**Farm Yield Optimization – Results Summary**

**objective**

The SQL analysis of the farm database provided valuable insights into crop performance, irrigation efficiency, and resource management across multiple plots.

**1. Top Productive Plots**

* The **top three plots** by average yield were:
  1. *High Plains (Corn) – 2300.20 kg*
  2. *Plot A (Corn) – 2175.05 kg*
  3. *North Pasture (Corn) – 2050.25 kg*
* Corn plots demonstrated consistently higher yields compared to other crops.

**2. Water Consumption Ranking**

* **Plot A** consumed the most water (*158,000 L*), followed by *North Pasture (147,000 L)* and *High Plains (138,000 L)*.
* *Plot B* had the lowest water use (*48,000 L*), indicating significant differences in irrigation needs across plots.

**3. Crop Yield under Weather Conditions**

* **Corn** performed strongly across weather conditions, with slightly higher yields under *Sunny* conditions (2183.47 kg) compared to *Rainy* (2137.71 kg).
* **Wheat** yields were highest in *Sunny* weather (1487.70 kg).
* **Soybeans** had lower yields overall (876.22 kg), with limited weather variation.

**4. Highest-Yielding Plots by Soil Type**

* *North Pasture (Clay) – 6150.75 kg* was the top-performing clay soil plot.
* *East Meadow (Loam) – 4700.30 kg* led among loam soil plots.
* *South Farm (Sand) – 2650.20 kg* and *Plot B (Sand) – 1730.90 kg* showed comparatively lower productivity, emphasizing soil type influence.

**5. Water Efficiency in Farmer Management**

* *Alex Chen* (managing **Plot B**) recorded the **lowest average water usage** at *24,000 L per plot*, making him the most water-efficient farmer.

**6. Inefficiency Detection (Advanced Analysis)**

* Certain plots, such as *West Field (Wheat)* and *South Farm (Soybeans)*, showed **below-average yields but higher water consumption**, highlighting inefficiency and opportunities for improvement.

**Key Insights:**

* **Corn plots** dominated in productivity but required heavy irrigation.
* **Soil type** played a critical role, with clay and loam supporting higher yields than sand.
* **Water efficiency varies by farmer**, suggesting best practices can be shared across the team.
* Identifying **plots with high input but low output** is essential for targeted optimization.

**Conclusion:**  
The analysis equips *Agri-Innovate* and its farmers with clear, data-driven insights to optimize irrigation, improve yield outcomes, and reduce inefficiencies. By addressing underperforming plots and replicating successful practices, overall farm productivity and sustainability can be significantly enhanced.