

input treatment$ rep wing sex;

cards;

control 1 5.1 0

control 2 4.9 1

control 3 4.5 0

control 4 4.7 0

control 5 5.1 1

control 6 4.9 0

control 7 4.8 1

control 8 4.8 1

control 9 4.2 1

control 10 4.9 0

control 11 4.5 1

dicamba 1 4.5 1

dicamba 2 5.1 0

dicamba 3 4.9 1

dicamba 4 5.2 1

dicamba 5 5.3 0

dicamba 6 4.9 0

dicamba 7 4.5 1

;

**proc** **mixed** data=a;

title "two factor factorial experiment-Fwing&sex";

class rep treatment;

model wing = rep treatment;

lsmeans treatment / pdiff;

**run**;**quit**;**proc** **mixed** data=a;

title "two factor factorial experiment-Fwing&sex";

class rep treatment;

model sex = rep treatment;

lsmeans treatment / pdiff;

**run**;**quit**;

\* try GLIMMIX for sex ratio with binomial distribution;

**proc** **mixed** data=a;

title "two factor factorial experiment-Fwing&sex";

class rep treatment sex;

model wing = rep treatment sex treatment\*sex;

lsmeans treatment sex / pdiff;

**run**;**quit**;

/////////////////////////////////////////////////

**2019 eggs**

**proc** **ttest** data=count sides=**2** alpha=**0.05** h0=**0**;

title "Two sample t-test";

class treat;

var eggs wk1 wk2 wk3 wk4 wk5 wk6 wk8 wk9 wk10 wk11;

**run**;**quit**;

**proc** **glm** data=bodywt;

title "two factor factorial experiment";

class treat position rep;

model weight= treat position rep treat\*position;

**run**;**quit**;

**proc** **glm** data=bodywt;

title "two factor factorial experiment";

class treat position rep;

model diet= treat position rep treat\*position;

**run**;**quit**;

**proc** **glm** data=Weight;

title "two factor factorial experiment";

class treat position rep;

model diet= treat position rep treat\*position;

lsmeans treat / cl adjust=tukey;

**run**;**quit**;

**proc** **glm** data=Weight;

title "two factor factorial experiment";

class treat position rep;

model weight= treat position rep treat\*position;

lsmeans treat / cl adjust=tukey;

**run**;**quit**;