

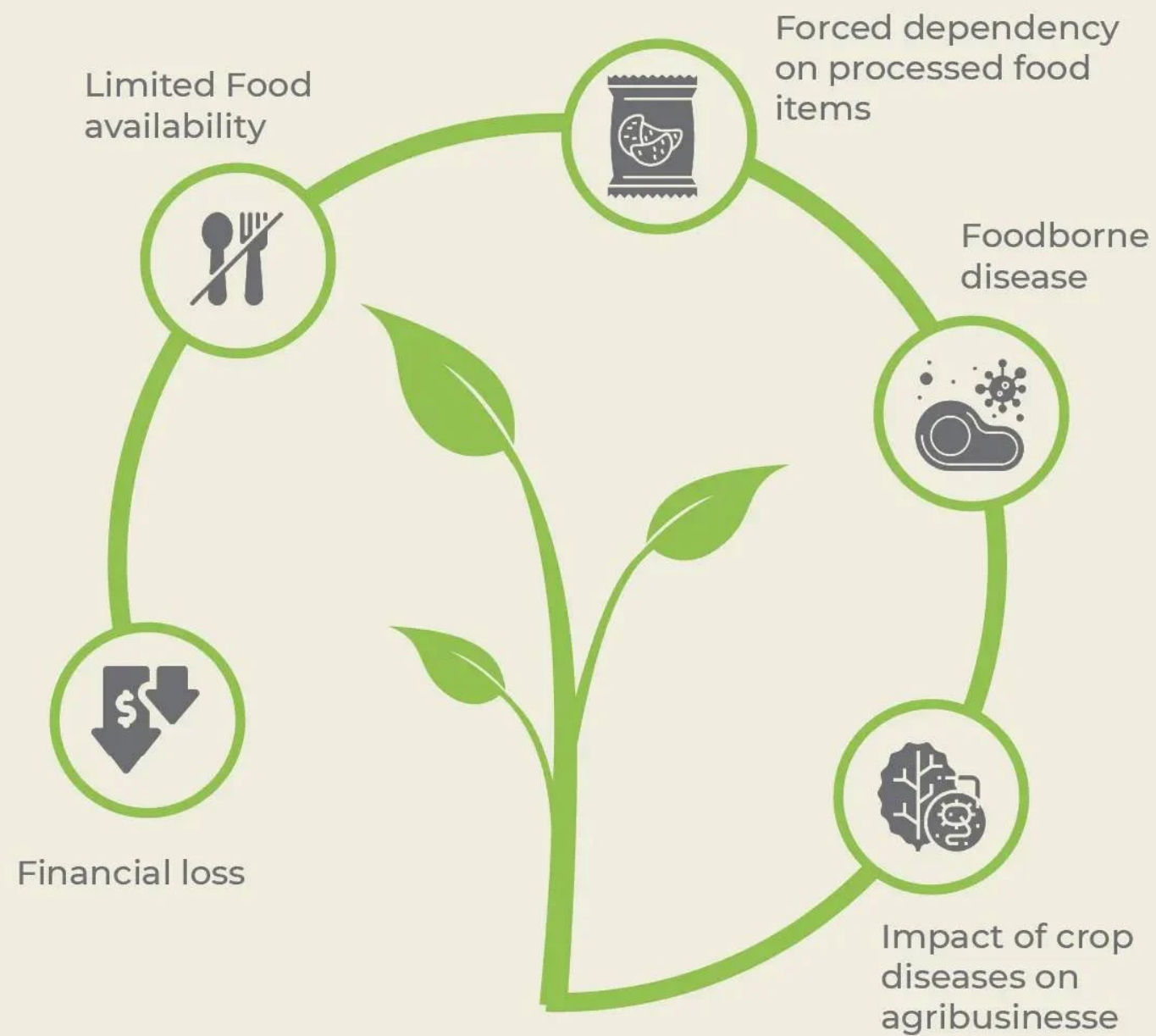
Leveraging Technology for
Sustainable Agriculture

Crop Disease Management System

Presented by:
Dinesh kumar raju kattunga
&
Puneeth kumar Amudala

Plant Diseases impacting cultivators and the consumers

Cropin



The Challenge in Agriculture

- Disease outbreaks cause significant yield losses globally.
- Farmers lack real-time insights into crop health and weather impacts.
- Inefficient pesticide use leads to environmental and economic issues.

What Does This System Aim to Solve?

- Predict diseases using weather and crop data.
- Recommend timely actions like irrigation or pesticide application.
- Support farmers in optimizing yield and reducing waste.



Crop Disease Management System Requirements

1. Crop Management
2. Disease Monitoring.
3. Irrigation Scheduling
4. Pesticide Management
5. Weather Conditions
6. Yield Prediction

Key tables and their relationships:

- **Crop Table:** Stores crop information (type, planting date).

CROP	
PK	<u>crop_id</u>
	type
	Growth Stage
	Planting date
	Disease resistance level

Key tables and their relationships:

- **Disease Table:** Records diseases and links to weather conditions and affected crops.

DISEASE	
PK	<u>disease_id</u>
	name
	symptoms
	severity_level
	treatment

Key tables and their relationships:

- **Weather Condition Table:** Defines temperature, humidity, and rainfall ranges that favor specific diseases.

WEATHER	
PK	<u>weather_data_id</u>
	temperature
	humidity
	rainfall
	windspeed

Key tables and their relationships:

- **Pesticide Table:** Provides pesticide recommendations and usage guidelines.

PESTICIDE	
PK	<u>pesticide_id</u>
	Name
	Pesticide_type
	Recommended_dosage
	application_date

Key tables and their relationships:

- **Yield Info Table:** Tracks crop yields, irrigation schedules, and pesticide applications.

YEILD_INFO	
PK	<u>yeild_id</u> (PK)
	yeild_amount
	irrigation_schedule
	date

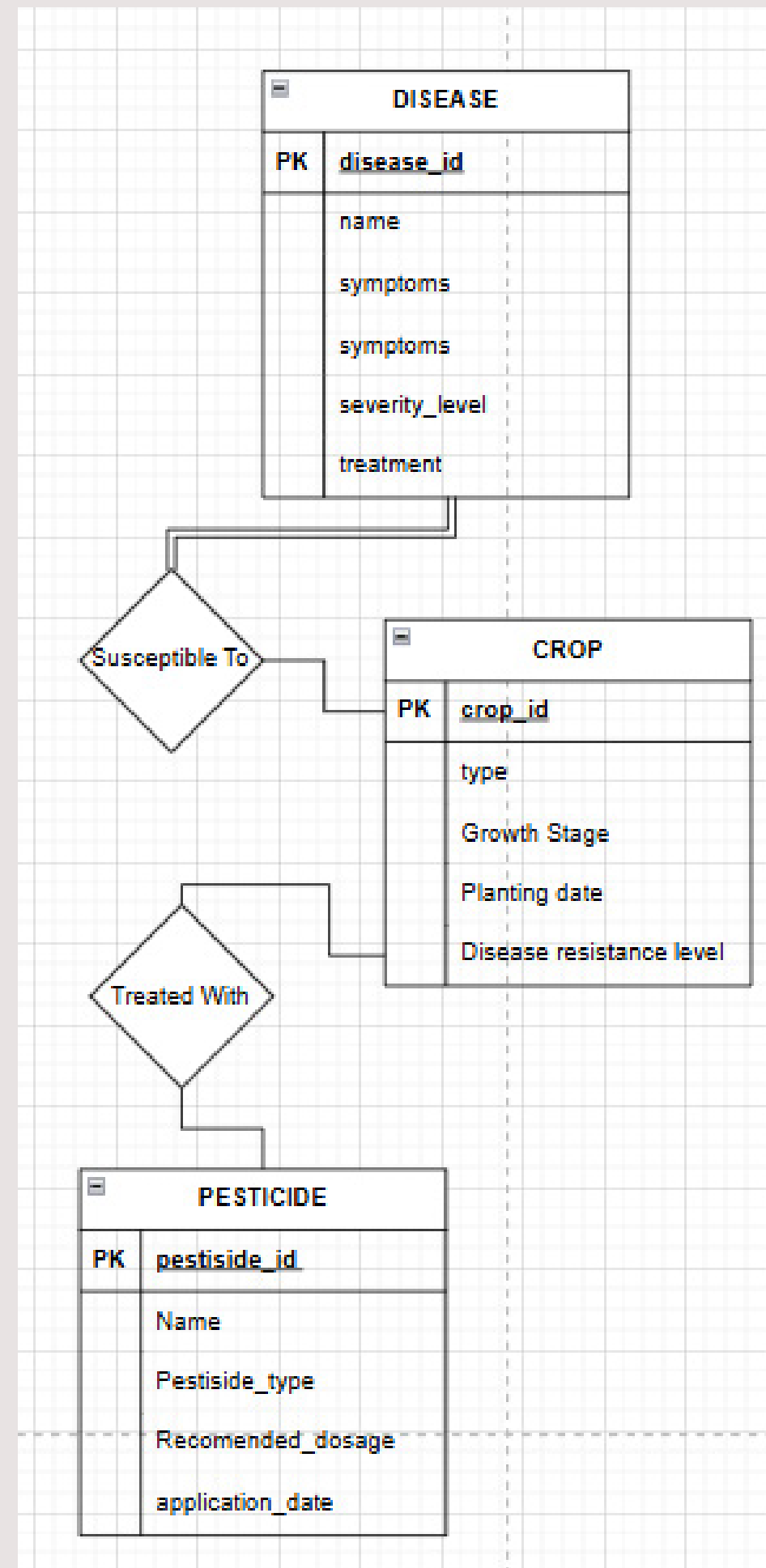
Key tables and their relationships:

- **Irrigation Schedule Table:** Logs irrigation dates and water requirements tailored to crop needs.

IRRIGATION_SCHEDULE	
PK	<u>schedule_id (PK)</u>
	crop_id
	frequency
	duration
	water_volume

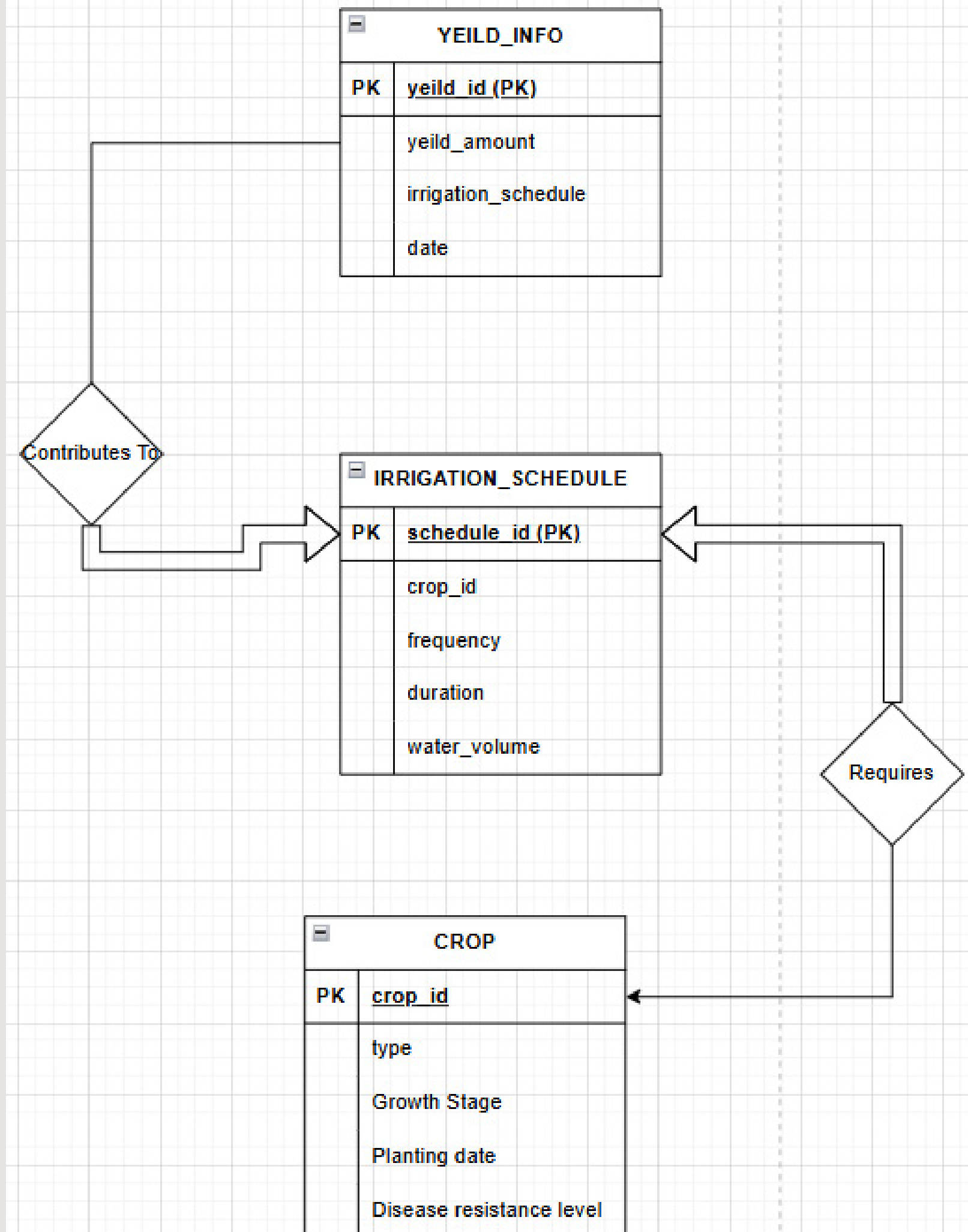
Key relationships:

- Crops are inked to diseases and Pesticides



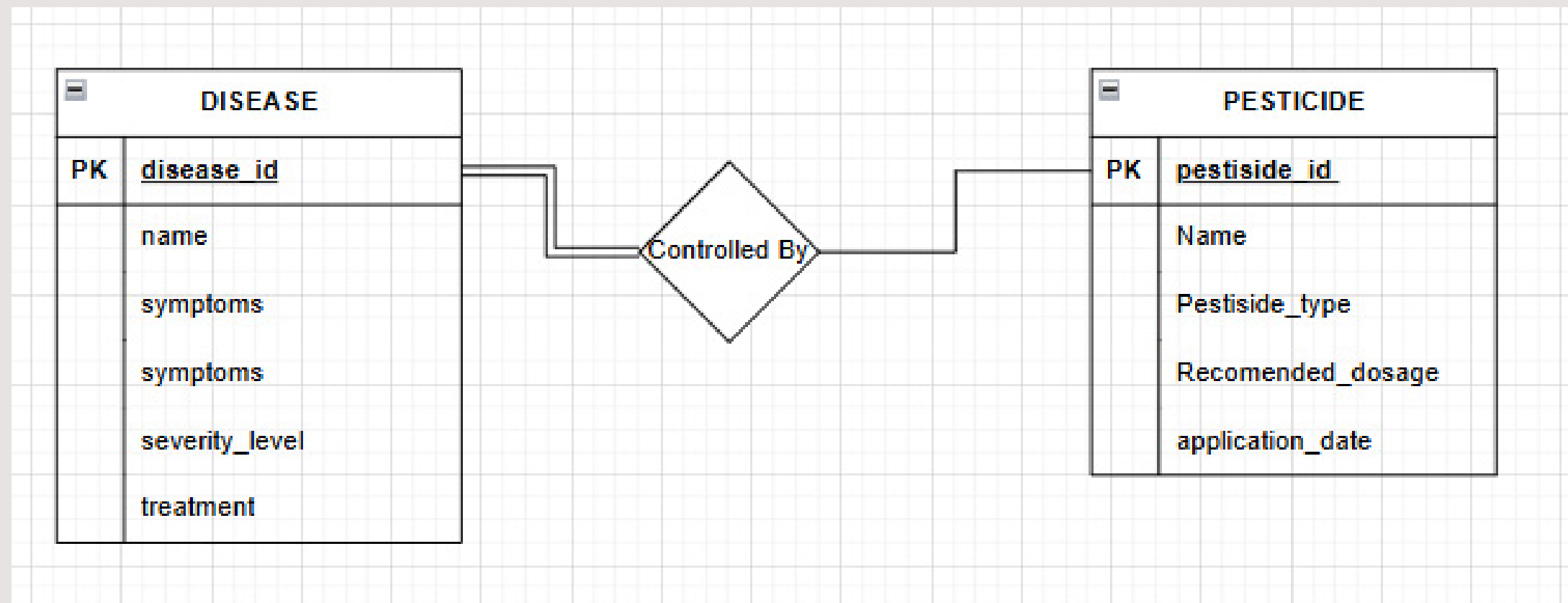
Key relationships:

- Irrigation schedules directly impact the yield outcomes and are linked to specific crops.



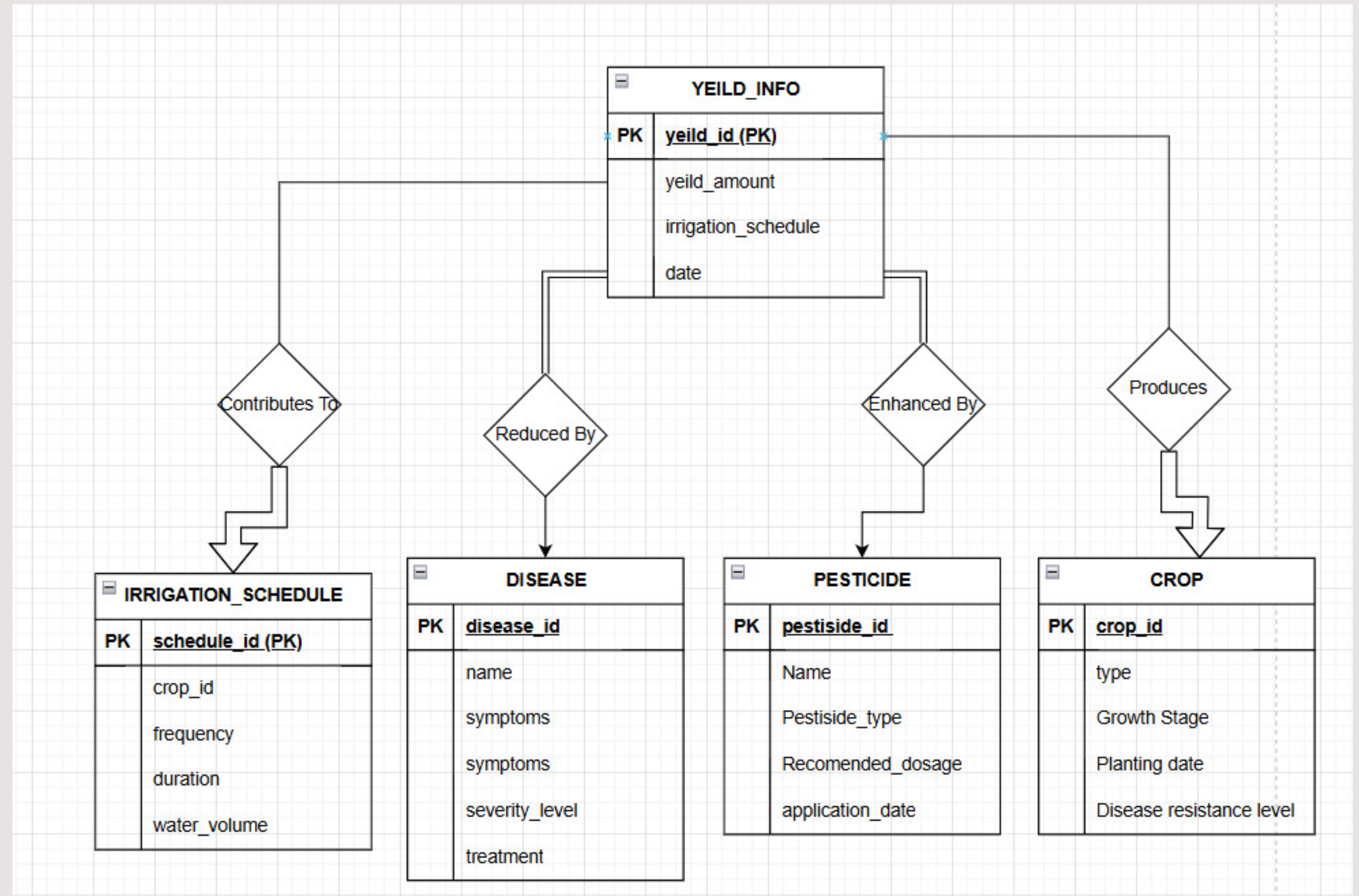
Key relationships:

- **Pesticides** are associated with diseases to recommend preventive or corrective measures.

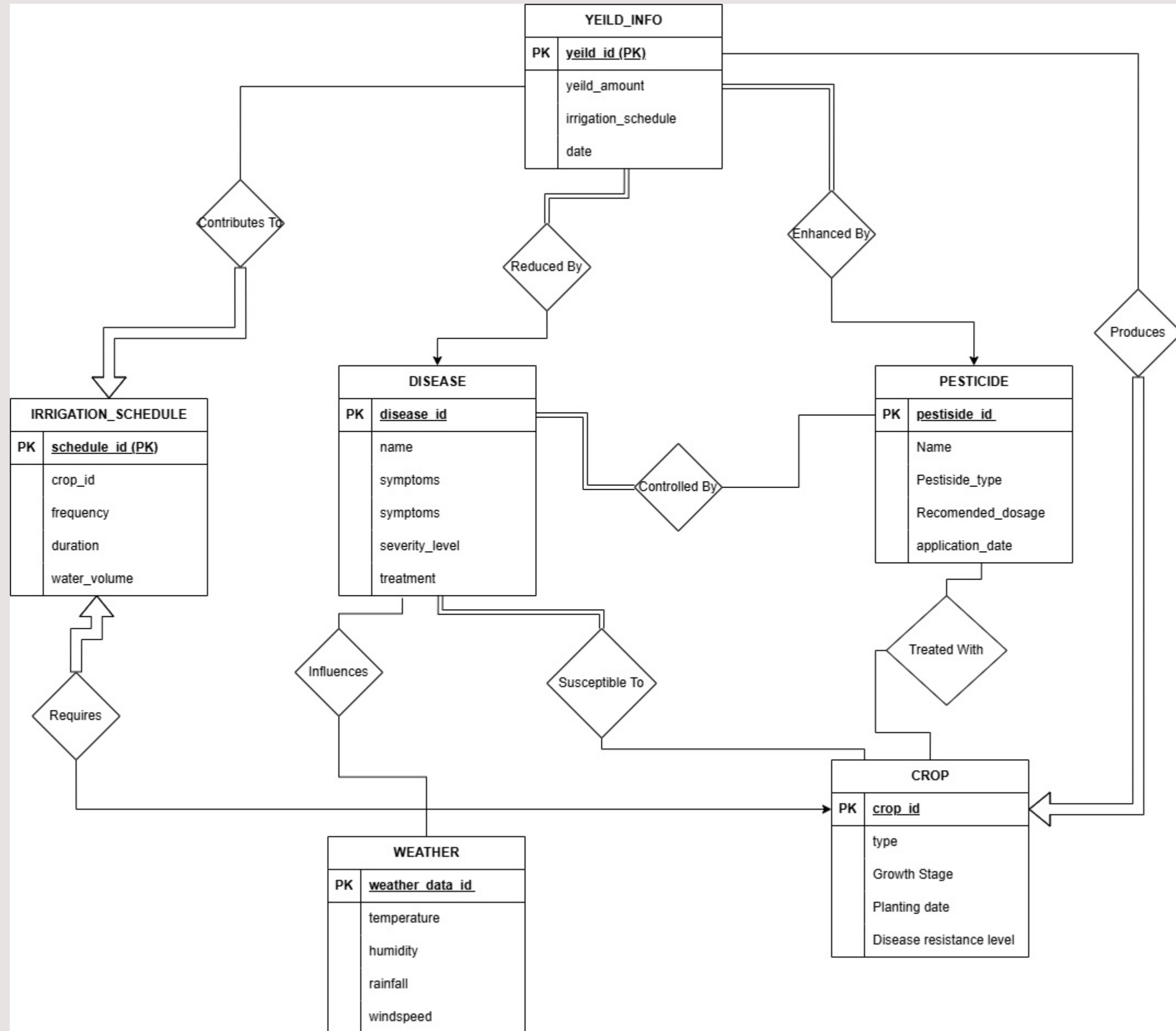


Key relationships:

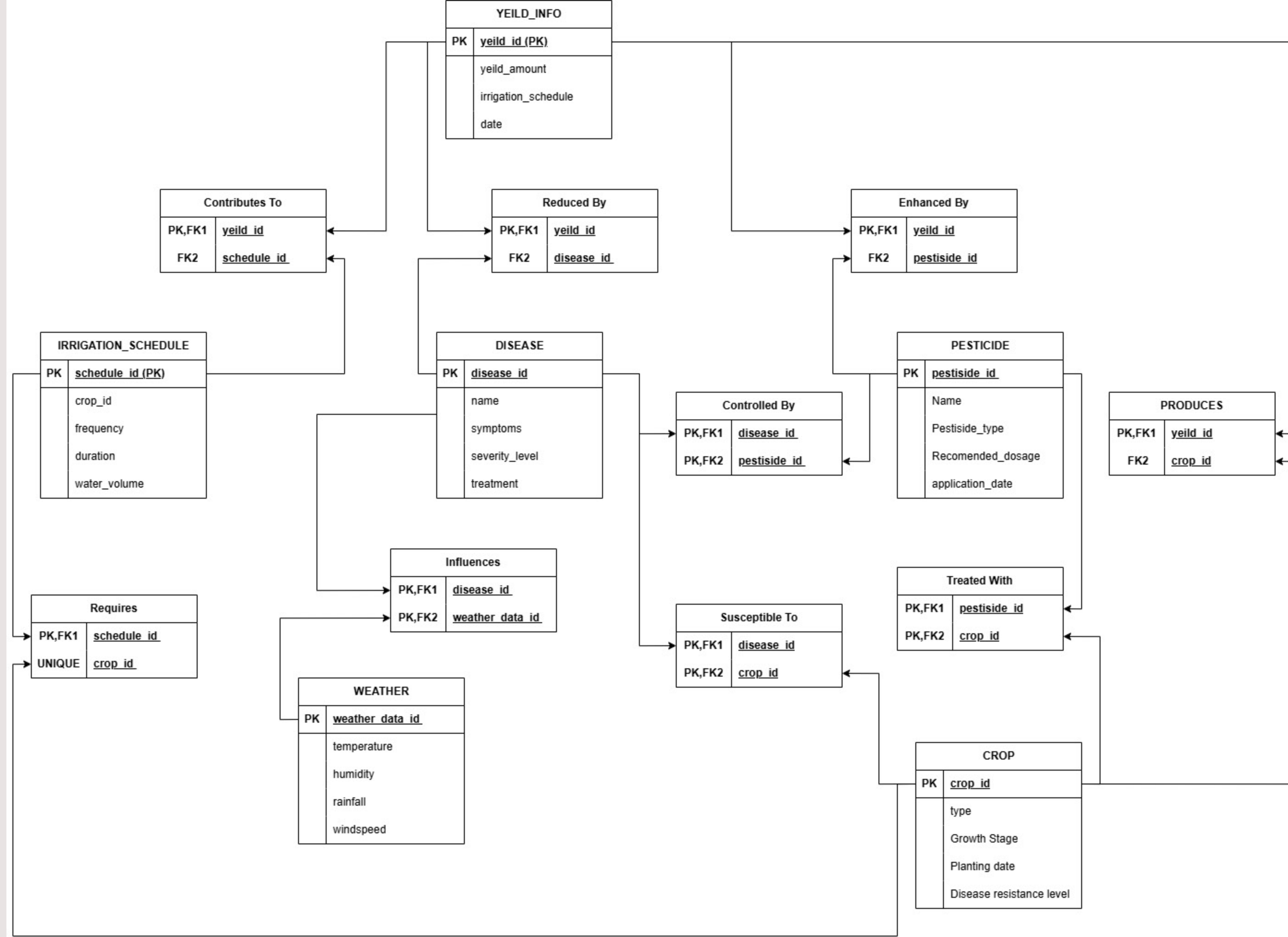
- Yield Info consolidates data from crop type, irrigation, and pesticide application.



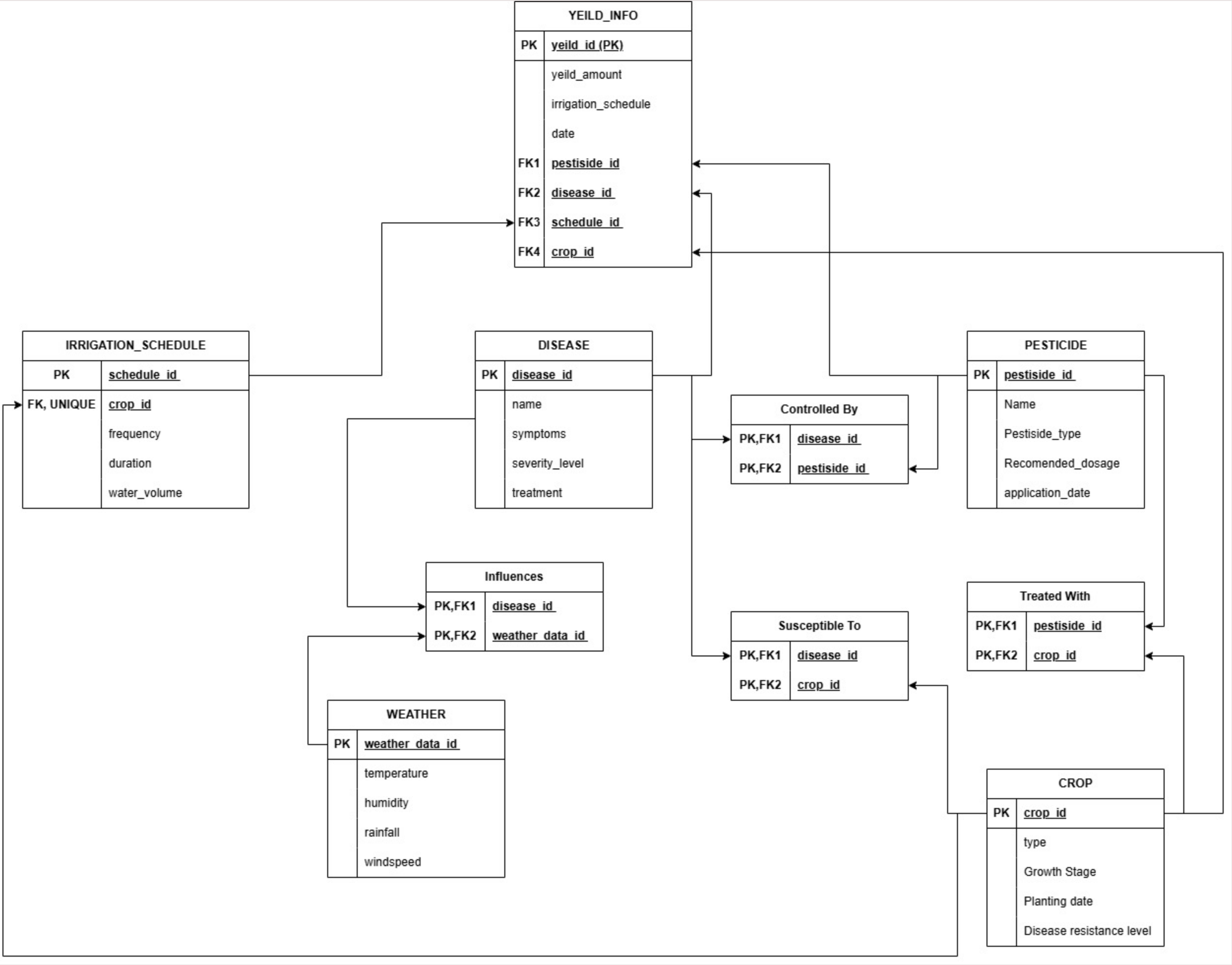
Entity relationship diagram:



Relationship Schema without Reduction:



Relationship Schema diagram with Reduction:



Implementing on MY SQL

```
CREATE TABLE Crop (  
  CropID VARCHAR(50) PRIMARY KEY,  
  Type VARCHAR(100),  
  PlantingDate DATE,  
  DiseaseResistanceLevel VARCHAR(50),  
  AverageYield FLOAT  
);
```

```
-- 5. Crop_Disease Table  
CREATE TABLE Crop_Disease (  
  CropID VARCHAR(50),  
  DiseaseID VARCHAR(50),  
  PRIMARY KEY (CropID, DiseaseID),  
  FOREIGN KEY (CropID) REFERENCES  
  Crop(CropID)  
  ON DELETE CASCADE,  
  FOREIGN KEY (DiseaseID) REFERENCES  
  Disease(DiseaseID)  
  ON DELETE CASCADE  
);
```

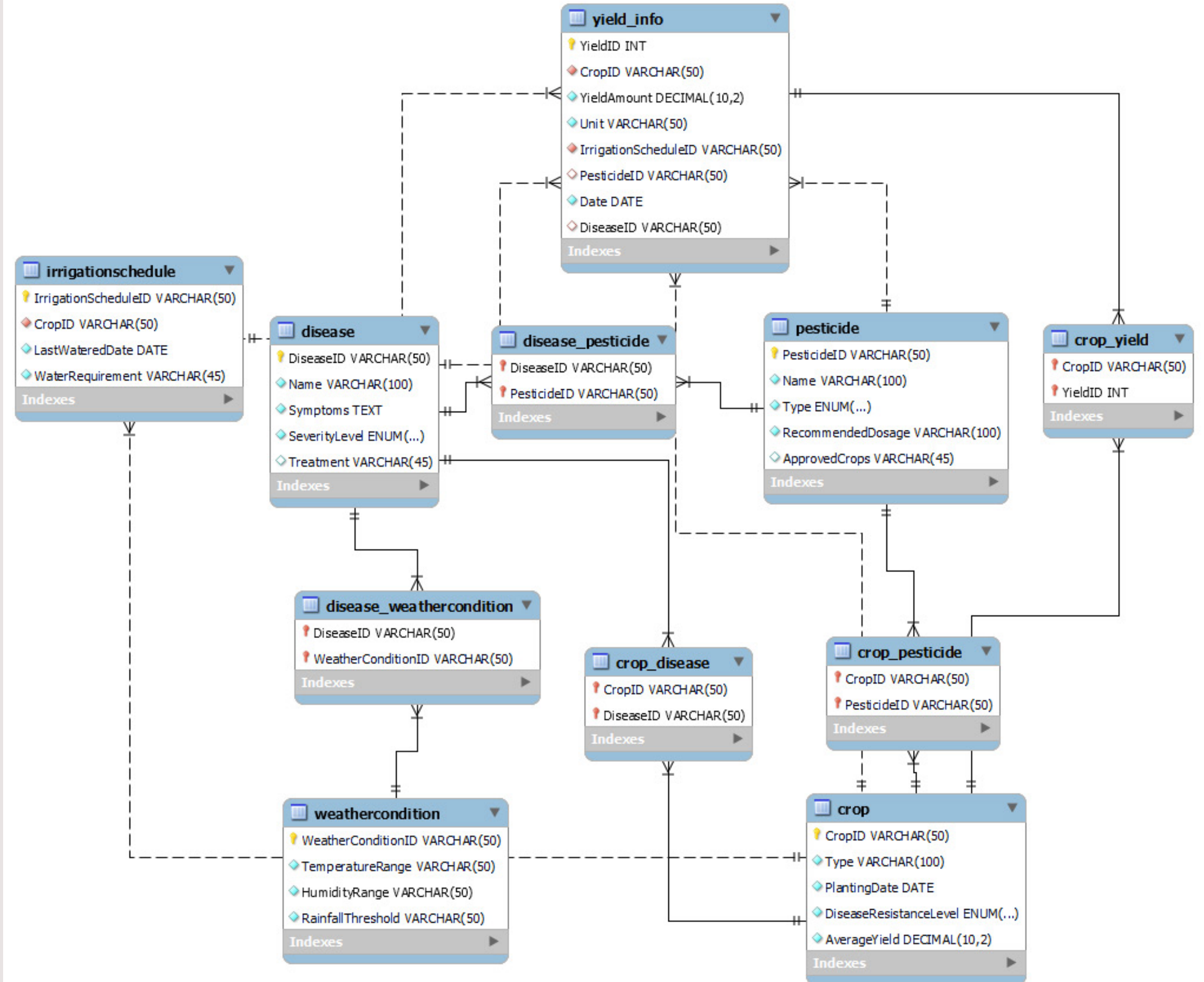
```
-- 2. Disease Table  
CREATE TABLE Disease (  
  DiseaseID VARCHAR(50) PRIMARY KEY,  
  Name VARCHAR(100),  
  Symptoms TEXT,  
  SeverityLevel VARCHAR(50),  
  Treatment TEXT  
);
```

```
INSERT INTO Crop (CropID, Type, PlantingDate,  
DiseaseResistanceLevel,  
AverageYield) VALUES  
( 'C001', 'Wheat', '2024-01-15', 'High', '4000'),  
( 'C002', 'Rice', '2024-02-10', 'Medium', '6000'),  
( 'C003', 'Maize', '2024-03-05', 'Medium', '5000'),  
( 'C004', 'Soybean', '2024-04-01', 'High', '3000'),  
( 'C005', 'Tomato', '2024-05-01', 'Low', '7000'),  
( 'C006', 'Potato', '2024-06-01', 'Medium', '25000'),  
( 'C007', 'Cotton', '2024-02-15', 'High', '1500'),
```

```
INSERT INTO Crop_Disease (CropID, DiseaseID) VALUES  
( 'C001', 'D001'), -- Wheat and Blight  
( 'C002', 'D002'), -- Rice and Brown Spot  
( 'C003', 'D003'), -- Maize and Northern Leaf Blight  
( 'C004', 'D004'), -- Soybean and Soybean Rust  
( 'C005', 'D005'), -- Tomato and Late Blight  
( 'C006', 'D006'), -- Potato and Early Blight  
( 'C007', 'D007'), -- Cotton and Leaf Curl Virus  
( 'C008', 'D008'), -- Sugarcane and Red Rot  
( 'C009', 'D009'), -- Barley and Powdery Mildew  
( 'C010', 'D010'); -- Sunflower and Downy Mildew
```

```
INSERT INTO Disease (DiseaseID, Name, Symptoms,  
SeverityLevel, Treatment) VALUES  
( 'D001', 'Blight', 'Yellowing, Wilting', 'High', 'Bligh  
( 'D002', 'Brown Spot', 'Brown spots on leaves', 'Medium  
( 'D003', 'Northern Leaf Blight', 'Dark streaks on leave  
( 'D004', 'Soybean Rust', 'Orange-brown spots', 'Medium'  
( 'D005', 'Late Blight', 'Dark spots on stems and leaves  
( 'D006', 'Early Blight', 'Brown lesions on leaves', 'Me  
( 'D007', 'Leaf Curl Virus', 'Curled leaves', 'Low', 'Cu
```


Implementing on MY SQL



Stored Procedures:

- **Disease alert:** Returns a disease based on crop, temperature, Humidity and Rainfall

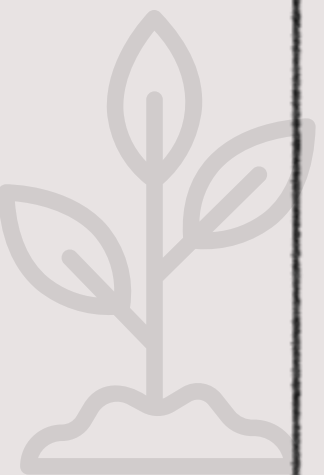
Call stored procedure cropdiseasemanagement.DiseaseAl... — □ ×

Enter values for parameters of your procedure and click <Execute> to create an SQL editor and run the call:

CropID	<input type="text" value="C002"/>	[IN] VARCHAR(50)
CurrentTemperature	<input type="text" value="25"/>	[IN] DECIMAL(5,2)
CurrentHumidity	<input type="text" value="85"/>	[IN] DECIMAL(5,2)
CurrentRainfall	<input type="text" value="15"/>	[IN] DECIMAL(5,2)



Result Grid		Filter Rows:
	Predicted_Disease	
▶	Blight	



Stored Procedures:

- **Yeild prediction:** Returns a disease based on crop, temperature, Humidity and Rainfall

Call stored procedure cropdiseasemanagement.PredictYi... — □ ×

Enter values for parameters of your procedure and click <Execute> to create an SQL editor and run the call:

CropID	<input type="text" value="C003"/>	[IN] VARCHAR(50)
CurrentIrrigation	<input type="text" value="10"/>	[IN] DECIMAL(10,2)
Temperature	<input type="text" value="28"/>	[IN] DECIMAL(5,2)



Result Grid		Filter R
	Predicted_Yield	
▶	5000.00	

Stored Procedures:

- **Recomending Pesticide:** Recomend Pesticides based on the disease

Call stored procedure cropdiseasemanagement.Recomm...

Enter values for parameters of your procedure and click <Execute> to create an SQL editor and run the call:

DiseaseID [IN] VARCHAR(50)



Result Grid		Filter Rows:
	Recommended_Pesticide	
▶	BlightShield	

Thank You