Leveraging Technology for Sustainable Agriculture

Crop Disease Management System

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&
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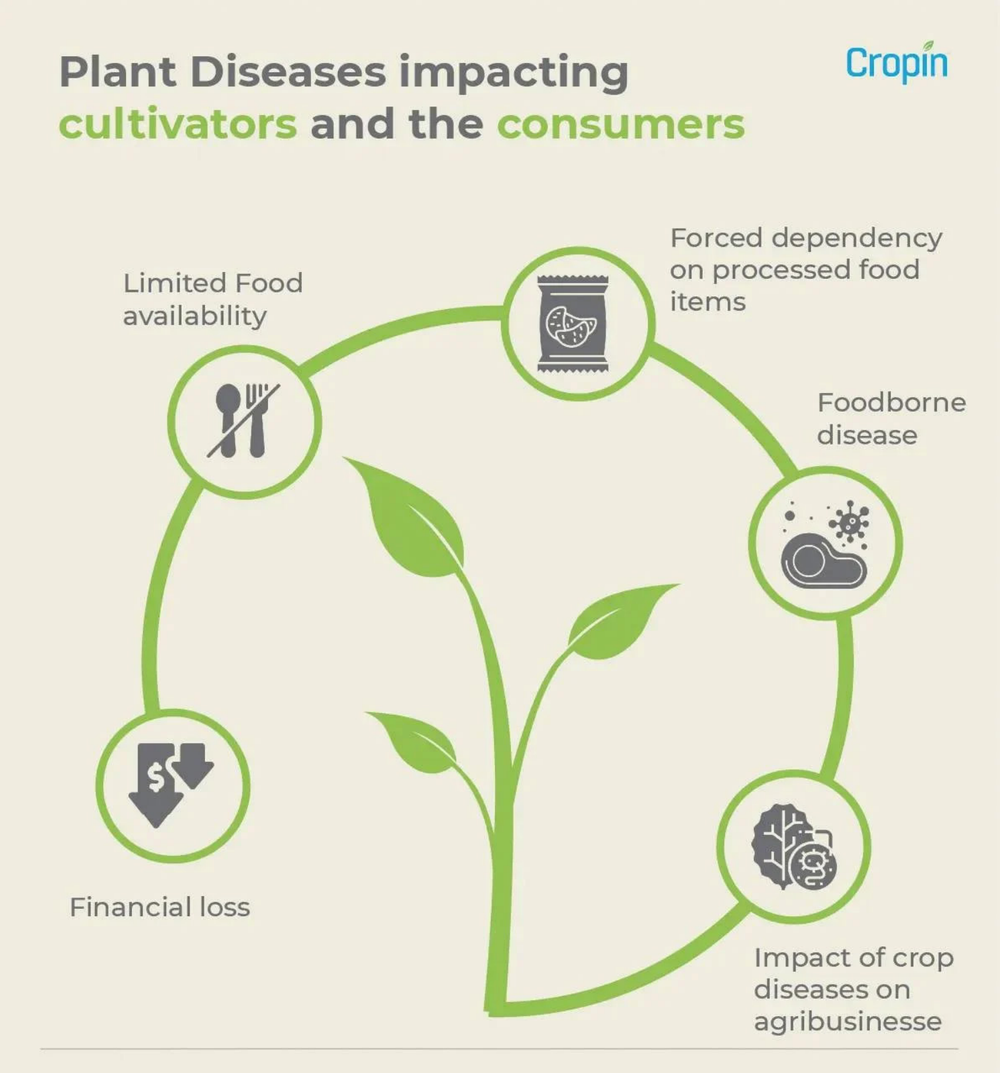


The Challenge in Agriculture

- 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?

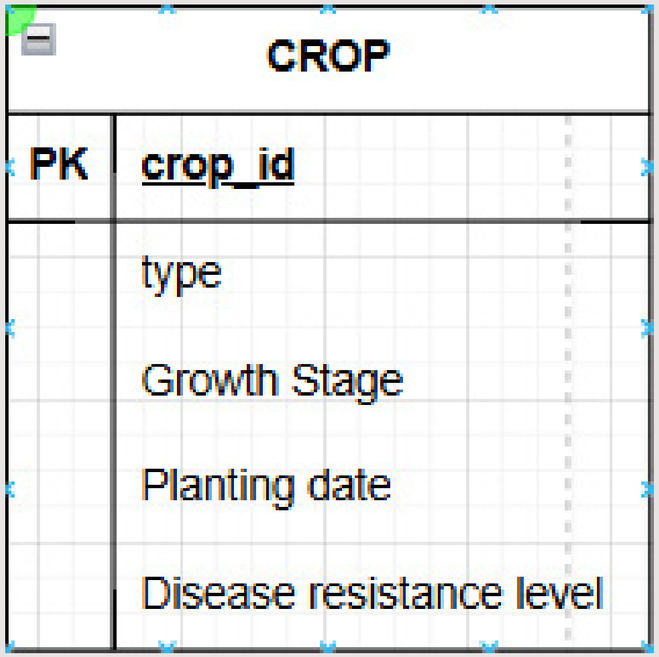
- Predict diseases using weather and crop data.
- Recommend timely actions like irrigation or pesticide application.
- Support farmers in optimizing yield and reducing waste.

Crop Disease Management System Requirements

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

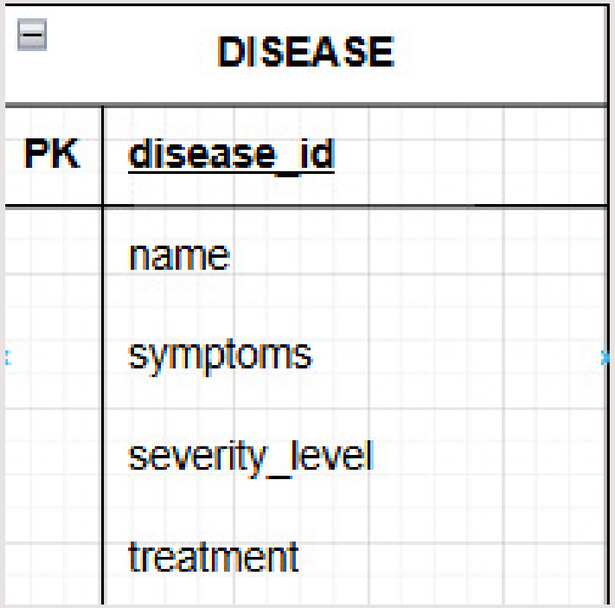
Key tables and their relationships:

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



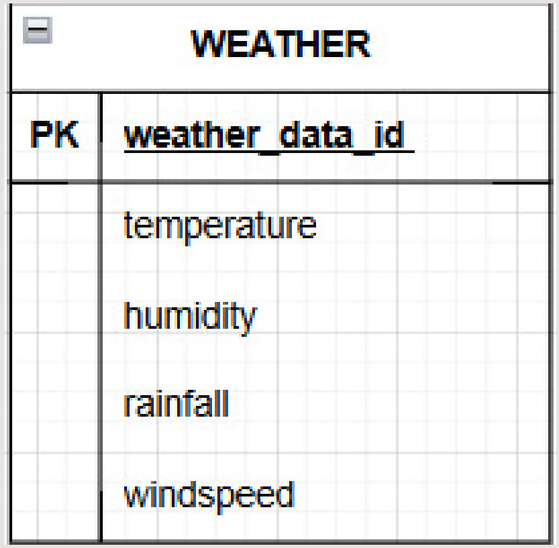
Key tables and their relationships:

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



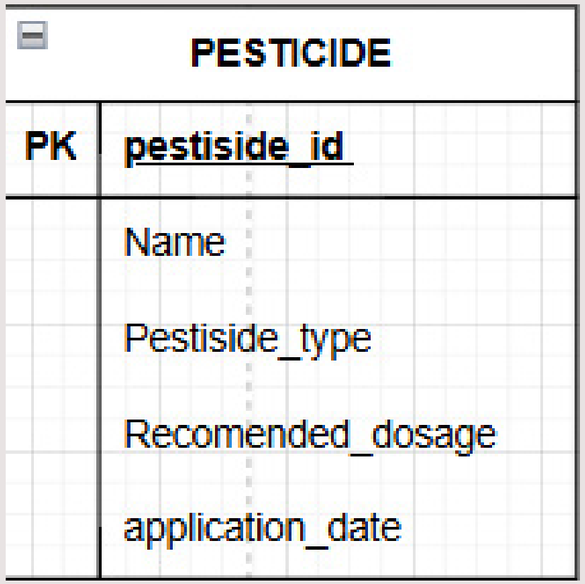
Key tables and their relationships:

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



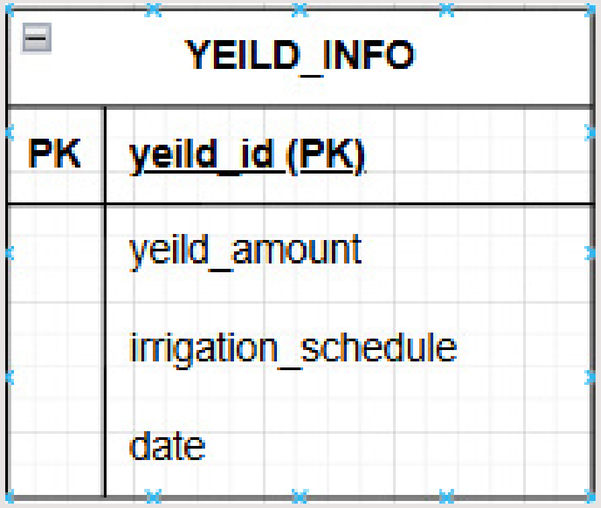
Key tables and their relationships:

- **Pesticide Table:** Provides pesticide recommendations and usage guide ines.



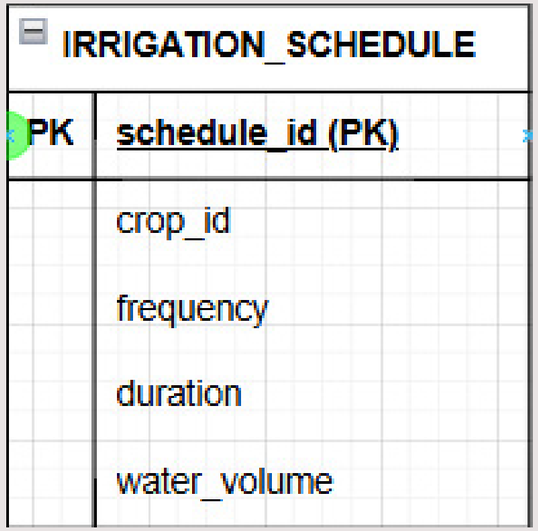
Key tables and their relationships:

- **Yield Info Table:** Tracks crop yie ds, irrigation schedu es, and pesticide app ications.



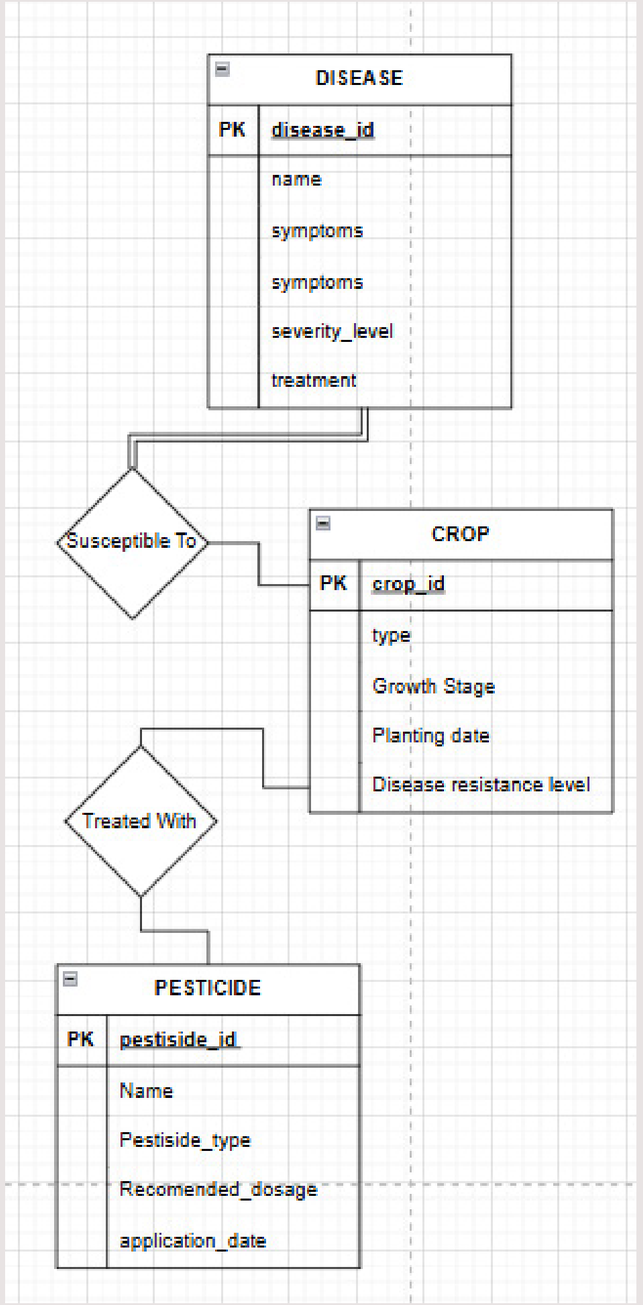
Key tables and their relationships:

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



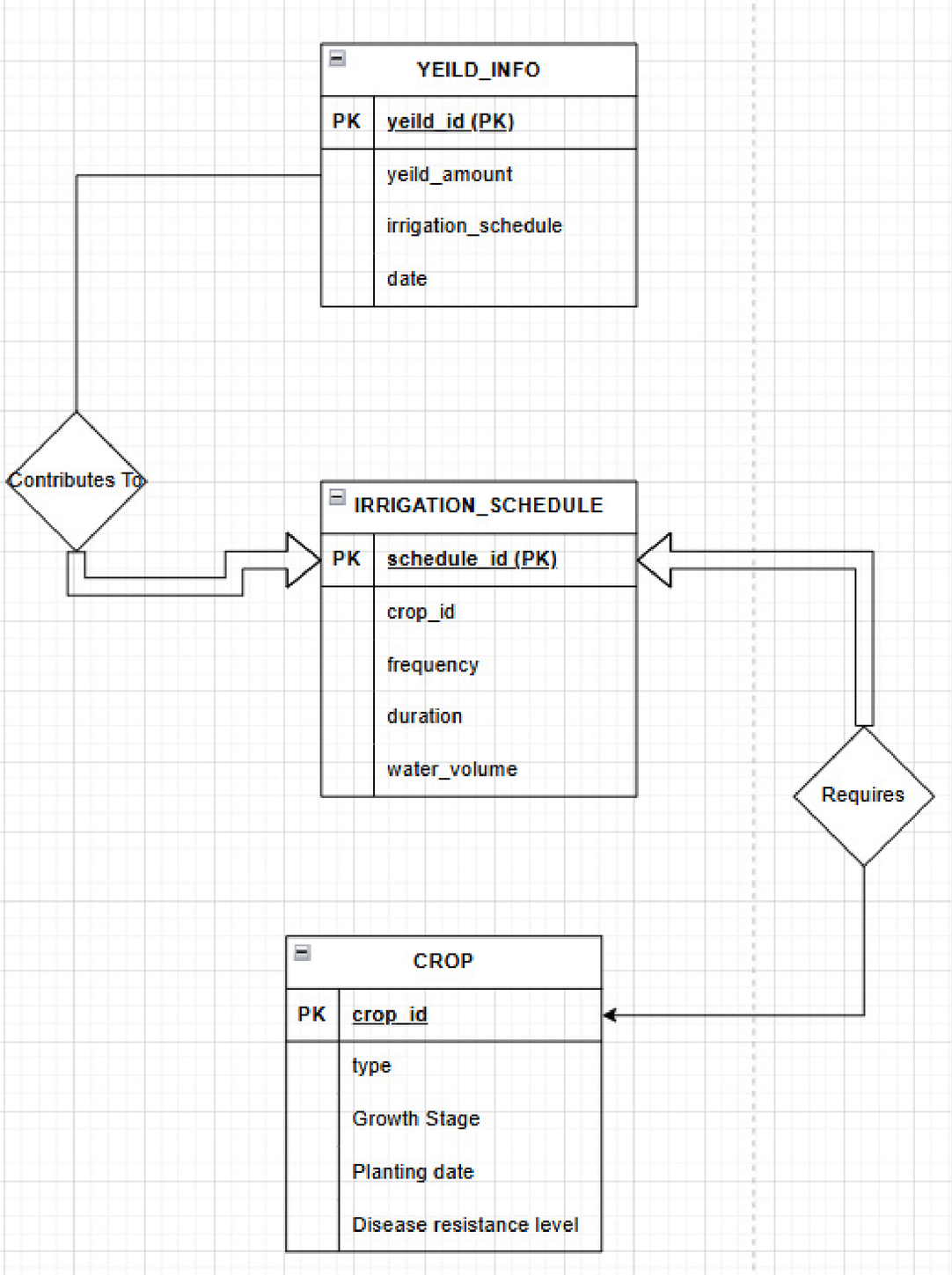
Key relationships:

- **Crops** are inked to **diseases** and **Pesticides**



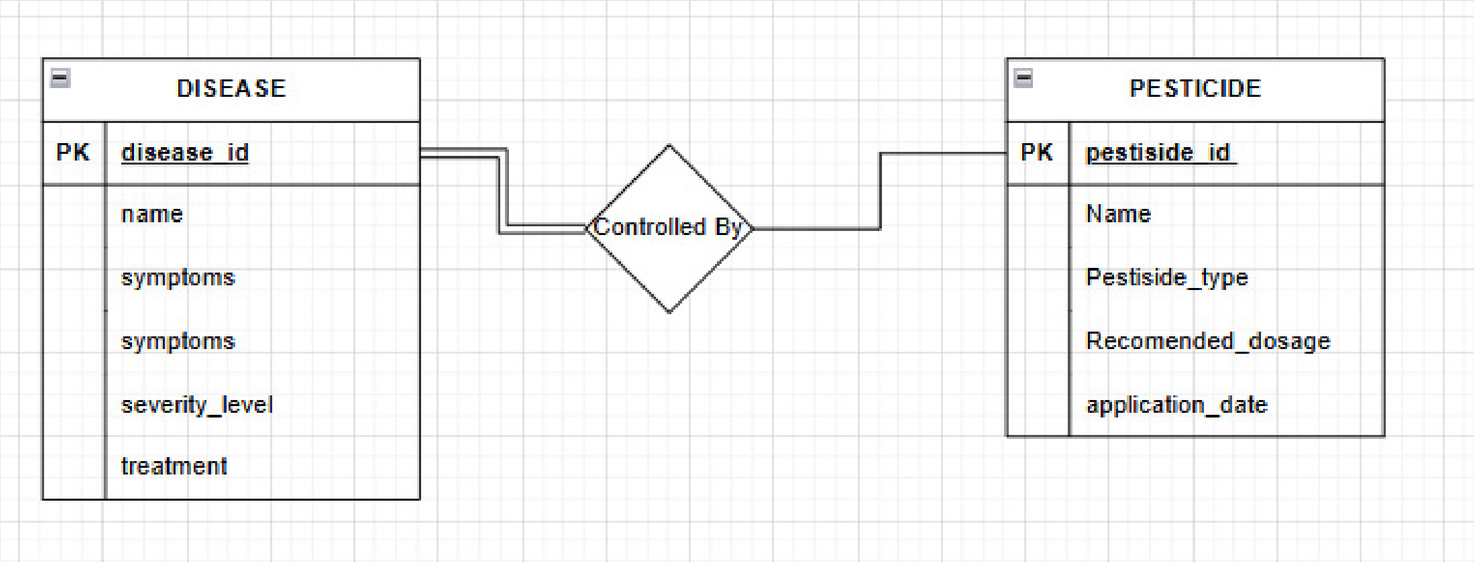
Key relationships:

- **Irrigation schedules** direct y impact the **yield** outcomes and are inked to specific crops.



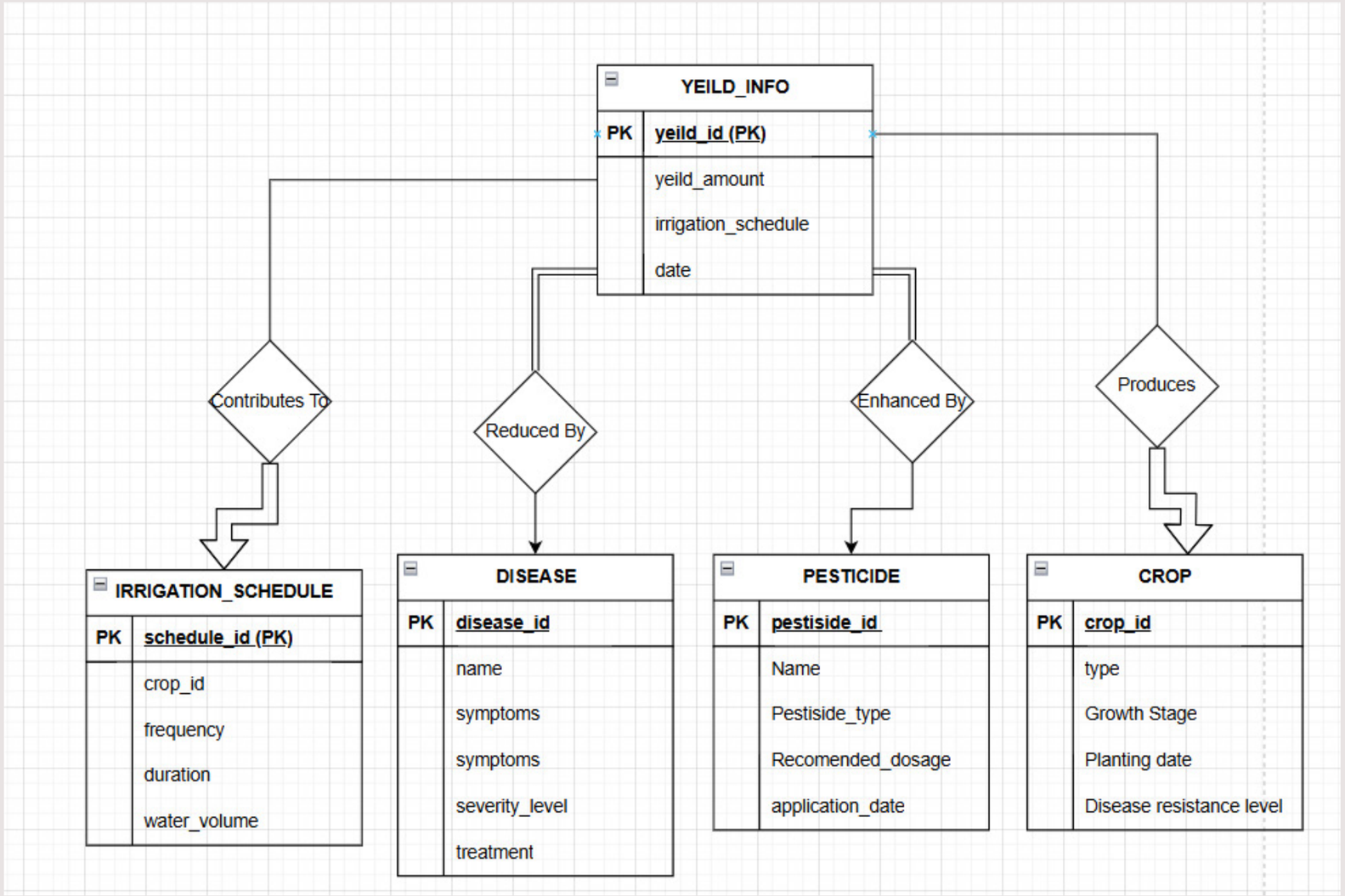
Key relationships:

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

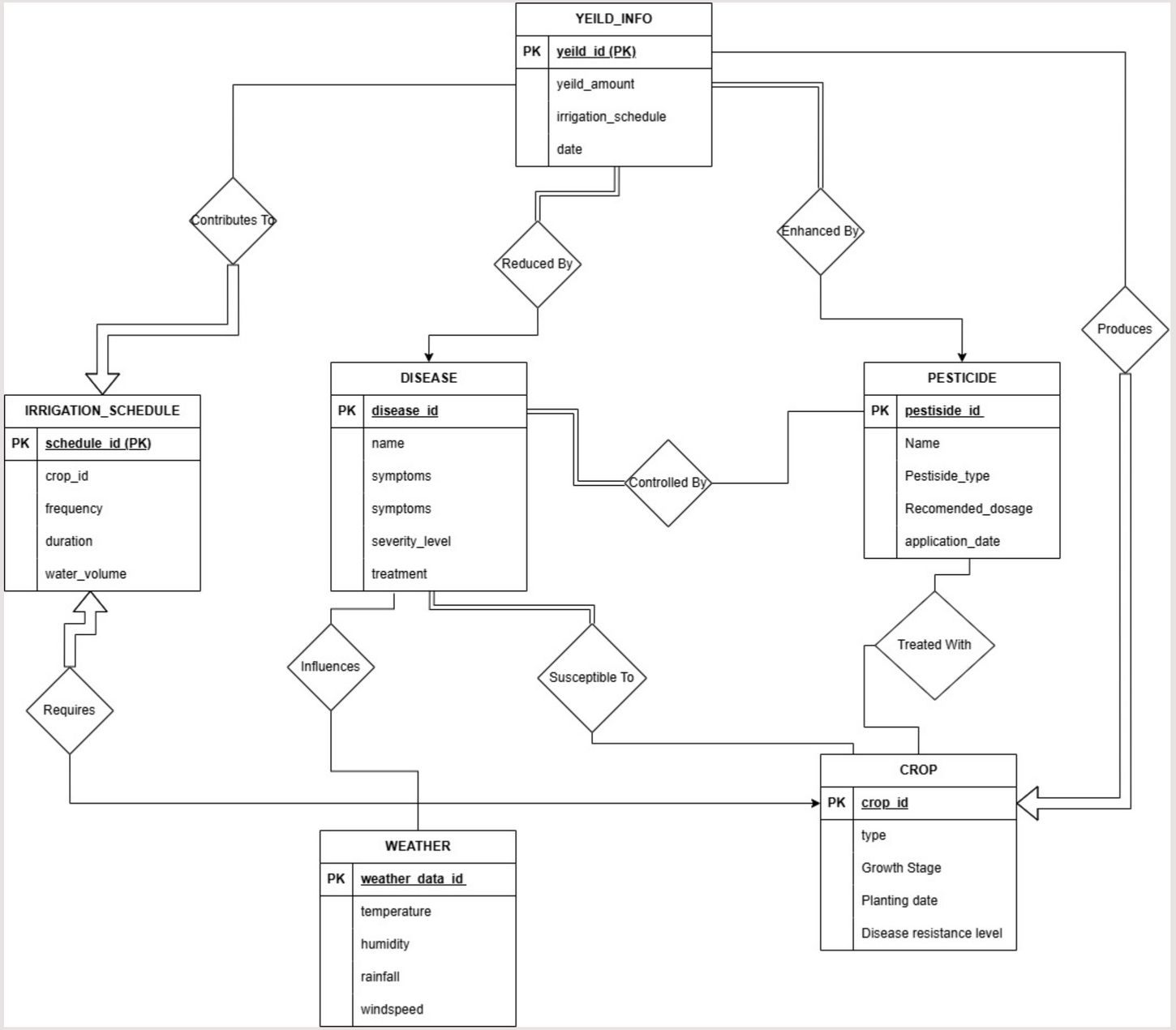


Key relationships:

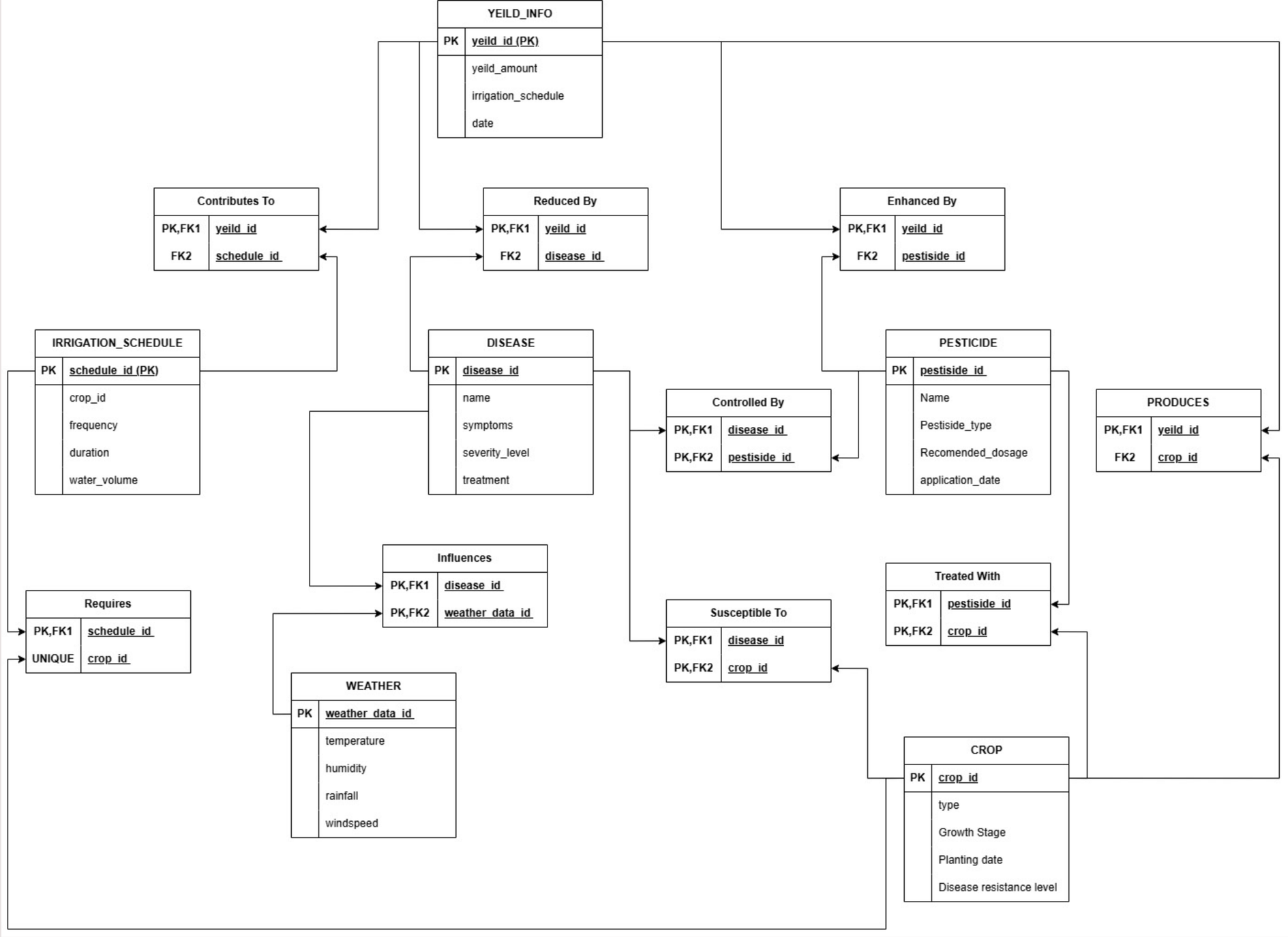
- **Yield Info consolidates data from crop type, irrigation, and pesticide application.**



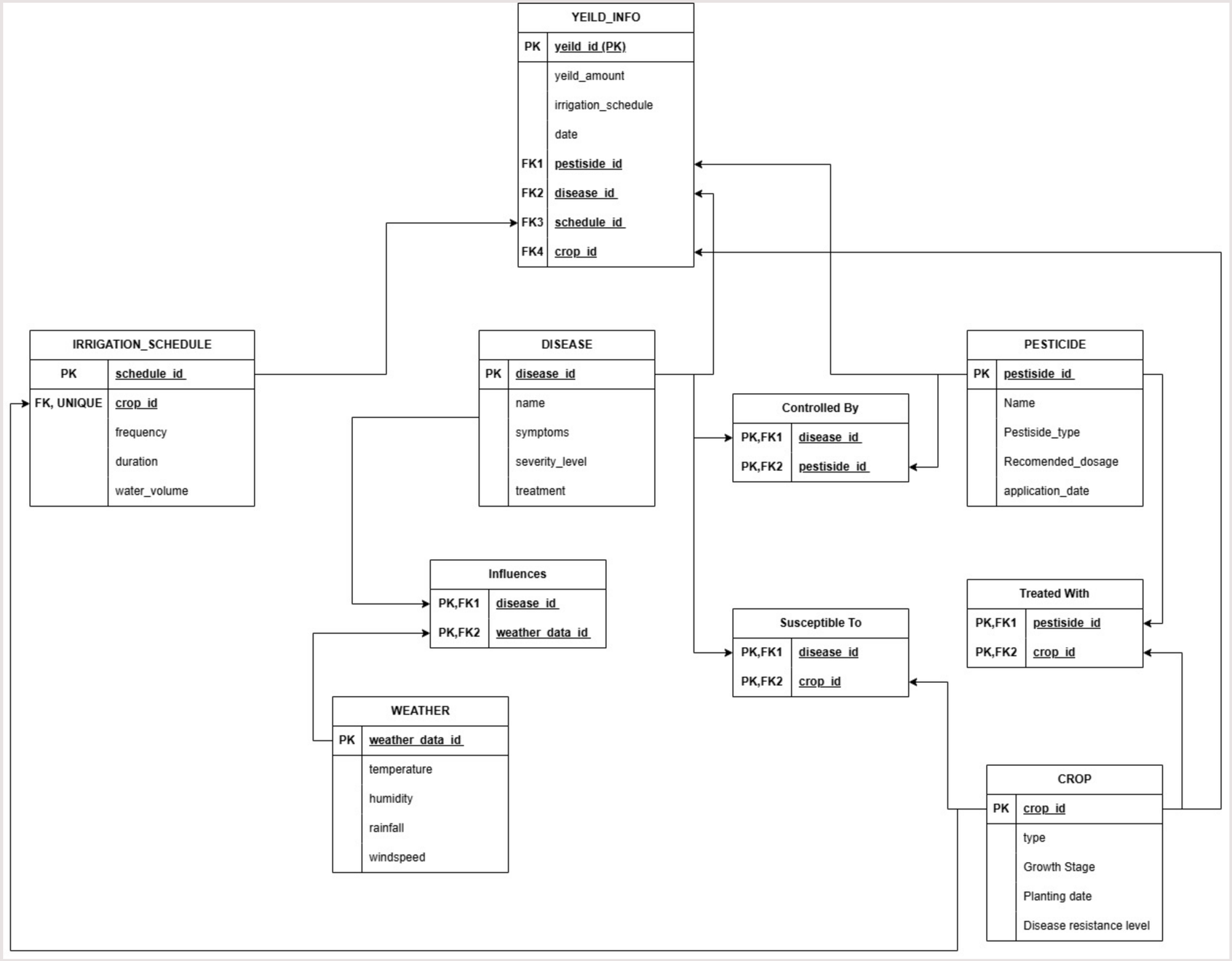
Entity relationship diagram:



Relationship Schema without Reduction:



Relationship Schema diagram with Reduction:



Implementing on MY SQL

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

```sql
-- 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
);
```

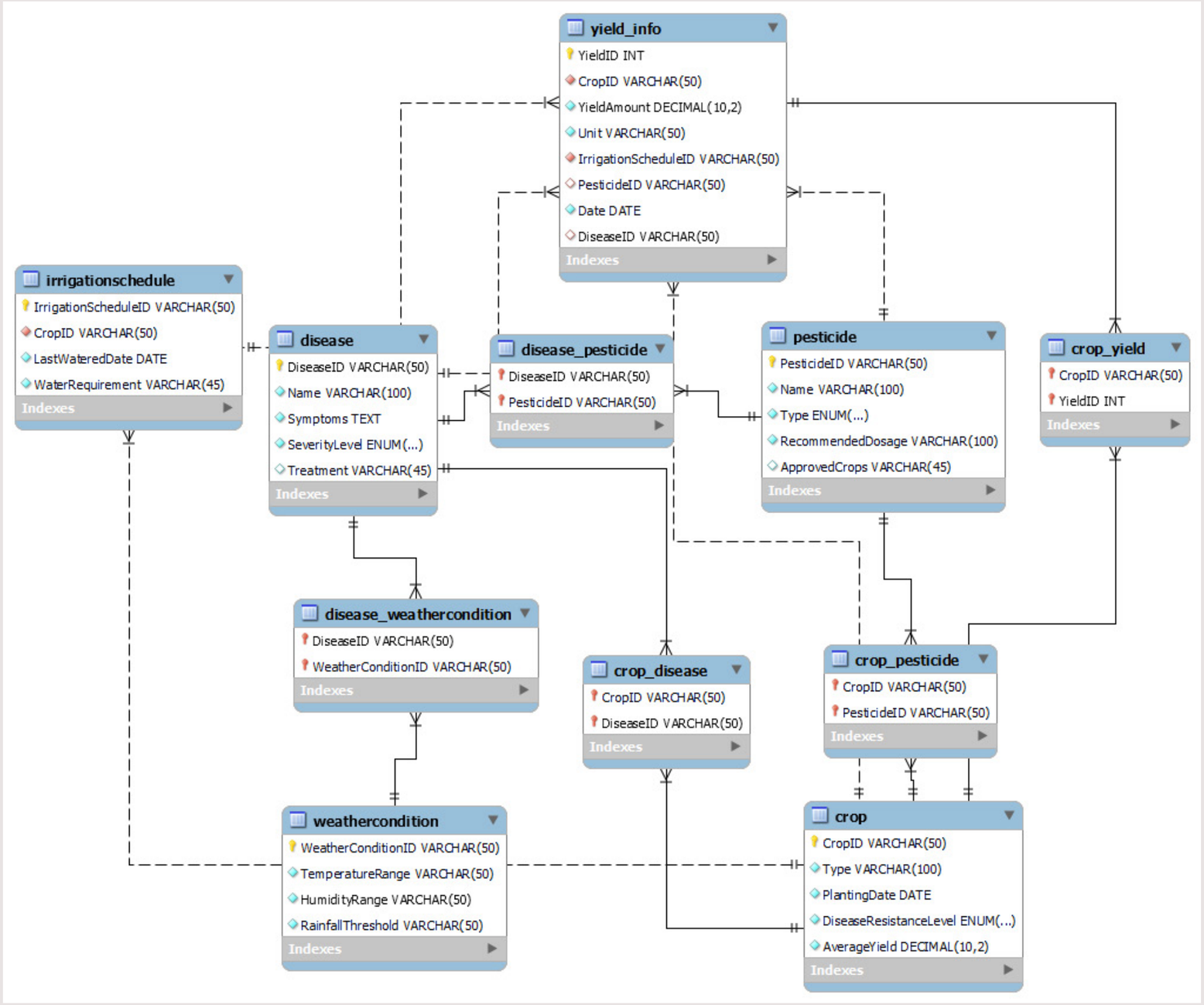
```sql
-- 2. Disease Table
CREATE TABLE Disease (
    DiseaseID VARCHAR(50) PRIMARY KEY,
    Name VARCHAR(100),
    Symptoms TEXT,
    SeverityLevel VARCHAR(50),
    Treatment TEXT
);
```

```sql
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'),
```

```sql
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
```

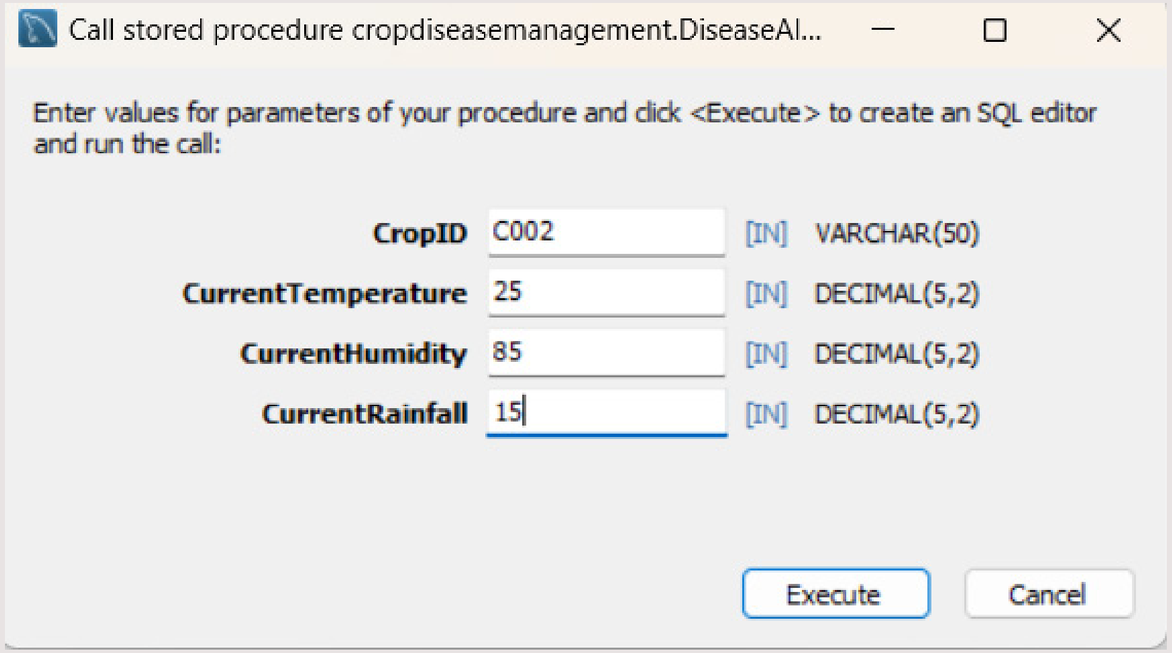
```sql
INSERT INTO Disease (DiseaseID, Name, Symptoms,
SeverityLevel, Treatment) VALUES
('D001', 'Blight', 'Yellowing, Wilting', 'High', 'Bligh
('D002', 'Brown Spot', 'Brown spots on leaves', 'Medium
('D003', 'Northern Leaf Blight', 'Dark streaks on leave
('D004', 'Soybean Rust', 'Orange-brown spots', '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



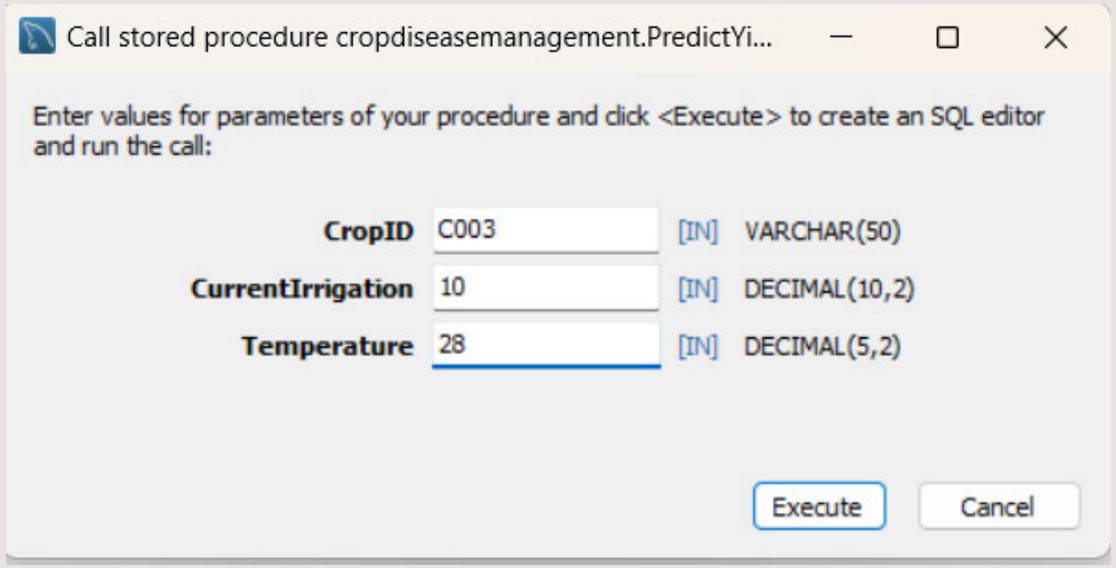
Stored Procedures:

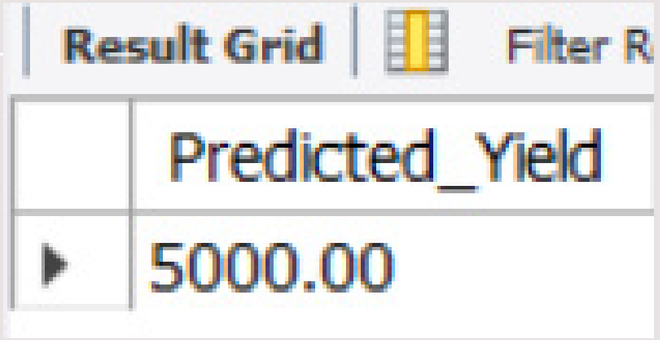
- **Disease alert: Returns a disease based on crop, temperature,Humidity and Rainfall**



Stored Procedures:

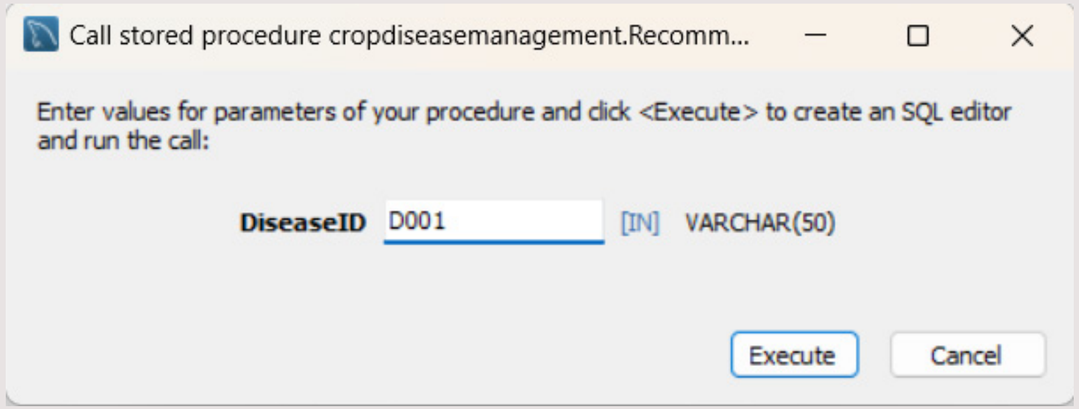
- **Yeild predictiont: Returns a disease based on crop, temperature,Humidity and Rainfall**





Stored Procedures:

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



Thank You