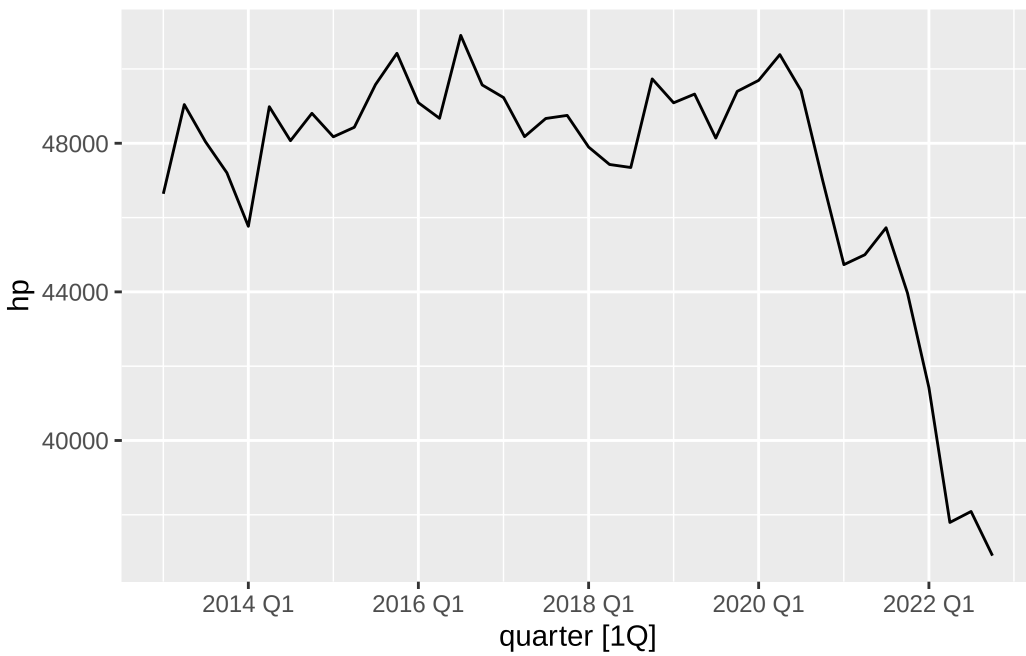
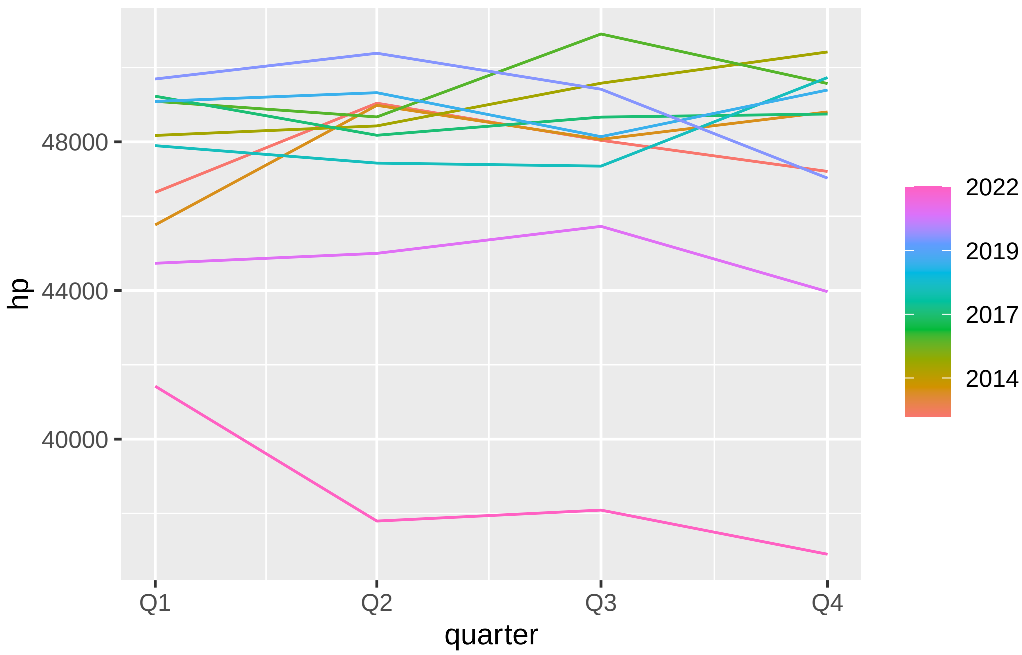
Hog Production (Fable)

ODH

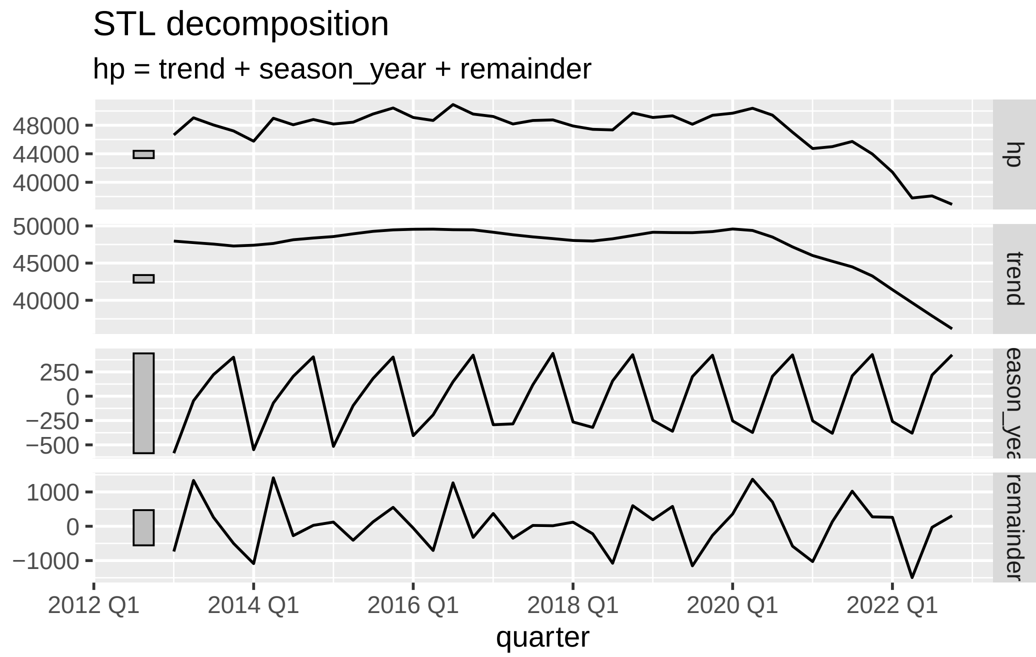
Hog Production Time Series



Seasonal Plot



STL Decomposition



Test of Stationarity

The Data

```
# A tibble: 1 x 2
  kpss_stat kpss_pvalue
      <dbl>       <dbl>
1     0.507      0.0400
```

The pvalue is less than 0.05. The data is not stationary. The date needs to be differenced.

1st Order Differencing

```
# A tibble: 1 x 2
  kpss_stat kpss_pvalue
      <dbl>       <dbl>
1     0.569      0.0262
```

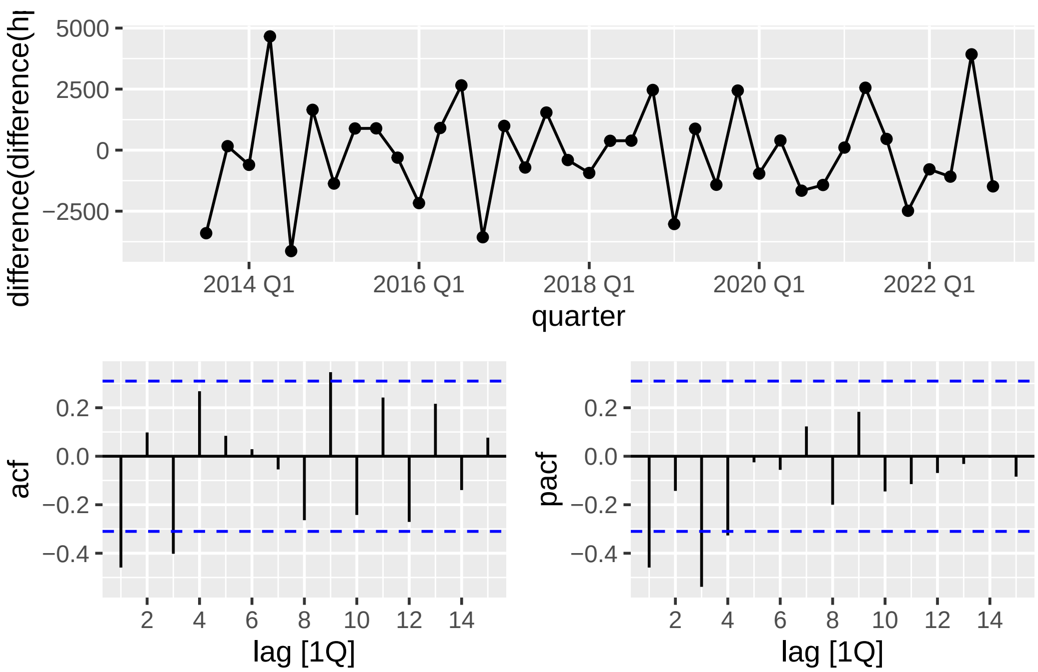
The pvalue is less than 0.05. The data is not stationary. The date needs to be differenced.

2nd Order Differencing

```
# A tibble: 1 x 2
  kpss_stat kpss_pvalue
      <dbl>       <dbl>
1    0.0931         0.1
```

The pvalue is greater than 0.05. The data is stationary.

ACF and PACF



ACF suggests an ARIMA(0,2,3) and PACF suggests an ARIMA(4,2,0).

Models

```
# A tibble: 4 x 6
  .model     sigma2 log_lik   AIC  AICc   BIC
  <chr>       <dbl>   <dbl> <dbl> <dbl> <dbl>
1 stepwise 1432740.   -325.  657.  657.  662.
2 search   1432740.   -325.  657.  657.  662.
3 arima420 1556602.   -324.  658.  660.  667.
```

```
4 arima023 1339772.   -324.  658.  660.  667.
```

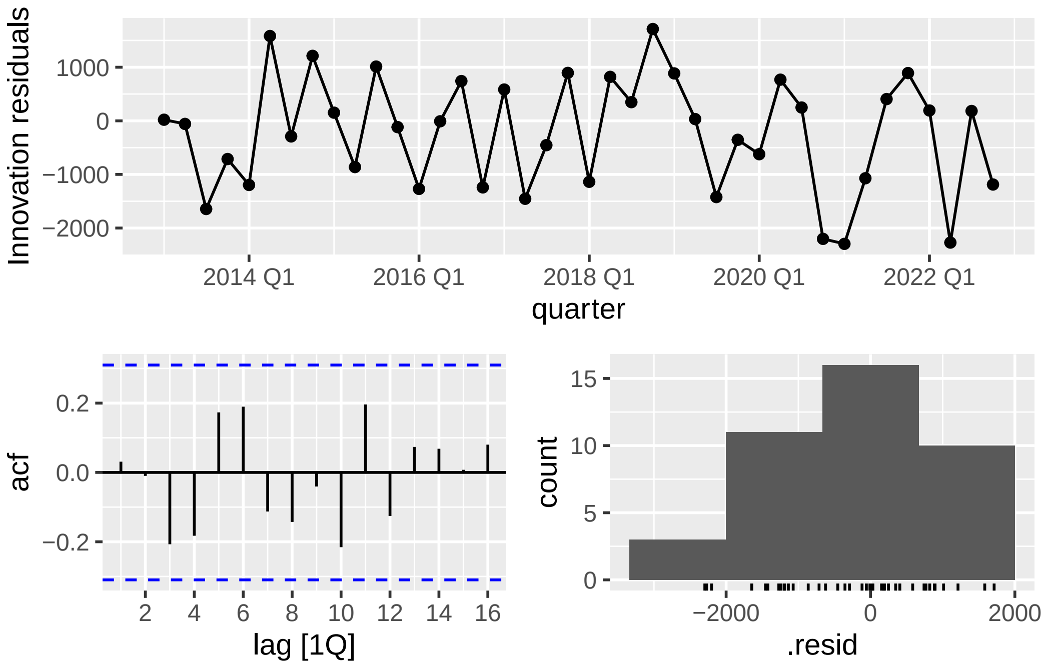
The stepwise and search models are autoarima models. They are actually the same model. The model is shown below.

```
# A mable: 1 x 1
                    search
                   <model>
1 <ARIMA(0,2,1)(0,0,1)[4]>
```

The best model is the autoarima model with the least AIC.

Residual Checking

arima023

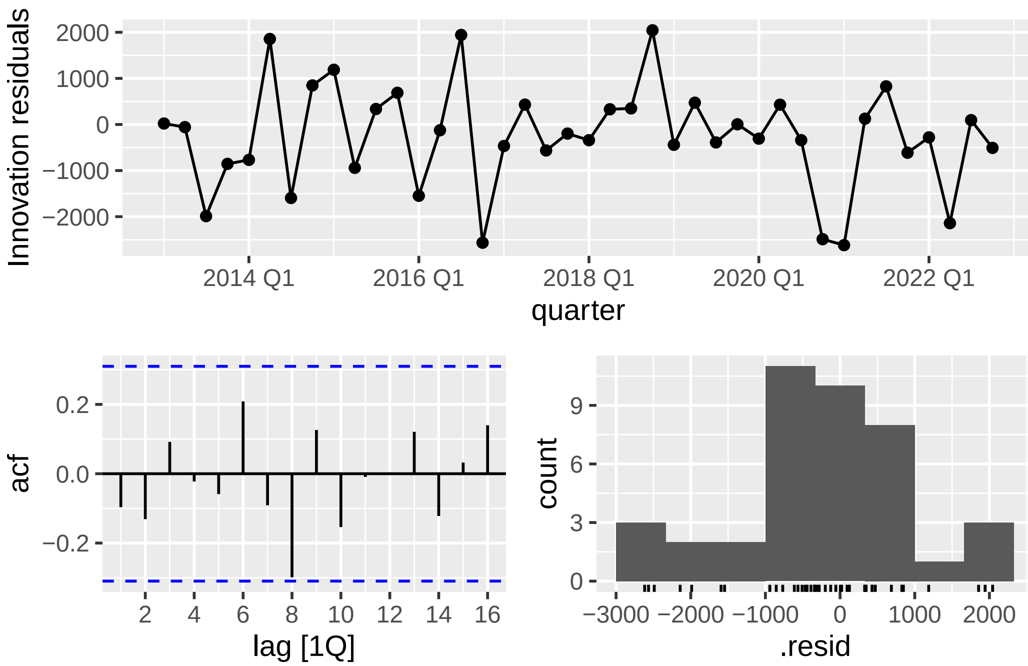


ACF are within the threshold limits, indicating that residuals are behaving like white noise.

```
# A tibble: 1 x 3
  .model   lb_stat lb_pvalue
  <chr>      <dbl>     <dbl>
1 arima023  0.0415     0.839
```

The pvalue is greater than 0.05, suggesting that the residuals are white noise.

arima420

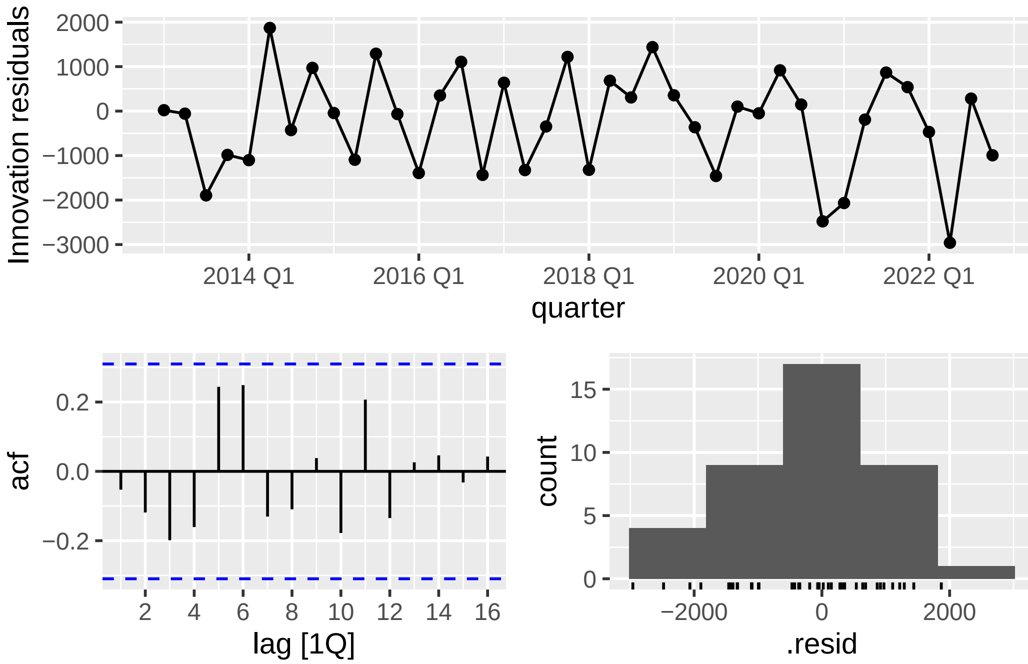


ACF are within the threshold limits, indicating that residuals are behaving like white noise.

```
# A tibble: 1 x 3
  .model   lb_stat lb_pvalue
  <chr>      <dbl>     <dbl>
1 arima420   0.401     0.527
```

The pvalue is greater than 0.05, suggesting that the residuals are white noise.

AutoARIMA



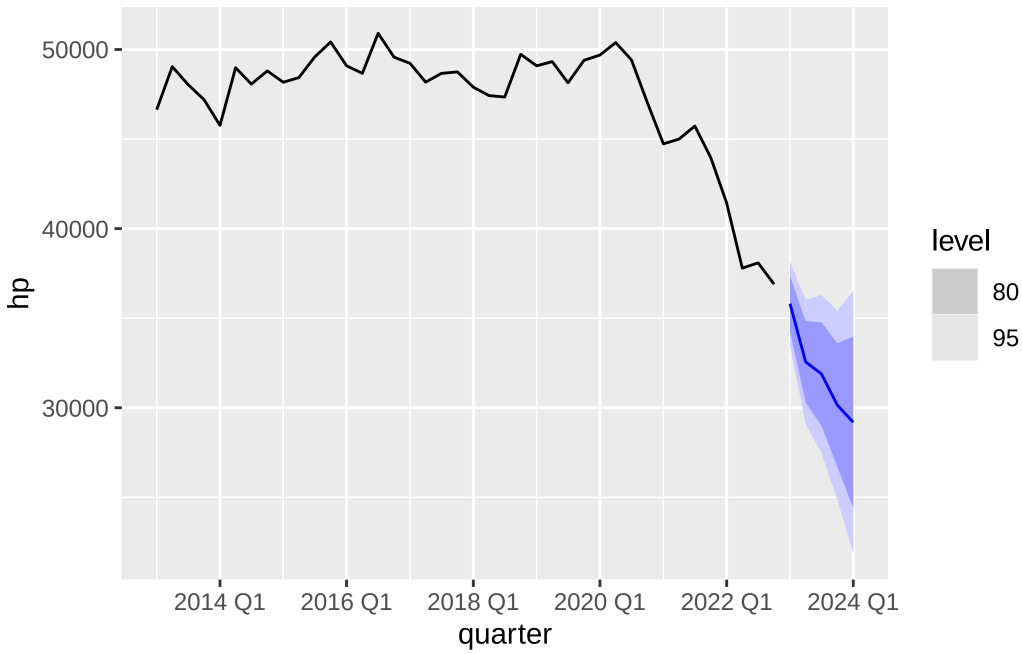
ACF are within the threshold limits, indicating that residuals are behaving like white noise.

```
# A tibble: 1 x 3
  .model lb_stat lb_pvalue
  <chr>    <dbl>     <dbl>
1 search   0.120     0.729
```

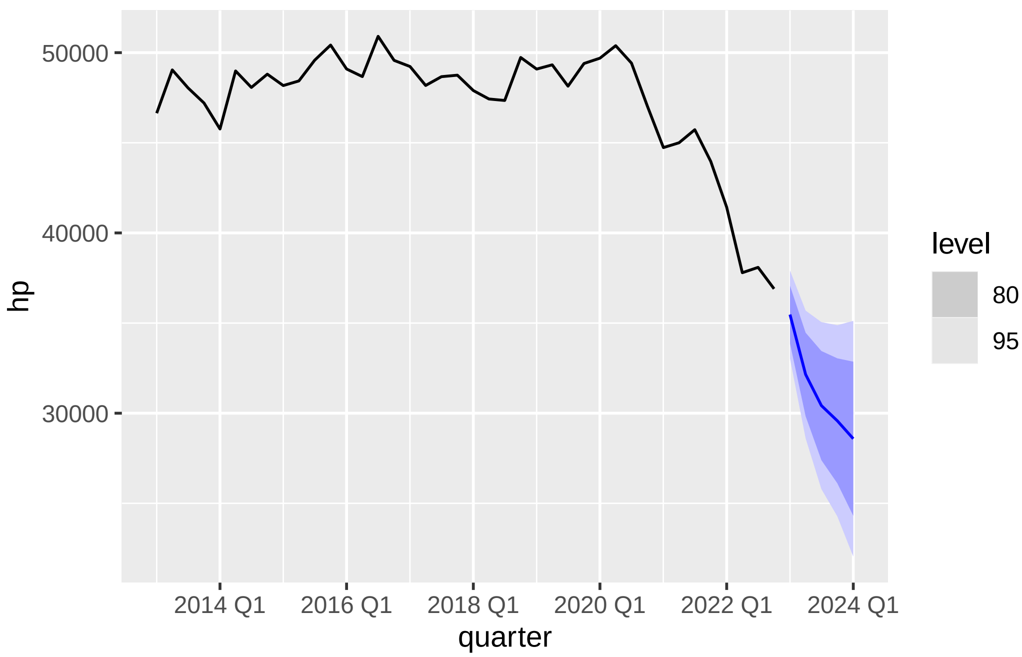
The pvalue is greater than 0.05, suggesting that the residuals are white noise.

5 Quarters Forecast

AutoARIMA Forecast



ARIMA(4,2,0) Forecast



ARIMA(0,2,3) Forecast