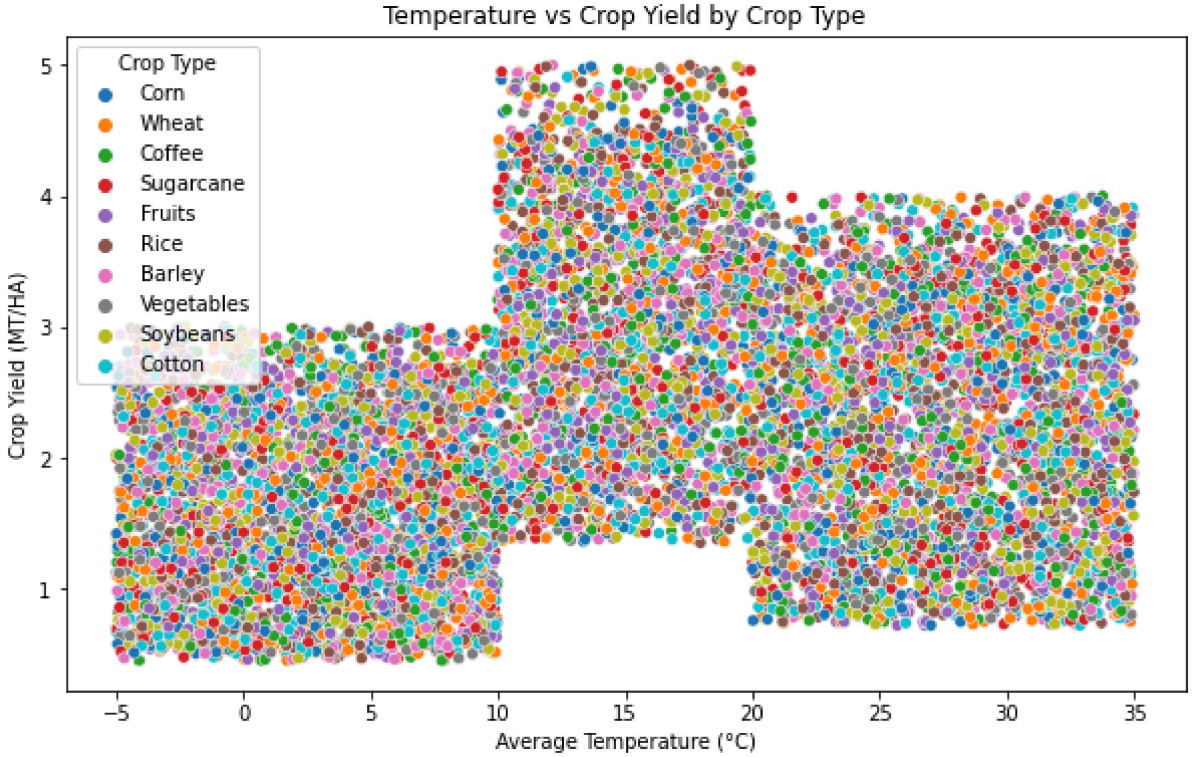
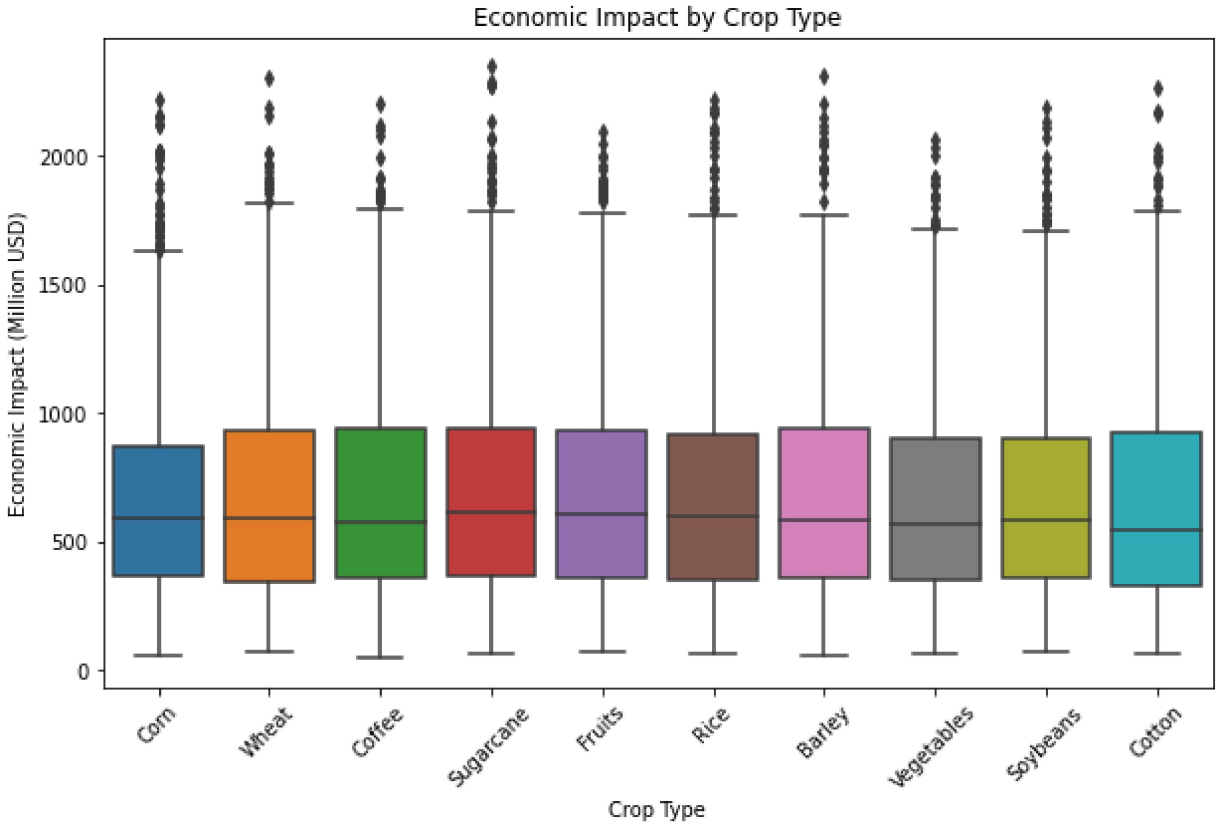
In [10]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.linear_model import LinearRegression
from sklearn.model_selection import train_test_split

df = pd.read_csv(r'C:\Users\PC30\Downloads\climate_change_impact_on_agriculture_2024


print("Preview of the dataset:")
print(df.head())

print("\nDataset information:")
print(df.info())

print("\nMissing values in each column:")
print(df.isnull().sum())


# Relationship between temperature and crop yield by crop type
plt.figure(figsize=(10, 6))
sns.scatterplot(data=df, x='Average_Temperature_C', y='Crop_Yield_MT_per_HA',
hue='Crop_Type')
plt.title('Temperature vs Crop Yield by Crop Type')
plt.xlabel('Average Temperature (°C)')
plt.ylabel('Crop Yield (MT/HA)')
plt.legend(title='Crop Type')
plt.show()


# Visualize economic impact per crop type
plt.figure(figsize=(10, 6))
sns.boxplot(data=df, x='Crop_Type', y='Economic_Impact_Million_USD')
plt.title("Economic Impact by Crop Type")
plt.xlabel('Crop Type')
plt.ylabel('Economic Impact (Million USD)')
plt.xticks(rotation=45)
plt.show()
```

```
Preview of the dataset:
   Year Country         Region  Crop_Type  Average_Temperature_C  \
0  2001   India    West Bengal       Corn                   1.55
1  2024   China          North       Corn                   3.23
2  2001  France  Ile-de-France      Wheat                  21.11
3  2001  Canada       Prairies     Coffee                  27.85
4  1998   India     Tamil Nadu  Sugarcane                   2.19

   Total_Precipitation_mm  CO2_Emissions_MT  Crop_Yield_MT_per_HA  \
0                  447.06             15.22                 1.737
1                 2913.57             29.82                 1.737
2                 1301.74             25.75                 1.719
3                 1154.36             13.91                 3.890
4                 1627.48             11.81                 1.080

   Extreme_Weather_Events  Irrigation_Access_%  Pesticide_Use_KG_per_HA  \
0                       8                14.54                    10.08
1                       8                11.05                    33.06
2                       5                84.42                    27.41
3                       5                94.06                    14.38
4                       9                95.75                    44.35

   Fertilizer_Use_KG_per_HA  Soil_Health_Index Adaptation_Strategies  \
0                     14.78              83.25      Water Management
1                     23.25              54.02         Crop Rotation
2                     65.53              67.78      Water Management
```

```
3                     87.58             91.39         No Adaptation
4                     88.08             49.61         Crop Rotation

   Economic_Impact_Million_USD
0                       808.13
1                       616.22
2                       796.96
3                       790.32
4                       401.72

Dataset information:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10000 entries, 0 to 9999
Data columns (total 15 columns):
 #   Column                       Non-Null Count  Dtype
---  ------                       --------------  -----
 0   Year                         10000 non-null  int64
 1   Country                      10000 non-null  object
 2   Region                       10000 non-null  object
 3   Crop_Type                    10000 non-null  object
 4   Average_Temperature_C        10000 non-null  float64
 5   Total_Precipitation_mm       10000 non-null  float64
 6   CO2_Emissions_MT             10000 non-null  float64
 7   Crop_Yield_MT_per_HA         10000 non-null  float64
 8   Extreme_Weather_Events       10000 non-null  int64
 9   Irrigation_Access_%          10000 non-null  float64
 10  Pesticide_Use_KG_per_HA      10000 non-null  float64
 11  Fertilizer_Use_KG_per_HA     10000 non-null  float64
 12  Soil_Health_Index            10000 non-null  float64
 13  Adaptation_Strategies        10000 non-null  object
 14  Economic_Impact_Million_USD  10000 non-null  float64
dtypes: float64(9), int64(2), object(4)
memory usage: 1.1+ MB
None

Missing values in each column:
Year                          0
Country                       0
Region                        0
Crop_Type                     0
Average_Temperature_C         0
Total_Precipitation_mm        0
CO2_Emissions_MT              0
Crop_Yield_MT_per_HA          0
Extreme_Weather_Events        0
Irrigation_Access_%           0
Pesticide_Use_KG_per_HA       0
Fertilizer_Use_KG_per_HA      0
Soil_Health_Index             0
Adaptation_Strategies         0
Economic_Impact_Million_USD   0
dtype: int64
```


Temperature vs Crop Yield by Crop Type
Crop Type
Corn
Wheat
Coffee
Sugarcane
Fruits
Rice
Barley
Vegetables
Soybeans
Cotton
Crop Yield (MT/HA)
Average Temperature (°C)


Economic Impact by Crop Type
Economic Impact (Million USD)
Corn
Wheat
Coffee
Sugarcane
Fruits
Rice
Barley
Vegetables
Soybeans
Cotton
Crop Type

In [ ]:

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