品类售价

水生根茎类

单位根检验:

Augmented Dickey-Fuller Results

=====================================

Test Statistic -6.220

P-value 0.000

Lags 10

-------------------------------------

Trend: Constant

Critical Values: -3.48 (1%), -2.88 (5%), -2.58 (10%)

Null Hypothesis: The process contains a unit root.

Alternative Hypothesis: The process is weakly stationary.

白噪声检验:

lb\_stat lb\_pvalue bp\_stat bp\_pvalue

1 12.05731 0.00052 11.81616 0.00059

2 35.19702 0.00000 34.33881 0.00000

3 39.34850 0.00000 38.35192 0.00000

4 42.27680 0.00000 41.16308 0.00000

5 45.72718 0.00000 44.45244 0.00000

6 45.82828 0.00000 44.54815 0.00000

7 46.94401 0.00000 45.59693 0.00000

8 47.08805 0.00000 45.73138 0.00000

9 47.22545 0.00000 45.85869 0.00000

10 48.38677 0.00000 46.92712 0.00000

11 48.64244 0.00000 47.16062 0.00000

模型参数

AIC (3, 1)

BIC (3, 1)

食用菌

单位根检验:

Augmented Dickey-Fuller Results

=====================================

Test Statistic -12.676

P-value 0.000

Lags 2

-------------------------------------

Trend: Constant

Critical Values: -3.48 (1%), -2.88 (5%), -2.58 (10%)

Null Hypothesis: The process contains a unit root.

Alternative Hypothesis: The process is weakly stationary.

白噪声检验:

lb\_stat lb\_pvalue bp\_stat bp\_pvalue

1 22.22681 0.00000 21.77627 0.00000

2 24.17598 0.00001 23.67275 0.00001

3 24.22414 0.00002 23.71929 0.00003

4 25.18228 0.00005 24.63858 0.00006

5 25.20341 0.00013 24.65872 0.00016

6 25.75716 0.00025 25.18253 0.00032

7 25.76059 0.00056 25.18576 0.00070

8 26.33597 0.00092 25.72226 0.00117

9 27.08071 0.00136 26.41165 0.00175

10 29.91406 0.00088 29.01526 0.00124

11 29.95109 0.00161 29.04905 0.00223

模型参数

AIC (2, 2)

BIC (1, 1)

茄类

单位根检验:

Augmented Dickey-Fuller Results

=====================================

Test Statistic -12.111

P-value 0.000

Lags 1

-------------------------------------

Trend: Constant

Critical Values: -3.48 (1%), -2.88 (5%), -2.58 (10%)

Null Hypothesis: The process contains a unit root.

Alternative Hypothesis: The process is weakly stationary.

白噪声检验:

lb\_stat lb\_pvalue bp\_stat bp\_pvalue

1 12.14042 0.00049 11.89433 0.00056

2 14.90701 0.00058 14.58615 0.00068

3 15.37187 0.00152 15.03530 0.00179

4 15.67234 0.00349 15.32359 0.00408

5 16.05295 0.00669 15.68620 0.00780

6 16.06080 0.01343 15.69362 0.01550

7 16.12570 0.02399 15.75458 0.02746

8 16.47585 0.03605 16.08107 0.04123

9 16.62589 0.05491 16.21996 0.06243

10 17.59337 0.06222 17.10899 0.07199

11 21.41107 0.02935 20.59136 0.03786

模型参数

AIC (1, 1)

BIC (1, 1)

辣椒类

单位根检验:

Augmented Dickey-Fuller Results

=====================================

Test Statistic -7.186

P-value 0.000

Lags 5

-------------------------------------

Trend: Constant

Critical Values: -3.48 (1%), -2.88 (5%), -2.58 (10%)

Null Hypothesis: The process contains a unit root.

Alternative Hypothesis: The process is weakly stationary.

白噪声检验:

lb\_stat lb\_pvalue bp\_stat bp\_pvalue

1 24.93010 0.00000 24.42476 0.00000

2 25.52664 0.00000 25.00517 0.00000

3 28.76877 0.00000 28.13778 0.00000

4 29.31420 0.00001 28.66109 0.00001

5 30.07165 0.00001 29.38272 0.00002

6 37.80450 0.00000 36.69757 0.00000

7 41.32379 0.00000 40.00285 0.00000

8 41.56556 0.00000 40.22829 0.00000

9 41.93830 0.00000 40.57333 0.00001

10 42.37982 0.00001 40.97905 0.00001

11 42.46076 0.00001 41.05288 0.00002

模型参数

AIC (3, 4)

BIC (1, 1)

花叶类

单位根检验:

Augmented Dickey-Fuller Results

=====================================

Test Statistic -12.542

P-value 0.000

Lags 2

-------------------------------------

Trend: Constant

Critical Values: -3.48 (1%), -2.88 (5%), -2.58 (10%)

Null Hypothesis: The process contains a unit root.

Alternative Hypothesis: The process is weakly stationary.

白噪声检验:

lb\_stat lb\_pvalue bp\_stat bp\_pvalue

1 17.10835 0.00004 16.76156 0.00004

2 18.68986 0.00009 18.30033 0.00011

3 20.58179 0.00013 20.12833 0.00016

4 27.40871 0.00002 26.67849 0.00002

5 30.43980 0.00001 29.56622 0.00002

6 30.84889 0.00003 29.95319 0.00004

7 31.22228 0.00006 30.30388 0.00008

8 31.71743 0.00010 30.76558 0.00015

9 31.71743 0.00022 30.76558 0.00032

10 32.93459 0.00028 31.88405 0.00042

11 36.14745 0.00016 34.81470 0.00027

模型参数

AIC (2, 3)

BIC (1, 1)

花菜类

单位根检验:

Augmented Dickey-Fuller Results

=====================================

Test Statistic -15.256

P-value 0.000

Lags 0

-------------------------------------

Trend: Constant

Critical Values: -3.48 (1%), -2.88 (5%), -2.58 (10%)

Null Hypothesis: The process contains a unit root.

Alternative Hypothesis: The process is weakly stationary.

白噪声检验:

lb\_stat lb\_pvalue bp\_stat bp\_pvalue

1 8.53629 0.00348 8.36326 0.00383

2 8.60113 0.01356 8.42635 0.01480

3 9.08502 0.02818 8.89389 0.03074

4 10.21832 0.03691 9.98124 0.04074

5 10.22572 0.06909 9.98830 0.07557

6 10.97090 0.08928 10.69320 0.09833

7 11.04081 0.13685 10.75886 0.14949

8 11.69136 0.16551 11.36545 0.18184

9 11.75977 0.22719 11.42877 0.24746

10 12.56034 0.24930 12.16443 0.27420

11 14.11462 0.22672 13.58219 0.25698

模型参数

AIC (1, 1)

BIC (1, 1)

品类模型拟合，预测，残差检验

水生根茎类

SARIMAX Results

==============================================================================

Dep. Variable: 水生根茎类 No. Observations: 149

Model: ARIMA(3, 1, 1) Log Likelihood -313.428

Date: Sun, 10 Sep 2023 AIC 636.856

Time: 05:11:35 BIC 651.842

Sample: 02-02-2023 HQIC 642.945

- 06-30-2023

Covariance Type: opg

==============================================================================

coef std err z P>|z| [0.025 0.975]

------------------------------------------------------------------------------

ar.L1 0.1799 0.165 1.092 0.275 -0.143 0.503

ar.L2 -0.2899 0.101 -2.875 0.004 -0.487 -0.092

ar.L3 0.1548 0.112 1.378 0.168 -0.065 0.375

ma.L1 -0.7776 0.129 -6.029 0.000 -1.030 -0.525

sigma2 4.0160 0.343 11.707 0.000 3.344 4.688

===================================================================================

Ljung-Box (L1) (Q): 0.17 Jarque-Bera (JB): 42.03

Prob(Q): 0.68 Prob(JB): 0.00

Heteroskedasticity (H): 1.98 Skew: 0.93

Prob(H) (two-sided): 0.02 Kurtosis: 4.84

===================================================================================

Warnings:

[1] Covariance matrix calculated using the outer product of gradients (complex-step).

作为期7天的预测:

2023-07-01 18.079085

2023-07-02 18.196364

2023-07-03 18.100180

2023-07-04 18.091476

2023-07-05 18.135941

2023-07-06 18.131579

2023-07-07 18.116557

Freq: D, Name: predicted\_mean, dtype: float64

残差序列的白噪声检验结果为： lb\_stat lb\_pvalue

1 0.327016 0.567422

食用菌

SARIMAX Results

==============================================================================

Dep. Variable: 食用菌 No. Observations: 149

Model: ARIMA(2, 1, 2) Log Likelihood -137.554

Date: Sun, 10 Sep 2023 AIC 285.108

Time: 05:11:36 BIC 300.094

Sample: 02-02-2023 HQIC 291.197

- 06-30-2023

Covariance Type: opg

==============================================================================

coef std err z P>|z| [0.025 0.975]

------------------------------------------------------------------------------

ar.L1 0.5228 0.349 1.499 0.134 -0.161 1.206

ar.L2 -0.2649 0.123 -2.158 0.031 -0.505 -0.024

ma.L1 -1.2534 0.355 -3.529 0.000 -1.950 -0.557

ma.L2 0.5014 0.266 1.887 0.059 -0.019 1.022

sigma2 0.3732 0.041 9.029 0.000 0.292 0.454

===================================================================================

Ljung-Box (L1) (Q): 0.00 Jarque-Bera (JB): 4.49

Prob(Q): 0.97 Prob(JB): 0.11

Heteroskedasticity (H): 0.80 Skew: 0.37

Prob(H) (two-sided): 0.44 Kurtosis: 3.42

===================================================================================

Warnings:

[1] Covariance matrix calculated using the outer product of gradients (complex-step).

作为期7天的预测:

2023-07-01 5.656336

2023-07-02 5.297659

2023-07-03 5.362438

2023-07-04 5.491311

2023-07-05 5.541533

2023-07-06 5.533656

2023-07-07 5.516236

Freq: D, Name: predicted\_mean, dtype: float64

残差序列的白噪声检验结果为： lb\_stat lb\_pvalue

1 0.377013 0.539206

茄类

SARIMAX Results

==============================================================================

Dep. Variable: 茄类 No. Observations: 149

Model: ARIMA(1, 1, 1) Log Likelihood -151.469

Date: Sun, 10 Sep 2023 AIC 308.937

Time: 05:11:36 BIC 317.929

Sample: 02-02-2023 HQIC 312.591

- 06-30-2023

Covariance Type: opg

==============================================================================

coef std err z P>|z| [0.025 0.975]

------------------------------------------------------------------------------

ar.L1 0.1544 0.154 1.004 0.316 -0.147 0.456

ma.L1 -0.5275 0.167 -3.159 0.002 -0.855 -0.200

sigma2 0.4528 0.045 10.041 0.000 0.364 0.541

===================================================================================

Ljung-Box (L1) (Q): 0.00 Jarque-Bera (JB): 50.26

Prob(Q): 0.99 Prob(JB): 0.00

Heteroskedasticity (H): 0.83 Skew: 0.49

Prob(H) (two-sided): 0.52 Kurtosis: 5.68

===================================================================================

Warnings:

[1] Covariance matrix calculated using the outer product of gradients (complex-step).

作为期7天的预测:

2023-07-01 7.887811

2023-07-02 7.854288

2023-07-03 7.849111

2023-07-04 7.848311

2023-07-05 7.848188

2023-07-06 7.848169

2023-07-07 7.848166

Freq: D, Name: predicted\_mean, dtype: float64

残差序列的白噪声检验结果为： lb\_stat lb\_pvalue

1 0.040052 0.84138

辣椒类

SARIMAX Results

==============================================================================

Dep. Variable: 辣椒类 No. Observations: 149

Model: ARIMA(3, 1, 4) Log Likelihood -119.071

Date: Sun, 10 Sep 2023 AIC 254.142

Time: 05:11:36 BIC 278.120

Sample: 02-02-2023 HQIC 263.885

- 06-30-2023

Covariance Type: opg

==============================================================================

coef std err z P>|z| [0.025 0.975]

------------------------------------------------------------------------------

ar.L1 0.2327 0.142 1.644 0.100 -0.045 0.510

ar.L2 -0.1453 0.103 -1.406 0.160 -0.348 0.057

ar.L3 0.6538 0.092 7.144 0.000 0.474 0.833

ma.L1 -0.7204 6816.805 -0.000 1.000 -1.34e+04 1.34e+04

ma.L2 0.2599 5773.851 4.5e-05 1.000 -1.13e+04 1.13e+04

ma.L3 -1.0918 2.16e+04 -5.04e-05 1.000 -4.24e+04 4.24e+04

ma.L4 0.5543 9069.740 6.11e-05 1.000 -1.78e+04 1.78e+04

sigma2 0.2769 4530.879 6.11e-05 1.000 -8880.082 8880.636

===================================================================================

Ljung-Box (L1) (Q): 0.08 Jarque-Bera (JB): 2.58

Prob(Q): 0.78 Prob(JB): 0.28

Heteroskedasticity (H): 0.62 Skew: 0.32

Prob(H) (two-sided): 0.09 Kurtosis: 3.08

===================================================================================

Warnings:

[1] Covariance matrix calculated using the outer product of gradients (complex-step).

作为期7天的预测:

2023-07-01 6.420348

2023-07-02 6.366530

2023-07-03 6.312784

2023-07-04 6.444407

2023-07-05 6.447668

2023-07-06 6.394160

2023-07-07 6.467282

Freq: D, Name: predicted\_mean, dtype: float64

残差序列的白噪声检验结果为： lb\_stat lb\_pvalue

1 0.075988 0.78281

花叶类

SARIMAX Results

==============================================================================

Dep. Variable: 花叶类 No. Observations: 149

Model: ARIMA(2, 1, 3) Log Likelihood -73.075

Date: Sun, 10 Sep 2023 AIC 158.149

Time: 05:11:36 BIC 176.132

Sample: 02-02-2023 HQIC 165.456

- 06-30-2023

Covariance Type: opg

==============================================================================

coef std err z P>|z| [0.025 0.975]

------------------------------------------------------------------------------

ar.L1 -0.6995 0.144 -4.847 0.000 -0.982 -0.417

ar.L2 -0.7768 0.112 -6.966 0.000 -0.995 -0.558

ma.L1 0.1523 0.144 1.056 0.291 -0.130 0.435

ma.L2 0.2021 0.120 1.683 0.092 -0.033 0.438

ma.L3 -0.6094 0.089 -6.817 0.000 -0.785 -0.434

sigma2 0.1561 0.018 8.620 0.000 0.121 0.192

===================================================================================

Ljung-Box (L1) (Q): 0.02 Jarque-Bera (JB): 0.81

Prob(Q): 0.90 Prob(JB): 0.67

Heteroskedasticity (H): 0.31 Skew: -0.15

Prob(H) (two-sided): 0.00 Kurtosis: 3.20

===================================================================================

Warnings:

[1] Covariance matrix calculated using the outer product of gradients (complex-step).

作为期7天的预测:

2023-07-01 5.098892

2023-07-02 5.129157

2023-07-03 5.260841

2023-07-04 5.145222

2023-07-05 5.123795

2023-07-06 5.228600

2023-07-07 5.171938

Freq: D, Name: predicted\_mean, dtype: float64

残差序列的白噪声检验结果为： lb\_stat lb\_pvalue

1 0.660879 0.41625

花菜类

SARIMAX Results

==============================================================================

Dep. Variable: 花菜类 No. Observations: 149

Model: ARIMA(1, 1, 1) Log Likelihood -141.068

Date: Sun, 10 Sep 2023 AIC 288.135

Time: 05:11:36 BIC 297.127

Sample: 02-02-2023 HQIC 291.788

- 06-30-2023

Covariance Type: opg

==============================================================================

coef std err z P>|z| [0.025 0.975]

------------------------------------------------------------------------------

ar.L1 0.2265 0.378 0.600 0.549 -0.514 0.967

ma.L1 -0.4746 0.359 -1.322 0.186 -1.178 0.229

sigma2 0.3937 0.032 12.267 0.000 0.331 0.457

===================================================================================

Ljung-Box (L1) (Q): 0.02 Jarque-Bera (JB): 34.77

Prob(Q): 0.88 Prob(JB): 0.00

Heteroskedasticity (H): 2.64 Skew: -0.05

Prob(H) (two-sided): 0.00 Kurtosis: 5.37

===================================================================================

Warnings:

[1] Covariance matrix calculated using the outer product of gradients (complex-step).

作为期7天的预测:

2023-07-01 12.044539

2023-07-02 12.073443

2023-07-03 12.079990

2023-07-04 12.081473

2023-07-05 12.081809

2023-07-06 12.081885

2023-07-07 12.081903

Freq: D, Name: predicted\_mean, dtype: float64

残差序列的白噪声检验结果为： lb\_stat lb\_pvalue

1 0.008432 0.926835