 **temperature**:

* **Description**: The average temperature during the growing season.
* **Unit**: Degrees Celsius (°C)
* **Range**: 10°C to 40°C

 **rainfall**:

* **Description**: The total amount of rainfall received during the growing season.
* **Unit**: Millimeters (mm)
* **Range**: 100 mm to 1000 mm

 **soil\_quality**:

* **Description**: An index representing the quality of the soil, which affects crop growth.
* **Unit**: Integer scale
* **Range**: 1 to 10

 **fertilizer\_use**:

* **Description**: The amount of fertilizer applied to the crops.
* **Unit**: Kilograms per hectare (kg/ha)
* **Range**: 50 kg/ha to 300 kg/ha

 **humidity**:

* **Description**: The average relative humidity during the growing season.
* **Unit**: Percentage (%)
* **Range**: 30% to 90%

 **pesticide\_use**:

* **Description**: The amount of pesticide used on the crops.
* **Unit**: Kilograms per hectare (kg/ha)
* **Range**: 0 kg/ha to 50 kg/ha

 **sunlight\_hours**:

* **Description**: The total number of sunlight hours the crops received during the growing season.
* **Unit**: Hours
* **Range**: 1000 hours to 3000 hours

 **plant\_density**:

* **Description**: The number of plants per hectare.
* **Unit**: Plants per hectare
* **Range**: 5000 to 30000 plants/ha

 **irrigation**:

* **Description**: The total amount of irrigation water applied to the crops.
* **Unit**: Millimeters (mm)
* **Range**: 0 mm to 500 mm

 **crop\_type**:

* **Description**: The type of crop being grown. This is a categorical variable with several possible values.
* **Values**: 'Wheat', 'Corn', 'Soybean', 'Rice'

 **farm\_area**:

* **Description**: The total area of the farm where the crops are grown.
* **Unit**: Hectares (ha)
* **Range**: 1 ha to 100 ha

 **crop\_yield**:

* **Description**: The yield of the crop, which is the output of the crop production process.
* **Unit**: Tons per hectare (tons/ha)
* **Calculated as**: A combination of the above factors, including a linear relationship with added noise for realism.