**Data** corncarryover;

Infile 'C:\Users\Smith\Desktop\Thesis\Carryover\Data\Corn\Corn carryover SAS.csv' Firstobs=**2** dlm=',' lrecl=**40960**;

Input year block trt oatinjury ryeinjury crimsoninjury bruiserinjury radishinjury kinginjury oatdrywt ryedrywt crimsondrywt bruiserdrywt radishdrywt kingdrywt oatndvi ryendvi crimsonndvi bruiserndvi radishndvi kingndvi oatcover ryecover crimsoncover bruisercover radishcover kingcover ryespringndvi ryespringdrywt ryespringcover;

**PROC** **PRINT** DATA= corncarryover;

**RUN**;

**Data** corncarryover2;

set corncarryover;

logoatdrywt=log(oatdrywt);

Run;

**Data** corncarryover2014;

set corncarryover2;

if year = '2';

Run;

**proc** **mixed** data= corncarryover2014;

class block trt;

model logoatdrywt = trt/outp=oatdrywt2014;

random block;

lsmeans trt /pdiff adj=tukey;

**RUN**;

**Proc** **univariate** normal plot data=oatdrywt2014;

var resid;

**Run**;

**Proc** **plot** data = oatdrywt2014;

plot resid \* pred / vref=**0**;

**Run**; **Quit**;

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| The SAS System |

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| --- |
| Plot of Resid\*Pred. Legend: A = 1 obs, B = 2 obs, etc.    ‚  ‚  2.5 ˆ  ‚  ‚ A  ‚  ‚ A  2.0 ˆ  ‚  ‚  ‚ A  ‚  1.5 ˆ  ‚ A  ‚  ‚ A  ‚ A  1.0 ˆ  R ‚ A  e ‚ A  s ‚  i ‚ A  d 0.5 ˆ A A  u ‚ A A A  a ‚ A A  l ‚ A BA  ‚ A A  0.0 ˆƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒAƒƒƒƒAƒƒƒƒƒƒƒƒƒƒAƒAƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒAƒƒƒƒƒƒƒƒƒƒƒAƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ  ‚ A A A A A A  ‚ AA A A A  ‚ A A  ‚ A A  -0.5 ˆ A  ‚ A A  ‚ A A A A A A  ‚ A A A  ‚ A A A  -1.0 ˆ A  ‚ A  ‚  ‚  ‚  -1.5 ˆ  ‚  Šˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒ  0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25    Predicted |

|  |
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| The SAS System |

The Mixed Procedure

| **Model Information** | |
| --- | --- |
| **Data Set** | WORK.CORNCARRYOVER2014 |
| **Dependent Variable** | oatdrywt |
| **Covariance Structure** | Variance Components |
| **Estimation Method** | REML |
| **Residual Variance Method** | Profile |
| **Fixed Effects SE Method** | Model-Based |
| **Degrees of Freedom Method** | Containment |

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **block** | 4 | 1 2 3 4 |
| **trt** | 15 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 |

| **Dimensions** | |
| --- | --- |
| **Covariance Parameters** | 2 |
| **Columns in X** | 16 |
| **Columns in Z** | 4 |
| **Subjects** | 1 |
| **Max Obs Per Subject** | 60 |

| **Number of Observations** | |
| --- | --- |
| **Number of Observations Read** | 60 |
| **Number of Observations Used** | 60 |
| **Number of Observations Not Used** | 0 |

| **Iteration History** | | | |
| --- | --- | --- | --- |
| **Iteration** | **Evaluations** | **-2 Res Log Like** | **Criterion** |
| **0** | 1 | 143.52721001 |  |
| **1** | 1 | 138.89904737 | 0.00000000 |

|  |
| --- |
| Convergence criteria met. |

| **Covariance Parameter Estimates** | |
| --- | --- |
| **Cov Parm** | **Estimate** |
| **block** | 0.1627 |
| **Residual** | 0.7327 |

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 138.9 |
| **AIC (smaller is better)** | 142.9 |
| **AICC (smaller is better)** | 143.2 |
| **BIC (smaller is better)** | 141.7 |

| **Type 3 Tests of Fixed Effects** | | | | |
| --- | --- | --- | --- | --- |
| **Effect** | **Num DF** | **Den DF** | **F Value** | **Pr > F** |
| **trt** | 14 | 42 | 0.46 | 0.9405 |

| **Least Squares Means** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Effect** | **trt** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **trt** | **1** | 1.3450 | 0.4731 | 42 | 2.84 | 0.0069 |
| **trt** | **2** | 1.4850 | 0.4731 | 42 | 3.14 | 0.0031 |
| **trt** | **3** | 0.8875 | 0.4731 | 42 | 1.88 | 0.0676 |
| **trt** | **4** | 1.6850 | 0.4731 | 42 | 3.56 | 0.0009 |
| **trt** | **5** | 1.6250 | 0.4731 | 42 | 3.43 | 0.0013 |
| **trt** | **6** | 1.8975 | 0.4731 | 42 | 4.01 | 0.0002 |
| **trt** | **7** | 1.1925 | 0.4731 | 42 | 2.52 | 0.0156 |
| **trt** | **8** | 1.6525 | 0.4731 | 42 | 3.49 | 0.0011 |
| **trt** | **9** | 1.5975 | 0.4731 | 42 | 3.38 | 0.0016 |
| **trt** | **10** | 1.1900 | 0.4731 | 42 | 2.52 | 0.0158 |
| **trt** | **11** | 0.9850 | 0.4731 | 42 | 2.08 | 0.0435 |
| **trt** | **12** | 1.4850 | 0.4731 | 42 | 3.14 | 0.0031 |
| **trt** | **13** | 1.0275 | 0.4731 | 42 | 2.17 | 0.0356 |
| **trt** | **14** | 1.4300 | 0.4731 | 42 | 3.02 | 0.0043 |
| **trt** | **15** | 1.2275 | 0.4731 | 42 | 2.59 | 0.0130 |

| **Differences of Least Squares Means** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Effect** | **trt** | **\_trt** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** | **Adjustment** | **Adj P** |
| **trt** | **1** | **2** | -0.1400 | 0.6053 | 42 | -0.23 | 0.8182 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **3** | 0.4575 | 0.6053 | 42 | 0.76 | 0.4539 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **4** | -0.3400 | 0.6053 | 42 | -0.56 | 0.5773 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **5** | -0.2800 | 0.6053 | 42 | -0.46 | 0.6460 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **6** | -0.5525 | 0.6053 | 42 | -0.91 | 0.3665 | Tukey-Kramer | 0.9998 |
| **trt** | **1** | **7** | 0.1525 | 0.6053 | 42 | 0.25 | 0.8023 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **8** | -0.3075 | 0.6053 | 42 | -0.51 | 0.6141 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **9** | -0.2525 | 0.6053 | 42 | -0.42 | 0.6787 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **10** | 0.1550 | 0.6053 | 42 | 0.26 | 0.7991 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **11** | 0.3600 | 0.6053 | 42 | 0.59 | 0.5552 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **12** | -0.1400 | 0.6053 | 42 | -0.23 | 0.8182 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **13** | 0.3175 | 0.6053 | 42 | 0.52 | 0.6026 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **14** | -0.08500 | 0.6053 | 42 | -0.14 | 0.8890 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **15** | 0.1175 | 0.6053 | 42 | 0.19 | 0.8470 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **3** | 0.5975 | 0.6053 | 42 | 0.99 | 0.3292 | Tukey-Kramer | 0.9995 |
| **trt** | **2** | **4** | -0.2000 | 0.6053 | 42 | -0.33 | 0.7427 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **5** | -0.1400 | 0.6053 | 42 | -0.23 | 0.8182 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **6** | -0.4125 | 0.6053 | 42 | -0.68 | 0.4993 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **7** | 0.2925 | 0.6053 | 42 | 0.48 | 0.6314 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **8** | -0.1675 | 0.6053 | 42 | -0.28 | 0.7833 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **9** | -0.1125 | 0.6053 | 42 | -0.19 | 0.8534 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **10** | 0.2950 | 0.6053 | 42 | 0.49 | 0.6285 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **11** | 0.5000 | 0.6053 | 42 | 0.83 | 0.4134 | Tukey-Kramer | 0.9999 |
| **trt** | **2** | **12** | 3.33E-16 | 0.6053 | 42 | 0.00 | 1.0000 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **13** | 0.4575 | 0.6053 | 42 | 0.76 | 0.4539 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **14** | 0.05500 | 0.6053 | 42 | 0.09 | 0.9280 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **15** | 0.2575 | 0.6053 | 42 | 0.43 | 0.6727 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **4** | -0.7975 | 0.6053 | 42 | -1.32 | 0.1948 | Tukey-Kramer | 0.9900 |
| **trt** | **3** | **5** | -0.7375 | 0.6053 | 42 | -1.22 | 0.2298 | Tukey-Kramer | 0.9952 |
| **trt** | **3** | **6** | -1.0100 | 0.6053 | 42 | -1.67 | 0.1026 | Tukey-Kramer | 0.9310 |
| **trt** | **3** | **7** | -0.3050 | 0.6053 | 42 | -0.50 | 0.6170 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **8** | -0.7650 | 0.6053 | 42 | -1.26 | 0.2132 | Tukey-Kramer | 0.9932 |
| **trt** | **3** | **9** | -0.7100 | 0.6053 | 42 | -1.17 | 0.2474 | Tukey-Kramer | 0.9967 |
| **trt** | **3** | **10** | -0.3025 | 0.6053 | 42 | -0.50 | 0.6198 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **11** | -0.09750 | 0.6053 | 42 | -0.16 | 0.8728 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **12** | -0.5975 | 0.6053 | 42 | -0.99 | 0.3292 | Tukey-Kramer | 0.9995 |
| **trt** | **3** | **13** | -0.1400 | 0.6053 | 42 | -0.23 | 0.8182 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **14** | -0.5425 | 0.6053 | 42 | -0.90 | 0.3752 | Tukey-Kramer | 0.9998 |
| **trt** | **3** | **15** | -0.3400 | 0.6053 | 42 | -0.56 | 0.5773 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **5** | 0.06000 | 0.6053 | 42 | 0.10 | 0.9215 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **6** | -0.2125 | 0.6053 | 42 | -0.35 | 0.7273 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **7** | 0.4925 | 0.6053 | 42 | 0.81 | 0.4204 | Tukey-Kramer | 0.9999 |
| **trt** | **4** | **8** | 0.03250 | 0.6053 | 42 | 0.05 | 0.9574 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **9** | 0.08750 | 0.6053 | 42 | 0.14 | 0.8857 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **10** | 0.4950 | 0.6053 | 42 | 0.82 | 0.4181 | Tukey-Kramer | 0.9999 |
| **trt** | **4** | **11** | 0.7000 | 0.6053 | 42 | 1.16 | 0.2540 | Tukey-Kramer | 0.9972 |
| **trt** | **4** | **12** | 0.2000 | 0.6053 | 42 | 0.33 | 0.7427 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **13** | 0.6575 | 0.6053 | 42 | 1.09 | 0.2835 | Tukey-Kramer | 0.9985 |
| **trt** | **4** | **14** | 0.2550 | 0.6053 | 42 | 0.42 | 0.6757 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **15** | 0.4575 | 0.6053 | 42 | 0.76 | 0.4539 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **6** | -0.2725 | 0.6053 | 42 | -0.45 | 0.6549 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **7** | 0.4325 | 0.6053 | 42 | 0.71 | 0.4788 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **8** | -0.02750 | 0.6053 | 42 | -0.05 | 0.9640 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **9** | 0.02750 | 0.6053 | 42 | 0.05 | 0.9640 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **10** | 0.4350 | 0.6053 | 42 | 0.72 | 0.4763 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **11** | 0.6400 | 0.6053 | 42 | 1.06 | 0.2964 | Tukey-Kramer | 0.9989 |
| **trt** | **5** | **12** | 0.1400 | 0.6053 | 42 | 0.23 | 0.8182 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **13** | 0.5975 | 0.6053 | 42 | 0.99 | 0.3292 | Tukey-Kramer | 0.9995 |
| **trt** | **5** | **14** | 0.1950 | 0.6053 | 42 | 0.32 | 0.7489 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **15** | 0.3975 | 0.6053 | 42 | 0.66 | 0.5149 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **7** | 0.7050 | 0.6053 | 42 | 1.16 | 0.2507 | Tukey-Kramer | 0.9969 |
| **trt** | **6** | **8** | 0.2450 | 0.6053 | 42 | 0.40 | 0.6877 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **9** | 0.3000 | 0.6053 | 42 | 0.50 | 0.6227 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **10** | 0.7075 | 0.6053 | 42 | 1.17 | 0.2490 | Tukey-Kramer | 0.9968 |
| **trt** | **6** | **11** | 0.9125 | 0.6053 | 42 | 1.51 | 0.1391 | Tukey-Kramer | 0.9681 |
| **trt** | **6** | **12** | 0.4125 | 0.6053 | 42 | 0.68 | 0.4993 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **13** | 0.8700 | 0.6053 | 42 | 1.44 | 0.1580 | Tukey-Kramer | 0.9785 |
| **trt** | **6** | **14** | 0.4675 | 0.6053 | 42 | 0.77 | 0.4442 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **15** | 0.6700 | 0.6053 | 42 | 1.11 | 0.2746 | Tukey-Kramer | 0.9982 |
| **trt** | **7** | **8** | -0.4600 | 0.6053 | 42 | -0.76 | 0.4515 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **9** | -0.4050 | 0.6053 | 42 | -0.67 | 0.5071 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **10** | 0.002500 | 0.6053 | 42 | 0.00 | 0.9967 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **11** | 0.2075 | 0.6053 | 42 | 0.34 | 0.7334 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **12** | -0.2925 | 0.6053 | 42 | -0.48 | 0.6314 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **13** | 0.1650 | 0.6053 | 42 | 0.27 | 0.7865 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **14** | -0.2375 | 0.6053 | 42 | -0.39 | 0.6968 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **15** | -0.03500 | 0.6053 | 42 | -0.06 | 0.9542 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **9** | 0.05500 | 0.6053 | 42 | 0.09 | 0.9280 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **10** | 0.4625 | 0.6053 | 42 | 0.76 | 0.4491 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **11** | 0.6675 | 0.6053 | 42 | 1.10 | 0.2764 | Tukey-Kramer | 0.9982 |
| **trt** | **8** | **12** | 0.1675 | 0.6053 | 42 | 0.28 | 0.7833 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **13** | 0.6250 | 0.6053 | 42 | 1.03 | 0.3077 | Tukey-Kramer | 0.9991 |
| **trt** | **8** | **14** | 0.2225 | 0.6053 | 42 | 0.37 | 0.7150 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **15** | 0.4250 | 0.6053 | 42 | 0.70 | 0.4864 | Tukey-Kramer | 1.0000 |
| **trt** | **9** | **10** | 0.4075 | 0.6053 | 42 | 0.67 | 0.5045 | Tukey-Kramer | 1.0000 |
| **trt** | **9** | **11** | 0.6125 | 0.6053 | 42 | 1.01 | 0.3173 | Tukey-Kramer | 0.9993 |
| **trt** | **9** | **12** | 0.1125 | 0.6053 | 42 | 0.19 | 0.8534 | Tukey-Kramer | 1.0000 |
| **trt** | **9** | **13** | 0.5700 | 0.6053 | 42 | 0.94 | 0.3517 | Tukey-Kramer | 0.9997 |
| **trt** | **9** | **14** | 0.1675 | 0.6053 | 42 | 0.28 | 0.7833 | Tukey-Kramer | 1.0000 |
| **trt** | **9** | **15** | 0.3700 | 0.6053 | 42 | 0.61 | 0.5443 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **11** | 0.2050 | 0.6053 | 42 | 0.34 | 0.7365 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **12** | -0.2950 | 0.6053 | 42 | -0.49 | 0.6285 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **13** | 0.1625 | 0.6053 | 42 | 0.27 | 0.7896 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **14** | -0.2400 | 0.6053 | 42 | -0.40 | 0.6937 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **15** | -0.03750 | 0.6053 | 42 | -0.06 | 0.9509 | Tukey-Kramer | 1.0000 |
| **trt** | **11** | **12** | -0.5000 | 0.6053 | 42 | -0.83 | 0.4134 | Tukey-Kramer | 0.9999 |
| **trt** | **11** | **13** | -0.04250 | 0.6053 | 42 | -0.07 | 0.9444 | Tukey-Kramer | 1.0000 |
| **trt** | **11** | **14** | -0.4450 | 0.6053 | 42 | -0.74 | 0.4663 | Tukey-Kramer | 1.0000 |
| **trt** | **11** | **15** | -0.2425 | 0.6053 | 42 | -0.40 | 0.6907 | Tukey-Kramer | 1.0000 |
| **trt** | **12** | **13** | 0.4575 | 0.6053 | 42 | 0.76 | 0.4539 | Tukey-Kramer | 1.0000 |
| **trt** | **12** | **14** | 0.05500 | 0.6053 | 42 | 0.09 | 0.9280 | Tukey-Kramer | 1.0000 |
| **trt** | **12** | **15** | 0.2575 | 0.6053 | 42 | 0.43 | 0.6727 | Tukey-Kramer | 1.0000 |
| **trt** | **13** | **14** | -0.4025 | 0.6053 | 42 | -0.67 | 0.5097 | Tukey-Kramer | 1.0000 |
| **trt** | **13** | **15** | -0.2000 | 0.6053 | 42 | -0.33 | 0.7427 | Tukey-Kramer | 1.0000 |
| **trt** | **14** | **15** | 0.2025 | 0.6053 | 42 | 0.33 | 0.7396 | Tukey-Kramer | 1.0000 |

|  |
| --- |
| The SAS System |

The UNIVARIATE Procedure

Variable: Resid (Residual)

| **Moments** | | | |
| --- | --- | --- | --- |
| **N** | 60 | **Sum Weights** | 60 |
| **Mean** | 0 | **Sum Observations** | 0 |
| **Std Deviation** | 0.72812265 | **Variance** | 0.5301626 |
| **Skewness** | 1.1605654 | **Kurtosis** | 1.61861197 |
| **Uncorrected SS** | 31.2795933 | **Corrected SS** | 31.2795933 |
| **Coeff Variation** | . | **Std Error Mean** | 0.09400023 |

| **Basic Statistical Measures** | | | |
| --- | --- | --- | --- |
| **Location** | | **Variability** | |
| **Mean** | 0.00000 | **Std Deviation** | 0.72812 |
| **Median** | -0.10381 | **Variance** | 0.53016 |
| **Mode** | . | **Range** | 3.45000 |
|  |  | **Interquartile Range** | 0.85499 |

| **Tests for Location: Mu0=0** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Student's t** | **t** | 0 | **Pr > |t|** | 1.0000 |
| **Sign** | **M** | -4 | **Pr >= |M|** | 0.3663 |
| **Signed Rank** | **S** | -105 | **Pr >= |S|** | 0.4442 |

| **Tests for Normality** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Shapiro-Wilk** | **W** | 0.91703 | **Pr < W** | 0.0006 |
| **Kolmogorov-Smirnov** | **D** | 0.118725 | **Pr > D** | 0.0348 |
| **Cramer-von Mises** | **W-Sq** | 0.185364 | **Pr > W-Sq** | 0.0081 |
| **Anderson-Darling** | **A-Sq** | 1.272549 | **Pr > A-Sq** | <0.0050 |

| **Quantiles (Definition 5)** | |
| --- | --- |
| **Quantile** | **Estimate** |
| **100% Max** | 2.328217 |
| **99%** | 2.328217 |
| **95%** | 1.535819 |
| **90%** | 1.007455 |
| **75% Q3** | 0.299943 |
| **50% Median** | -0.103807 |
| **25% Q1** | -0.555045 |
| **10%** | -0.762455 |
| **5%** | -0.883807 |
| **1%** | -1.121783 |
| **0% Min** | -1.121783 |

| **Extreme Observations** | | | |
| --- | --- | --- | --- |
| **Lowest** | | **Highest** | |
| **Value** | **Obs** | **Value** | **Obs** |
| -1.121783 | 1 | 1.17592 | 20 |
| -0.964078 | 4 | 1.40822 | 5 |
| -0.900831 | 46 | 1.66342 | 24 |
| -0.866783 | 37 | 2.07669 | 3 |
| -0.865808 | 35 | 2.32822 | 45 |

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| The SAS System |

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| --- |
| Plot of Resid\*Pred. Legend: A = 1 obs, B = 2 obs, etc.    ‚  ‚  2.5 ˆ  ‚  ‚ A  ‚  ‚ A  2.0 ˆ  ‚  ‚  ‚ A  ‚  1.5 ˆ  ‚ A  ‚  ‚ A  ‚ A  1.0 ˆ  R ‚ A  e ‚ A  s ‚  i ‚ A  d 0.5 ˆ A A  u ‚ A A A  a ‚ A A  l ‚ A BA  ‚ A A  0.0 ˆƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒAƒƒƒƒAƒƒƒƒƒƒƒƒƒƒAƒAƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒAƒƒƒƒƒƒƒƒƒƒƒAƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ  ‚ A A A A A A  ‚ AA A A A  ‚ A A  ‚ A A  -0.5 ˆ A  ‚ A A  ‚ A A A A A A  ‚ A A A  ‚ A A A  -1.0 ˆ A  ‚ A  ‚  ‚  ‚  -1.5 ˆ  ‚  Šˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒ  0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25    Predicted |

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| The SAS System |

The UNIVARIATE Procedure

Variable: Resid (Residual)

| **Moments** | | | |
| --- | --- | --- | --- |
| **N** | 60 | **Sum Weights** | 60 |
| **Mean** | 0 | **Sum Observations** | 0 |
| **Std Deviation** | 0.72812265 | **Variance** | 0.5301626 |
| **Skewness** | 1.1605654 | **Kurtosis** | 1.61861197 |
| **Uncorrected SS** | 31.2795933 | **Corrected SS** | 31.2795933 |
| **Coeff Variation** | . | **Std Error Mean** | 0.09400023 |

| **Basic Statistical Measures** | | | |
| --- | --- | --- | --- |
| **Location** | | **Variability** | |
| **Mean** | 0.00000 | **Std Deviation** | 0.72812 |
| **Median** | -0.10381 | **Variance** | 0.53016 |
| **Mode** | . | **Range** | 3.45000 |
|  |  | **Interquartile Range** | 0.85499 |

| **Tests for Location: Mu0=0** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Student's t** | **t** | 0 | **Pr > |t|** | 1.0000 |
| **Sign** | **M** | -4 | **Pr >= |M|** | 0.3663 |
| **Signed Rank** | **S** | -105 | **Pr >= |S|** | 0.4442 |

| **Tests for Normality** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Shapiro-Wilk** | **W** | 0.91703 | **Pr < W** | 0.0006 |
| **Kolmogorov-Smirnov** | **D** | 0.118725 | **Pr > D** | 0.0348 |
| **Cramer-von Mises** | **W-Sq** | 0.185364 | **Pr > W-Sq** | 0.0081 |
| **Anderson-Darling** | **A-Sq** | 1.272549 | **Pr > A-Sq** | <0.0050 |

| **Quantiles (Definition 5)** | |
| --- | --- |
| **Quantile** | **Estimate** |
| **100% Max** | 2.328217 |
| **99%** | 2.328217 |
| **95%** | 1.535819 |
| **90%** | 1.007455 |
| **75% Q3** | 0.299943 |
| **50% Median** | -0.103807 |
| **25% Q1** | -0.555045 |
| **10%** | -0.762455 |
| **5%** | -0.883807 |
| **1%** | -1.121783 |
| **0% Min** | -1.121783 |

| **Extreme Observations** | | | |
| --- | --- | --- | --- |
| **Lowest** | | **Highest** | |
| **Value** | **Obs** | **Value** | **Obs** |
| -1.121783 | 1 | 1.17592 | 20 |
| -0.964078 | 4 | 1.40822 | 5 |
| -0.900831 | 46 | 1.66342 | 24 |
| -0.866783 | 37 | 2.07669 | 3 |
| -0.865808 | 35 | 2.32822 | 45 |

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| The SAS System |

The Mixed Procedure

| **Model Information** | |
| --- | --- |
| **Data Set** | WORK.CORNCARRYOVER2014 |
| **Dependent Variable** | oatdrywt |
| **Covariance Structure** | Variance Components |
| **Estimation Method** | REML |
| **Residual Variance Method** | Profile |
| **Fixed Effects SE Method** | Model-Based |
| **Degrees of Freedom Method** | Containment |

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **block** | 4 | 1 2 3 4 |
| **trt** | 15 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 |

| **Dimensions** | |
| --- | --- |
| **Covariance Parameters** | 2 |
| **Columns in X** | 16 |
| **Columns in Z** | 4 |
| **Subjects** | 1 |
| **Max Obs Per Subject** | 60 |

| **Number of Observations** | |
| --- | --- |
| **Number of Observations Read** | 60 |
| **Number of Observations Used** | 60 |
| **Number of Observations Not Used** | 0 |

| **Iteration History** | | | |
| --- | --- | --- | --- |
| **Iteration** | **Evaluations** | **-2 Res Log Like** | **Criterion** |
| **0** | 1 | 143.52721001 |  |
| **1** | 1 | 138.89904737 | 0.00000000 |

|  |
| --- |
| Convergence criteria met. |

| **Covariance Parameter Estimates** | |
| --- | --- |
| **Cov Parm** | **Estimate** |
| **block** | 0.1627 |
| **Residual** | 0.7327 |

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 138.9 |
| **AIC (smaller is better)** | 142.9 |
| **AICC (smaller is better)** | 143.2 |
| **BIC (smaller is better)** | 141.7 |

| **Type 3 Tests of Fixed Effects** | | | | |
| --- | --- | --- | --- | --- |
| **Effect** | **Num DF** | **Den DF** | **F Value** | **Pr > F** |
| **trt** | 14 | 42 | 0.46 | 0.9405 |

| **Least Squares Means** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Effect** | **trt** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **trt** | **1** | 1.3450 | 0.4731 | 42 | 2.84 | 0.0069 |
| **trt** | **2** | 1.4850 | 0.4731 | 42 | 3.14 | 0.0031 |
| **trt** | **3** | 0.8875 | 0.4731 | 42 | 1.88 | 0.0676 |
| **trt** | **4** | 1.6850 | 0.4731 | 42 | 3.56 | 0.0009 |
| **trt** | **5** | 1.6250 | 0.4731 | 42 | 3.43 | 0.0013 |
| **trt** | **6** | 1.8975 | 0.4731 | 42 | 4.01 | 0.0002 |
| **trt** | **7** | 1.1925 | 0.4731 | 42 | 2.52 | 0.0156 |
| **trt** | **8** | 1.6525 | 0.4731 | 42 | 3.49 | 0.0011 |
| **trt** | **9** | 1.5975 | 0.4731 | 42 | 3.38 | 0.0016 |
| **trt** | **10** | 1.1900 | 0.4731 | 42 | 2.52 | 0.0158 |
| **trt** | **11** | 0.9850 | 0.4731 | 42 | 2.08 | 0.0435 |
| **trt** | **12** | 1.4850 | 0.4731 | 42 | 3.14 | 0.0031 |
| **trt** | **13** | 1.0275 | 0.4731 | 42 | 2.17 | 0.0356 |
| **trt** | **14** | 1.4300 | 0.4731 | 42 | 3.02 | 0.0043 |
| **trt** | **15** | 1.2275 | 0.4731 | 42 | 2.59 | 0.0130 |

| **Differences of Least Squares Means** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Effect** | **trt** | **\_trt** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** | **Adjustment** | **Adj P** |
| **trt** | **1** | **2** | -0.1400 | 0.6053 | 42 | -0.23 | 0.8182 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **3** | 0.4575 | 0.6053 | 42 | 0.76 | 0.4539 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **4** | -0.3400 | 0.6053 | 42 | -0.56 | 0.5773 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **5** | -0.2800 | 0.6053 | 42 | -0.46 | 0.6460 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **6** | -0.5525 | 0.6053 | 42 | -0.91 | 0.3665 | Tukey-Kramer | 0.9998 |
| **trt** | **1** | **7** | 0.1525 | 0.6053 | 42 | 0.25 | 0.8023 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **8** | -0.3075 | 0.6053 | 42 | -0.51 | 0.6141 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **9** | -0.2525 | 0.6053 | 42 | -0.42 | 0.6787 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **10** | 0.1550 | 0.6053 | 42 | 0.26 | 0.7991 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **11** | 0.3600 | 0.6053 | 42 | 0.59 | 0.5552 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **12** | -0.1400 | 0.6053 | 42 | -0.23 | 0.8182 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **13** | 0.3175 | 0.6053 | 42 | 0.52 | 0.6026 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **14** | -0.08500 | 0.6053 | 42 | -0.14 | 0.8890 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **15** | 0.1175 | 0.6053 | 42 | 0.19 | 0.8470 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **3** | 0.5975 | 0.6053 | 42 | 0.99 | 0.3292 | Tukey-Kramer | 0.9995 |
| **trt** | **2** | **4** | -0.2000 | 0.6053 | 42 | -0.33 | 0.7427 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **5** | -0.1400 | 0.6053 | 42 | -0.23 | 0.8182 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **6** | -0.4125 | 0.6053 | 42 | -0.68 | 0.4993 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **7** | 0.2925 | 0.6053 | 42 | 0.48 | 0.6314 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **8** | -0.1675 | 0.6053 | 42 | -0.28 | 0.7833 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **9** | -0.1125 | 0.6053 | 42 | -0.19 | 0.8534 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **10** | 0.2950 | 0.6053 | 42 | 0.49 | 0.6285 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **11** | 0.5000 | 0.6053 | 42 | 0.83 | 0.4134 | Tukey-Kramer | 0.9999 |
| **trt** | **2** | **12** | 3.33E-16 | 0.6053 | 42 | 0.00 | 1.0000 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **13** | 0.4575 | 0.6053 | 42 | 0.76 | 0.4539 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **14** | 0.05500 | 0.6053 | 42 | 0.09 | 0.9280 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **15** | 0.2575 | 0.6053 | 42 | 0.43 | 0.6727 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **4** | -0.7975 | 0.6053 | 42 | -1.32 | 0.1948 | Tukey-Kramer | 0.9900 |
| **trt** | **3** | **5** | -0.7375 | 0.6053 | 42 | -1.22 | 0.2298 | Tukey-Kramer | 0.9952 |
| **trt** | **3** | **6** | -1.0100 | 0.6053 | 42 | -1.67 | 0.1026 | Tukey-Kramer | 0.9310 |
| **trt** | **3** | **7** | -0.3050 | 0.6053 | 42 | -0.50 | 0.6170 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **8** | -0.7650 | 0.6053 | 42 | -1.26 | 0.2132 | Tukey-Kramer | 0.9932 |
| **trt** | **3** | **9** | -0.7100 | 0.6053 | 42 | -1.17 | 0.2474 | Tukey-Kramer | 0.9967 |
| **trt** | **3** | **10** | -0.3025 | 0.6053 | 42 | -0.50 | 0.6198 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **11** | -0.09750 | 0.6053 | 42 | -0.16 | 0.8728 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **12** | -0.5975 | 0.6053 | 42 | -0.99 | 0.3292 | Tukey-Kramer | 0.9995 |
| **trt** | **3** | **13** | -0.1400 | 0.6053 | 42 | -0.23 | 0.8182 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **14** | -0.5425 | 0.6053 | 42 | -0.90 | 0.3752 | Tukey-Kramer | 0.9998 |
| **trt** | **3** | **15** | -0.3400 | 0.6053 | 42 | -0.56 | 0.5773 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **5** | 0.06000 | 0.6053 | 42 | 0.10 | 0.9215 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **6** | -0.2125 | 0.6053 | 42 | -0.35 | 0.7273 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **7** | 0.4925 | 0.6053 | 42 | 0.81 | 0.4204 | Tukey-Kramer | 0.9999 |
| **trt** | **4** | **8** | 0.03250 | 0.6053 | 42 | 0.05 | 0.9574 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **9** | 0.08750 | 0.6053 | 42 | 0.14 | 0.8857 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **10** | 0.4950 | 0.6053 | 42 | 0.82 | 0.4181 | Tukey-Kramer | 0.9999 |
| **trt** | **4** | **11** | 0.7000 | 0.6053 | 42 | 1.16 | 0.2540 | Tukey-Kramer | 0.9972 |
| **trt** | **4** | **12** | 0.2000 | 0.6053 | 42 | 0.33 | 0.7427 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **13** | 0.6575 | 0.6053 | 42 | 1.09 | 0.2835 | Tukey-Kramer | 0.9985 |
| **trt** | **4** | **14** | 0.2550 | 0.6053 | 42 | 0.42 | 0.6757 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **15** | 0.4575 | 0.6053 | 42 | 0.76 | 0.4539 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **6** | -0.2725 | 0.6053 | 42 | -0.45 | 0.6549 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **7** | 0.4325 | 0.6053 | 42 | 0.71 | 0.4788 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **8** | -0.02750 | 0.6053 | 42 | -0.05 | 0.9640 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **9** | 0.02750 | 0.6053 | 42 | 0.05 | 0.9640 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **10** | 0.4350 | 0.6053 | 42 | 0.72 | 0.4763 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **11** | 0.6400 | 0.6053 | 42 | 1.06 | 0.2964 | Tukey-Kramer | 0.9989 |
| **trt** | **5** | **12** | 0.1400 | 0.6053 | 42 | 0.23 | 0.8182 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **13** | 0.5975 | 0.6053 | 42 | 0.99 | 0.3292 | Tukey-Kramer | 0.9995 |
| **trt** | **5** | **14** | 0.1950 | 0.6053 | 42 | 0.32 | 0.7489 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **15** | 0.3975 | 0.6053 | 42 | 0.66 | 0.5149 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **7** | 0.7050 | 0.6053 | 42 | 1.16 | 0.2507 | Tukey-Kramer | 0.9969 |
| **trt** | **6** | **8** | 0.2450 | 0.6053 | 42 | 0.40 | 0.6877 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **9** | 0.3000 | 0.6053 | 42 | 0.50 | 0.6227 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **10** | 0.7075 | 0.6053 | 42 | 1.17 | 0.2490 | Tukey-Kramer | 0.9968 |
| **trt** | **6** | **11** | 0.9125 | 0.6053 | 42 | 1.51 | 0.1391 | Tukey-Kramer | 0.9681 |
| **trt** | **6** | **12** | 0.4125 | 0.6053 | 42 | 0.68 | 0.4993 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **13** | 0.8700 | 0.6053 | 42 | 1.44 | 0.1580 | Tukey-Kramer | 0.9785 |
| **trt** | **6** | **14** | 0.4675 | 0.6053 | 42 | 0.77 | 0.4442 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **15** | 0.6700 | 0.6053 | 42 | 1.11 | 0.2746 | Tukey-Kramer | 0.9982 |
| **trt** | **7** | **8** | -0.4600 | 0.6053 | 42 | -0.76 | 0.4515 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **9** | -0.4050 | 0.6053 | 42 | -0.67 | 0.5071 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **10** | 0.002500 | 0.6053 | 42 | 0.00 | 0.9967 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **11** | 0.2075 | 0.6053 | 42 | 0.34 | 0.7334 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **12** | -0.2925 | 0.6053 | 42 | -0.48 | 0.6314 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **13** | 0.1650 | 0.6053 | 42 | 0.27 | 0.7865 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **14** | -0.2375 | 0.6053 | 42 | -0.39 | 0.6968 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **15** | -0.03500 | 0.6053 | 42 | -0.06 | 0.9542 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **9** | 0.05500 | 0.6053 | 42 | 0.09 | 0.9280 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **10** | 0.4625 | 0.6053 | 42 | 0.76 | 0.4491 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **11** | 0.6675 | 0.6053 | 42 | 1.10 | 0.2764 | Tukey-Kramer | 0.9982 |
| **trt** | **8** | **12** | 0.1675 | 0.6053 | 42 | 0.28 | 0.7833 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **13** | 0.6250 | 0.6053 | 42 | 1.03 | 0.3077 | Tukey-Kramer | 0.9991 |
| **trt** | **8** | **14** | 0.2225 | 0.6053 | 42 | 0.37 | 0.7150 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **15** | 0.4250 | 0.6053 | 42 | 0.70 | 0.4864 | Tukey-Kramer | 1.0000 |
| **trt** | **9** | **10** | 0.4075 | 0.6053 | 42 | 0.67 | 0.5045 | Tukey-Kramer | 1.0000 |
| **trt** | **9** | **11** | 0.6125 | 0.6053 | 42 | 1.01 | 0.3173 | Tukey-Kramer | 0.9993 |
| **trt** | **9** | **12** | 0.1125 | 0.6053 | 42 | 0.19 | 0.8534 | Tukey-Kramer | 1.0000 |
| **trt** | **9** | **13** | 0.5700 | 0.6053 | 42 | 0.94 | 0.3517 | Tukey-Kramer | 0.9997 |
| **trt** | **9** | **14** | 0.1675 | 0.6053 | 42 | 0.28 | 0.7833 | Tukey-Kramer | 1.0000 |
| **trt** | **9** | **15** | 0.3700 | 0.6053 | 42 | 0.61 | 0.5443 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **11** | 0.2050 | 0.6053 | 42 | 0.34 | 0.7365 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **12** | -0.2950 | 0.6053 | 42 | -0.49 | 0.6285 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **13** | 0.1625 | 0.6053 | 42 | 0.27 | 0.7896 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **14** | -0.2400 | 0.6053 | 42 | -0.40 | 0.6937 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **15** | -0.03750 | 0.6053 | 42 | -0.06 | 0.9509 | Tukey-Kramer | 1.0000 |
| **trt** | **11** | **12** | -0.5000 | 0.6053 | 42 | -0.83 | 0.4134 | Tukey-Kramer | 0.9999 |
| **trt** | **11** | **13** | -0.04250 | 0.6053 | 42 | -0.07 | 0.9444 | Tukey-Kramer | 1.0000 |
| **trt** | **11** | **14** | -0.4450 | 0.6053 | 42 | -0.74 | 0.4663 | Tukey-Kramer | 1.0000 |
| **trt** | **11** | **15** | -0.2425 | 0.6053 | 42 | -0.40 | 0.6907 | Tukey-Kramer | 1.0000 |
| **trt** | **12** | **13** | 0.4575 | 0.6053 | 42 | 0.76 | 0.4539 | Tukey-Kramer | 1.0000 |
| **trt** | **12** | **14** | 0.05500 | 0.6053 | 42 | 0.09 | 0.9280 | Tukey-Kramer | 1.0000 |
| **trt** | **12** | **15** | 0.2575 | 0.6053 | 42 | 0.43 | 0.6727 | Tukey-Kramer | 1.0000 |
| **trt** | **13** | **14** | -0.4025 | 0.6053 | 42 | -0.67 | 0.5097 | Tukey-Kramer | 1.0000 |
| **trt** | **13** | **15** | -0.2000 | 0.6053 | 42 | -0.33 | 0.7427 | Tukey-Kramer | 1.0000 |
| **trt** | **14** | **15** | 0.2025 | 0.6053 | 42 | 0.33 | 0.7396 | Tukey-Kramer | 1.0000 |

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| The SAS System |

The UNIVARIATE Procedure

Variable: Resid (Residual)

| **Moments** | | | |
| --- | --- | --- | --- |
| **N** | 60 | **Sum Weights** | 60 |
| **Mean** | 0 | **Sum Observations** | 0 |
| **Std Deviation** | 0.72812265 | **Variance** | 0.5301626 |
| **Skewness** | 1.1605654 | **Kurtosis** | 1.61861197 |
| **Uncorrected SS** | 31.2795933 | **Corrected SS** | 31.2795933 |
| **Coeff Variation** | . | **Std Error Mean** | 0.09400023 |

| **Basic Statistical Measures** | | | |
| --- | --- | --- | --- |
| **Location** | | **Variability** | |
| **Mean** | 0.00000 | **Std Deviation** | 0.72812 |
| **Median** | -0.10381 | **Variance** | 0.53016 |
| **Mode** | . | **Range** | 3.45000 |
|  |  | **Interquartile Range** | 0.85499 |

| **Tests for Location: Mu0=0** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Student's t** | **t** | 0 | **Pr > |t|** | 1.0000 |
| **Sign** | **M** | -4 | **Pr >= |M|** | 0.3663 |
| **Signed Rank** | **S** | -105 | **Pr >= |S|** | 0.4442 |

| **Tests for Normality** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Shapiro-Wilk** | **W** | 0.91703 | **Pr < W** | 0.0006 |
| **Kolmogorov-Smirnov** | **D** | 0.118725 | **Pr > D** | 0.0348 |
| **Cramer-von Mises** | **W-Sq** | 0.185364 | **Pr > W-Sq** | 0.0081 |
| **Anderson-Darling** | **A-Sq** | 1.272549 | **Pr > A-Sq** | <0.0050 |

| **Quantiles (Definition 5)** | |
| --- | --- |
| **Quantile** | **Estimate** |
| **100% Max** | 2.328217 |
| **99%** | 2.328217 |
| **95%** | 1.535819 |
| **90%** | 1.007455 |
| **75% Q3** | 0.299943 |
| **50% Median** | -0.103807 |
| **25% Q1** | -0.555045 |
| **10%** | -0.762455 |
| **5%** | -0.883807 |
| **1%** | -1.121783 |
| **0% Min** | -1.121783 |

| **Extreme Observations** | | | |
| --- | --- | --- | --- |
| **Lowest** | | **Highest** | |
| **Value** | **Obs** | **Value** | **Obs** |
| -1.121783 | 1 | 1.17592 | 20 |
| -0.964078 | 4 | 1.40822 | 5 |
| -0.900831 | 46 | 1.66342 | 24 |
| -0.866783 | 37 | 2.07669 | 3 |
| -0.865808 | 35 | 2.32822 | 45 |

|  |
| --- |
| Stem Leaf # Boxplot  22 3 1 0  20 8 1 0  18  16 6 1 0  14 1 1 |  12 |  10 38 2 |  8 29 2 |  6 |  4 114789 6 |  2 122364 6 +-----+  0 012334 6 | + |  -0 43319811 8 \*-----\*  -2 2154200 7 | |  -4 65500 5 +-----+  -6 665321976 9 |  -8 6077 4 |  -10 2 1 |  ----+----+----+----+  Multiply Stem.Leaf by 10\*\*-1      Normal Probability Plot  2.3+ \*  | \*  | +  | \* +++  | \* ++  | +++  | \*\*++  | \*\*+  | ++  | ++\*\*\*\*  | ++\*\*\*  | ++\*\*\*  | \*\*\*\*  | \*\*\*\*  | +\*\*\*  | \*\*\*\*\*\*  | \* \*\* \*+++  -1.1+ \* +++  +----+----+----+----+----+----+----+----+----+----+  -2 -1 0 +1 +2 |

|  |
| --- |
| The SAS System |

|  |
| --- |
| Plot of Resid\*Pred. Legend: A = 1 obs, B = 2 obs, etc.    ‚  ‚  2.5 ˆ  ‚  ‚ A  ‚  ‚ A  2.0 ˆ  ‚  ‚  ‚ A  ‚  1.5 ˆ  ‚ A  ‚  ‚ A  ‚ A  1.0 ˆ  R ‚ A  e ‚ A  s ‚  i ‚ A  d 0.5 ˆ A A  u ‚ A A A  a ‚ A A  l ‚ A BA  ‚ A A  0.0 ˆƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒAƒƒƒƒAƒƒƒƒƒƒƒƒƒƒAƒAƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒAƒƒƒƒƒƒƒƒƒƒƒAƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒ  ‚ A A A A A A  ‚ AA A A A  ‚ A A  ‚ A A  -0.5 ˆ A  ‚ A A  ‚ A A A A A A  ‚ A A A  ‚ A A A  -1.0 ˆ A  ‚ A  ‚  ‚  ‚  -1.5 ˆ  ‚  Šˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒˆƒ  0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25    Predicted |

|  |
| --- |
| The SAS System |

The Mixed Procedure

| **Model Information** | |
| --- | --- |
| **Data Set** | WORK.CORNCARRYOVER2014 |
| **Dependent Variable** | logoatdrywt |
| **Covariance Structure** | Variance Components |
| **Estimation Method** | REML |
| **Residual Variance Method** | Profile |
| **Fixed Effects SE Method** | Model-Based |
| **Degrees of Freedom Method** | Containment |

| **Class Level Information** | | |
| --- | --- | --- |
| **Class** | **Levels** | **Values** |
| **block** | 4 | 1 2 3 4 |
| **trt** | 15 | 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 |

| **Dimensions** | |
| --- | --- |
| **Covariance Parameters** | 2 |
| **Columns in X** | 16 |
| **Columns in Z** | 4 |
| **Subjects** | 1 |
| **Max Obs Per Subject** | 60 |

| **Number of Observations** | |
| --- | --- |
| **Number of Observations Read** | 60 |
| **Number of Observations Used** | 60 |
| **Number of Observations Not Used** | 0 |

| **Iteration History** | | | |
| --- | --- | --- | --- |
| **Iteration** | **Evaluations** | **-2 Res Log Like** | **Criterion** |
| **0** | 1 | 126.20434354 |  |
| **1** | 1 | 117.37783146 | 0.00000000 |

|  |
| --- |
| Convergence criteria met. |

| **Covariance Parameter Estimates** | |
| --- | --- |
| **Cov Parm** | **Estimate** |
| **block** | 0.1683 |
| **Residual** | 0.4410 |

| **Fit Statistics** | |
| --- | --- |
| **-2 Res Log Likelihood** | 117.4 |
| **AIC (smaller is better)** | 121.4 |
| **AICC (smaller is better)** | 121.7 |
| **BIC (smaller is better)** | 120.2 |

| **Type 3 Tests of Fixed Effects** | | | | |
| --- | --- | --- | --- | --- |
| **Effect** | **Num DF** | **Den DF** | **F Value** | **Pr > F** |
| **trt** | 14 | 42 | 0.64 | 0.8202 |

| **Least Squares Means** | | | | | | |
| --- | --- | --- | --- | --- | --- | --- |
| **Effect** | **trt** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** |
| **trt** | **1** | -0.1404 | 0.3903 | 42 | -0.36 | 0.7209 |
| **trt** | **2** | 0.02973 | 0.3903 | 42 | 0.08 | 0.9396 |
| **trt** | **3** | -0.1407 | 0.3903 | 42 | -0.36 | 0.7203 |
| **trt** | **4** | 0.4565 | 0.3903 | 42 | 1.17 | 0.2487 |
| **trt** | **5** | 0.3462 | 0.3903 | 42 | 0.89 | 0.3801 |
| **trt** | **6** | 0.4371 | 0.3903 | 42 | 1.12 | 0.2692 |
| **trt** | **7** | 0.08263 | 0.3903 | 42 | 0.21 | 0.8334 |
| **trt** | **8** | 0.3766 | 0.3903 | 42 | 0.97 | 0.3401 |
| **trt** | **9** | 0.3971 | 0.3903 | 42 | 1.02 | 0.3147 |
| **trt** | **10** | 0.008571 | 0.3903 | 42 | 0.02 | 0.9826 |
| **trt** | **11** | -0.1310 | 0.3903 | 42 | -0.34 | 0.7388 |
| **trt** | **12** | -0.3708 | 0.3903 | 42 | -0.95 | 0.3475 |
| **trt** | **13** | -0.1400 | 0.3903 | 42 | -0.36 | 0.7215 |
| **trt** | **14** | 0.3300 | 0.3903 | 42 | 0.85 | 0.4026 |
| **trt** | **15** | 0.08050 | 0.3903 | 42 | 0.21 | 0.8376 |

| **Differences of Least Squares Means** | | | | | | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Effect** | **trt** | **\_trt** | **Estimate** | **Standard Error** | **DF** | **t Value** | **Pr > |t|** | **Adjustment** | **Adj P** |
| **trt** | **1** | **2** | -0.1701 | 0.4696 | 42 | -0.36 | 0.7190 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **3** | 0.000349 | 0.4696 | 42 | 0.00 | 0.9994 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **4** | -0.5969 | 0.4696 | 42 | -1.27 | 0.2107 | Tukey-Kramer | 0.9928 |
| **trt** | **1** | **5** | -0.4865 | 0.4696 | 42 | -1.04 | 0.3061 | Tukey-Kramer | 0.9991 |
| **trt** | **1** | **6** | -0.5774 | 0.4696 | 42 | -1.23 | 0.2257 | Tukey-Kramer | 0.9948 |
| **trt** | **1** | **7** | -0.2230 | 0.4696 | 42 | -0.47 | 0.6374 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **8** | -0.5170 | 0.4696 | 42 | -1.10 | 0.2772 | Tukey-Kramer | 0.9983 |
| **trt** | **1** | **9** | -0.5375 | 0.4696 | 42 | -1.14 | 0.2589 | Tukey-Kramer | 0.9974 |
| **trt** | **1** | **10** | -0.1489 | 0.4696 | 42 | -0.32 | 0.7527 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **11** | -0.00934 | 0.4696 | 42 | -0.02 | 0.9842 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **12** | 0.2305 | 0.4696 | 42 | 0.49 | 0.6262 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **13** | -0.00031 | 0.4696 | 42 | -0.00 | 0.9995 | Tukey-Kramer | 1.0000 |
| **trt** | **1** | **14** | -0.4704 | 0.4696 | 42 | -1.00 | 0.3222 | Tukey-Kramer | 0.9994 |
| **trt** | **1** | **15** | -0.2209 | 0.4696 | 42 | -0.47 | 0.6406 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **3** | 0.1704 | 0.4696 | 42 | 0.36 | 0.7185 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **4** | -0.4268 | 0.4696 | 42 | -0.91 | 0.3686 | Tukey-Kramer | 0.9998 |
| **trt** | **2** | **5** | -0.3164 | 0.4696 | 42 | -0.67 | 0.5041 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **6** | -0.4073 | 0.4696 | 42 | -0.87 | 0.3907 | Tukey-Kramer | 0.9999 |
| **trt** | **2** | **7** | -0.05290 | 0.4696 | 42 | -0.11 | 0.9108 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **8** | -0.3469 | 0.4696 | 42 | -0.74 | 0.4642 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **9** | -0.3674 | 0.4696 | 42 | -0.78 | 0.4384 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **10** | 0.02116 | 0.4696 | 42 | 0.05 | 0.9643 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **11** | 0.1607 | 0.4696 | 42 | 0.34 | 0.7338 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **12** | 0.4005 | 0.4696 | 42 | 0.85 | 0.3985 | Tukey-Kramer | 0.9999 |
| **trt** | **2** | **13** | 0.1698 | 0.4696 | 42 | 0.36 | 0.7195 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **14** | -0.3003 | 0.4696 | 42 | -0.64 | 0.5260 | Tukey-Kramer | 1.0000 |
| **trt** | **2** | **15** | -0.05077 | 0.4696 | 42 | -0.11 | 0.9144 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **4** | -0.5972 | 0.4696 | 42 | -1.27 | 0.2105 | Tukey-Kramer | 0.9928 |
| **trt** | **3** | **5** | -0.4869 | 0.4696 | 42 | -1.04 | 0.3058 | Tukey-Kramer | 0.9991 |
| **trt** | **3** | **6** | -0.5778 | 0.4696 | 42 | -1.23 | 0.2254 | Tukey-Kramer | 0.9948 |
| **trt** | **3** | **7** | -0.2233 | 0.4696 | 42 | -0.48 | 0.6368 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **8** | -0.5173 | 0.4696 | 42 | -1.10 | 0.2769 | Tukey-Kramer | 0.9983 |
| **trt** | **3** | **9** | -0.5378 | 0.4696 | 42 | -1.15 | 0.2586 | Tukey-Kramer | 0.9974 |
| **trt** | **3** | **10** | -0.1493 | 0.4696 | 42 | -0.32 | 0.7522 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **11** | -0.00969 | 0.4696 | 42 | -0.02 | 0.9836 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **12** | 0.2301 | 0.4696 | 42 | 0.49 | 0.6267 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **13** | -0.00066 | 0.4696 | 42 | -0.00 | 0.9989 | Tukey-Kramer | 1.0000 |
| **trt** | **3** | **14** | -0.4707 | 0.4696 | 42 | -1.00 | 0.3219 | Tukey-Kramer | 0.9994 |
| **trt** | **3** | **15** | -0.2212 | 0.4696 | 42 | -0.47 | 0.6400 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **5** | 0.1103 | 0.4696 | 42 | 0.23 | 0.8154 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **6** | 0.01946 | 0.4696 | 42 | 0.04 | 0.9671 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **7** | 0.3739 | 0.4696 | 42 | 0.80 | 0.4304 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **8** | 0.07988 | 0.4696 | 42 | 0.17 | 0.8658 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **9** | 0.05938 | 0.4696 | 42 | 0.13 | 0.9000 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **10** | 0.4479 | 0.4696 | 42 | 0.95 | 0.3456 | Tukey-Kramer | 0.9996 |
| **trt** | **4** | **11** | 0.5875 | 0.4696 | 42 | 1.25 | 0.2178 | Tukey-Kramer | 0.9938 |
| **trt** | **4** | **12** | 0.8273 | 0.4696 | 42 | 1.76 | 0.0854 | Tukey-Kramer | 0.8999 |
| **trt** | **4** | **13** | 0.5966 | 0.4696 | 42 | 1.27 | 0.2109 | Tukey-Kramer | 0.9929 |
| **trt** | **4** | **14** | 0.1265 | 0.4696 | 42 | 0.27 | 0.7890 | Tukey-Kramer | 1.0000 |
| **trt** | **4** | **15** | 0.3760 | 0.4696 | 42 | 0.80 | 0.4278 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **6** | -0.09088 | 0.4696 | 42 | -0.19 | 0.8475 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **7** | 0.2635 | 0.4696 | 42 | 0.56 | 0.5776 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **8** | -0.03046 | 0.4696 | 42 | -0.06 | 0.9486 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **9** | -0.05095 | 0.4696 | 42 | -0.11 | 0.9141 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **10** | 0.3376 | 0.4696 | 42 | 0.72 | 0.4762 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **11** | 0.4772 | 0.4696 | 42 | 1.02 | 0.3154 | Tukey-Kramer | 0.9993 |
| **trt** | **5** | **12** | 0.7170 | 0.4696 | 42 | 1.53 | 0.1343 | Tukey-Kramer | 0.9647 |
| **trt** | **5** | **13** | 0.4862 | 0.4696 | 42 | 1.04 | 0.3064 | Tukey-Kramer | 0.9991 |
| **trt** | **5** | **14** | 0.01614 | 0.4696 | 42 | 0.03 | 0.9727 | Tukey-Kramer | 1.0000 |
| **trt** | **5** | **15** | 0.2657 | 0.4696 | 42 | 0.57 | 0.5746 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **7** | 0.3544 | 0.4696 | 42 | 0.75 | 0.4546 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **8** | 0.06042 | 0.4696 | 42 | 0.13 | 0.8982 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **9** | 0.03993 | 0.4696 | 42 | 0.09 | 0.9326 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **10** | 0.4285 | 0.4696 | 42 | 0.91 | 0.3667 | Tukey-Kramer | 0.9998 |
| **trt** | **6** | **11** | 0.5681 | 0.4696 | 42 | 1.21 | 0.2332 | Tukey-Kramer | 0.9955 |
| **trt** | **6** | **12** | 0.8079 | 0.4696 | 42 | 1.72 | 0.0927 | Tukey-Kramer | 0.9147 |
| **trt** | **6** | **13** | 0.5771 | 0.4696 | 42 | 1.23 | 0.2259 | Tukey-Kramer | 0.9948 |
| **trt** | **6** | **14** | 0.1070 | 0.4696 | 42 | 0.23 | 0.8208 | Tukey-Kramer | 1.0000 |
| **trt** | **6** | **15** | 0.3566 | 0.4696 | 42 | 0.76 | 0.4519 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **8** | -0.2940 | 0.4696 | 42 | -0.63 | 0.5346 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **9** | -0.3145 | 0.4696 | 42 | -0.67 | 0.5067 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **10** | 0.07406 | 0.4696 | 42 | 0.16 | 0.8754 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **11** | 0.2136 | 0.4696 | 42 | 0.45 | 0.6515 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **12** | 0.4534 | 0.4696 | 42 | 0.97 | 0.3398 | Tukey-Kramer | 0.9996 |
| **trt** | **7** | **13** | 0.2227 | 0.4696 | 42 | 0.47 | 0.6378 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **14** | -0.2474 | 0.4696 | 42 | -0.53 | 0.6011 | Tukey-Kramer | 1.0000 |
| **trt** | **7** | **15** | 0.002130 | 0.4696 | 42 | 0.00 | 0.9964 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **9** | -0.02049 | 0.4696 | 42 | -0.04 | 0.9654 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **10** | 0.3681 | 0.4696 | 42 | 0.78 | 0.4376 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **11** | 0.5076 | 0.4696 | 42 | 1.08 | 0.2859 | Tukey-Kramer | 0.9986 |
| **trt** | **8** | **12** | 0.7474 | 0.4696 | 42 | 1.59 | 0.1190 | Tukey-Kramer | 0.9512 |
| **trt** | **8** | **13** | 0.5167 | 0.4696 | 42 | 1.10 | 0.2775 | Tukey-Kramer | 0.9983 |
| **trt** | **8** | **14** | 0.04660 | 0.4696 | 42 | 0.10 | 0.9214 | Tukey-Kramer | 1.0000 |
| **trt** | **8** | **15** | 0.2961 | 0.4696 | 42 | 0.63 | 0.5317 | Tukey-Kramer | 1.0000 |
| **trt** | **9** | **10** | 0.3886 | 0.4696 | 42 | 0.83 | 0.4127 | Tukey-Kramer | 0.9999 |
| **trt** | **9** | **11** | 0.5281 | 0.4696 | 42 | 1.12 | 0.2671 | Tukey-Kramer | 0.9979 |
| **trt** | **9** | **12** | 0.7679 | 0.4696 | 42 | 1.64 | 0.1095 | Tukey-Kramer | 0.9404 |
| **trt** | **9** | **13** | 0.5372 | 0.4696 | 42 | 1.14 | 0.2591 | Tukey-Kramer | 0.9974 |
| **trt** | **9** | **14** | 0.06709 | 0.4696 | 42 | 0.14 | 0.8871 | Tukey-Kramer | 1.0000 |
| **trt** | **9** | **15** | 0.3166 | 0.4696 | 42 | 0.67 | 0.5038 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **11** | 0.1396 | 0.4696 | 42 | 0.30 | 0.7678 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **12** | 0.3794 | 0.4696 | 42 | 0.81 | 0.4237 | Tukey-Kramer | 0.9999 |
| **trt** | **10** | **13** | 0.1486 | 0.4696 | 42 | 0.32 | 0.7532 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **14** | -0.3215 | 0.4696 | 42 | -0.68 | 0.4974 | Tukey-Kramer | 1.0000 |
| **trt** | **10** | **15** | -0.07193 | 0.4696 | 42 | -0.15 | 0.8790 | Tukey-Kramer | 1.0000 |
| **trt** | **11** | **12** | 0.2398 | 0.4696 | 42 | 0.51 | 0.6123 | Tukey-Kramer | 1.0000 |
| **trt** | **11** | **13** | 0.009037 | 0.4696 | 42 | 0.02 | 0.9847 | Tukey-Kramer | 1.0000 |
| **trt** | **11** | **14** | -0.4610 | 0.4696 | 42 | -0.98 | 0.3318 | Tukey-Kramer | 0.9995 |
| **trt** | **11** | **15** | -0.2115 | 0.4696 | 42 | -0.45 | 0.6547 | Tukey-Kramer | 1.0000 |
| **trt** | **12** | **13** | -0.2308 | 0.4696 | 42 | -0.49 | 0.6257 | Tukey-Kramer | 1.0000 |
| **trt** | **12** | **14** | -0.7008 | 0.4696 | 42 | -1.49 | 0.1431 | Tukey-Kramer | 0.9706 |
| **trt** | **12** | **15** | -0.4513 | 0.4696 | 42 | -0.96 | 0.3420 | Tukey-Kramer | 0.9996 |
| **trt** | **13** | **14** | -0.4701 | 0.4696 | 42 | -1.00 | 0.3225 | Tukey-Kramer | 0.9994 |
| **trt** | **13** | **15** | -0.2205 | 0.4696 | 42 | -0.47 | 0.6410 | Tukey-Kramer | 1.0000 |
| **trt** | **14** | **15** | 0.2495 | 0.4696 | 42 | 0.53 | 0.5980 | Tukey-Kramer | 1.0000 |

|  |
| --- |
| The SAS System |

The UNIVARIATE Procedure

Variable: Resid (Residual)

| **Moments** | | | |
| --- | --- | --- | --- |
| **N** | 60 | **Sum Weights** | 60 |
| **Mean** | 0 | **Sum Observations** | 0 |
| **Std Deviation** | 0.56329325 | **Variance** | 0.31729928 |
| **Skewness** | -0.2646668 | **Kurtosis** | 2.36519563 |
| **Uncorrected SS** | 18.7206577 | **Corrected SS** | 18.7206577 |
| **Coeff Variation** | . | **Std Error Mean** | 0.07272085 |

| **Basic Statistical Measures** | | | |
| --- | --- | --- | --- |
| **Location** | | **Variability** | |
| **Mean** | 0.00000 | **Std Deviation** | 0.56329 |
| **Median** | -0.02242 | **Variance** | 0.31730 |
| **Mode** | . | **Range** | 3.58734 |
|  |  | **Interquartile Range** | 0.53400 |

| **Tests for Location: Mu0=0** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Student's t** | **t** | 0 | **Pr > |t|** | 1.0000 |
| **Sign** | **M** | -1 | **Pr >= |M|** | 0.8974 |
| **Signed Rank** | **S** | 50 | **Pr >= |S|** | 0.7161 |

| **Tests for Normality** | | | | |
| --- | --- | --- | --- | --- |
| **Test** | **Statistic** | | **p Value** | |
| **Shapiro-Wilk** | **W** | 0.958496 | **Pr < W** | 0.0397 |
| **Kolmogorov-Smirnov** | **D** | 0.124816 | **Pr > D** | 0.0204 |
| **Cramer-von Mises** | **W-Sq** | 0.152787 | **Pr > W-Sq** | 0.0220 |
| **Anderson-Darling** | **A-Sq** | 0.864912 | **Pr > A-Sq** | 0.0247 |

| **Quantiles (Definition 5)** | |
| --- | --- |
| **Quantile** | **Estimate** |
| **100% Max** | 1.6924214 |
| **99%** | 1.6924214 |
| **95%** | 0.9099416 |
| **90%** | 0.5244003 |
| **75% Q3** | 0.3165213 |
| **50% Median** | -0.0224188 |
| **25% Q1** | -0.2174785 |
| **10%** | -0.6789194 |
| **5%** | -0.9794983 |
| **1%** | -1.8949191 |
| **0% Min** | -1.8949191 |

| **Extreme Observations** | | | |
| --- | --- | --- | --- |
| **Lowest** | | **Highest** | |
| **Value** | **Obs** | **Value** | **Obs** |
| -1.894919 | 46 | 0.643619 | 24 |
| -1.091481 | 6 | 0.796260 | 49 |
| -1.041003 | 1 | 1.023623 | 5 |
| -0.917994 | 37 | 1.172973 | 3 |
| -0.802509 | 41 | 1.692421 | 45 |

|  |
| --- |
| Stem Leaf # Boxplot  16 9 1 0  14  12  10 27 2 0  8 0 1 |  6 4 1 |  4 366014 6 |  2 14522239 8 +-----+  0 5955556788 10 | + |  -0 665532288744322 15 \*-----\*  -2 76330 5 +-----+  -4 508 3 |  -6 153 3 |  -8 20 2 |  -10 94 2 0  -12  -14  -16  -18 9 1 \*  ----+----+----+----+  Multiply Stem.Leaf by 10\*\*-1      Normal Probability Plot  1.7+ \*  | +  | +++  | \*+\*++  | +++  | +++\* \*  | +\*\*\*\*\*  | +\*\*\*\*\*  | +\*\*\*\*\*  -0.1+ \*\*\*\*\*\*\*  | \*\*\*\*++  | \*\*\*+  | +\*\*\*  | +\*+\*  | ++\*+\*  | +++  |+  |  -1.9+ \*  +----+----+----+----+----+----+----+----+----+----+  -2 -1 0 +1 +2 |

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| The SAS System |

|  |
| --- |
| Plot of Resid\*Pred. Legend: A = 1 obs, B = 2 obs, etc.    ‚  ‚  2.0 ˆ  ‚  ‚  ‚ A  ‚  1.5 ˆ  ‚  ‚  ‚ A  ‚  1.0 ˆ A  ‚  ‚ A  ‚  ‚ A  0.5 ˆ B A A A  R ‚ A A  e ‚ A A A A A  s ‚ A A A AA A B A  i ‚ A A A  d 0.0 ˆƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒAƒƒAƒƒƒƒƒƒƒƒƒƒAƒƒƒƒƒƒAƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒƒAƒƒƒƒƒ  u ‚ BA AAA A  a ‚ A A A A A A  l ‚  ‚ A A  -0.5 ˆ A A A  ‚ A  ‚ A A  ‚ A  ‚ A  -1.0 ˆ A  ‚ A  ‚  ‚  ‚  -1.5 ˆ  ‚  ‚  ‚  ‚ A  -2.0 ˆ  ‚  Šƒƒˆƒƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒƒˆƒƒƒƒƒƒƒƒƒƒƒˆƒƒ  -1.00 -0.75 -0.50 -0.25 0.00 0.25 0.50 0.75    Predicted |