

# **Enhancing Operational Efficiency in B2B Agritech: A Comprehensive Analysis for Valencia Agritech**

A Midterm report for the BDM Capstone Project

Submitted by

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## **1. EXECUTIVE SUMMARY**

Valencia Agritech, a B2B agritech company based in Medchal, Hyderabad, specializes in distributing agricultural inputs such as biostimulants, granules, micronutrients, and soil health enhancers. Despite a growing dealer network and robust product portfolio, the company faces challenges in dealer-level profitability visibility, stock mismanagement, and product prioritization. The absence of structured sales analytics and forecasting tools has hindered efficient inventory allocation and regional performance optimization, affecting profitability and growth in competitive markets.

To address these operational inefficiencies, detailed primary data was collected from April 2024 to April 2025. This includes over 950 dealer-wise sales records across 18 columns and 393 monthly stock entries spanning 42 columns. Key metadata such as Product ID, Product Name, Category, Revenue, Profit, Opening and Closing Stock, and Regional Dealer Information were organized for analysis. Data validation was ensured through direct coordination with the company's founder and verification with original stock and invoice records. Descriptive statistics revealed revenue peaks in June 2024, with Soil Health and Pesticides as the top-performing categories, while products like Green Magnesium showed low market traction.

Using Python tools - Pandas, Seaborn, and Matplotlib, the data was cleaned and analyzed. Visualizations such as ABC classification, SARIMA forecasting, and dealer profitability scatter plots provided critical insights. Interim findings show strong performance in Telangana and the Bio-Organic division, while highlighting overstocking, understocking, and inconsistent dealer margins. These insights now guide targeted inventory planning, regional strategies, and future forecasting improvements.

## **2. PROOF OF ORIGINALITY**

The data used in this report is primarily collected directly from Valencia Agritech, a B2B agritech company based in Medchal, Hyderabad. A meeting was conducted with Mr. ER Sagarla Srinivas, the founder of Valencia Agritech, to confirm the accuracy of the data. A confidentiality agreement was signed to ensure proper use and secure handling of the information. The data

includes dealer-wise sales, product-wise transactions, pricing, and inventory details. The following documents can be accessed by using the following -[Link](#)

### 3. METADATA

The sales data for this project was recorded directly in an Excel sheet from the beginning, covering the period from April 1, 2024, to April 30, 2025. This resulted in a dataset containing 953 rows and 18 columns, capturing detailed sales transactions across products, dealers, and regions.

In addition to the sales dataset, a stocks dataset was formulated using monthly incoming stock bills and internal inventory tracking. This dataset consists of 393 rows and 42 columns, providing monthly insights into Product ID, Product Name, Opening Stock, Sales, Incoming Stock, and Closing Stock, enabling comprehensive inventory analysis.

ATTRIBUTE	DATA TYPE	DESCRIPTION
Date	Date	Sales date for analysis.
Product Id	String	Unique ID for inventory management.
Product Name	String	Product name for SKU analysis.
Cost Price	Numerical	Cost price for margin calculations.
Selling Price	Numerical	Selling price for revenue analysis.
Size	String	Unit size of the product.
Division	String	Product category for market share.
Quantity	Numerical	Units sold in a season.
Total	Numerical	Total revenue for a product.
Opening Stock	Numerical	Stock at the start of the period.
Manufacturing Stock	Numerical	Stock produced in the month.
Closing Stock	Numerical	Stock at the end of the month.
Dealer Id	String	Dealer unique ID.
Dealer Name	String	Name of the dealer.
Sales	Numerical	Units sold in a month.

*Table 1:Meta Data*

**3.1 Data Cleaning Process:** The sales data for this project was entered directly into an Excel file from April 2024 to April 2025, which helped avoid errors that usually happen with manual notebook entries. However, some details like cost price and selling price were missing for a few products. These were filled using a product catalog provided by the business. There were also small issues like different spellings of product names, dealer names, and inconsistent date formats. These were cleaned and corrected to make the data uniform and ready for analysis.

#### 4. DESCRIPTIVE STATISTICS

YEAR_MONTH	TOTAL_REVENUE	MEAN_REVENUE	MEDIAN_REVENUE	MOST_SOLD_PRODUCT	LEAST_SOLD_PRODUCT
Apr-24	₹676,409.00	₹37,578.28	₹29,295.00	GUT	NUTRI PLUS (FORMULA 6)
May-24	₹836,665.00	₹49,215.59	₹23,445.00	ACT	GREEN MAGNESIUM 9.6%
Jun-24	₹2,208,005.00	₹116,210.79	₹28,000.00	IMPEL	GREEN MAGNESIUM 9.6%
Jul-24	₹1,771,030.00	₹98,390.56	₹26,912.50	VN PLUS(Biostimulant)	PRO MAX (FORMULA 4)
Aug-24	₹1,275,047.00	₹75,002.76	₹24,800.00	VN PLUS(Biostimulant)	PRO MAX (FORMULA 4)
Sep-24	₹1,695,317.00	₹94,184.28	₹31,442.50	GUT	GREEN MAGNESIUM 9.6%
Oct-24	₹1,645,545.00	₹91,419.17	₹18,835.00	AMAZE Granules (Loose in Drums)	GREEN MAGNESIUM 9.6%
Nov-24	₹795,700.00	₹46,805.88	₹48,210.00	AMAZE Granules (Loose in Drums)	GREEN MAGNESIUM 9.6%
Dec-24	₹771,328.00	₹51,421.87	₹16,000.00	AMAZE Granules (Loose in Drums)	AMAZE Granules (Bag)
Jan-25	₹621,455.00	₹36,556.18	₹18,700.00	ACT	V-Gold(Granules)
Feb-25	₹487,375.00	₹44,306.82	₹18,360.00	ACT	POINTER
Mar-25	₹524,121.00	₹40,317.00	₹22,400.00	GUT	GREEN MAGNESIUM 9.6%
Apr-25	₹547,080.00	₹68,385.00	₹30,920.00	IMPEL	V-CARE

Table2 : Monthly Revenue Summary:April 2024-25

From April 2024 to April 2025, June 2024 recorded the highest total revenue at ₹2,208,000, with a strong mean revenue of ₹116,210.79, indicating high sales and transaction value. In contrast, February 2025 had the lowest total revenue at ₹487,375, with a moderate mean revenue of ₹44,306.82, reflecting a weaker sales period.

Months like July and September 2024 also showed strong performance with revenues above ₹1.6 million, while March 2025 had lower median revenue (₹22,400) despite a decent total, hinting at more low-value transactions. On the product front, gut, vn plus (biostimulate), and impel stood out as consistent top sellers. Meanwhile, green magnesium 9.6% appeared frequently as the least sold product, along with others like pro max (formula 4) and v-care, indicating lower market traction.

Category	COUNT	MEAN	MEDIAN	MODE	P25	P50	P75	MIN	MAX
Biostimulant	345	14806.41	6050	9180	3040	6050	12350	275	154000
Granules	189	17576.17	11000	12800	4180	11000	20900	190	98600
Micronutrient	179	5281.09	3960	2080	2080	3960	7100	405	42000
Pesticide	190	16101.03	10055	2880	6320	10055	22230	1350	108000
Soil Health	50	28409.2	23800	46400	9120	23800	45600	1200	87360

Table 3:Category Wise Revenue Summary:April 2024-2025

Based on the category-wise revenue summary, Soil Health stands out with the highest average revenue of ₹28,409.2 and a significant maximum of ₹87,360, indicating a strong preference for higher-priced items in this category despite fewer transactions. Pesticides also show strong performance with an average of ₹16,101.03, driven by a few high-value sales, reaching ₹108,000. Granules demonstrate consistent sales with an average of ₹17,576.17 and a moderate range, while Biostimulants, with 345 orders, show a high demand with a mean of ₹14,806.41 and a maximum of ₹154,000. Micronutrients, with the lowest mean of ₹5,281.09, display moderate

and balanced demand, with a steady price range. Overall, Soil Health and Pesticides dominate in high-value sales, while Granules and Biostimulants reflect consistent demand.

## **5. DETAILED EXPLANATION OF ANALYSIS PROCESS/METHOD**

**5.1 Data Loading and Initial Analysis:** The dataset was initially recorded in an Excel sheet and loaded into a Pandas DataFrame for analysis. Key columns such as Product ID, Product Name, Division, Packing Size, and monthly stock data, including Opening, Manufacturing, and Closing Stock, were examined for each product from April 2024 to April 2025. Sales data was also analyzed to gain insights into product quantities sold.

**5.2 Data Preprocessing:** Missing values in product quantities and stock data were identified and filled by referencing the product catalog and other sources. Products were categorized into relevant divisions like Bio-organic Division and types such as Granules, Syrup, and Lotion, allowing for a more structured analysis of sales and inventory trends.

**5.3 Descriptive Statistics:** Key metrics, including mean, median, and other descriptive statistics, were calculated for each category to summarize the dataset. Monthly total revenue was analyzed, and the best and least performing products and categories were identified. This provided insights into the overall trends and variability within the dataset.

**5.4 Dealer Profitability Analysis:** A scatter plot was created to analyze Gross Profit and Average Profit Margin for each dealer, providing insights into dealer performance. This analysis helped identify high and low-performing dealers, assess profitability variations, and understand the overall financial health across different dealers.

**5.5 Product-Level Sales Analysis:** An ABC classification was performed to analyze product sales based on units sold, categorizing products into A, B, and C groups. This analysis provided insights into product demand, helping to prioritize high-performing products and optimize inventory management. Additionally, a SARIMA model was used to forecast future sales, assisting in better resource allocation and production planning.

**5.6 Regional Dealer Performance Insights:** A bar chart was created to visualize Total Units Sold by state, providing a clear view of regional performance. This analysis highlighted both high and low-performing regions, helping to identify areas that need targeted support. Additionally, dealer-wise sales in the top-performing states were analyzed, offering insights into regional disparities and assisting in better resource allocation and strategic planning.

6. RESULTS AND FINDINGS

6.1 Overview:

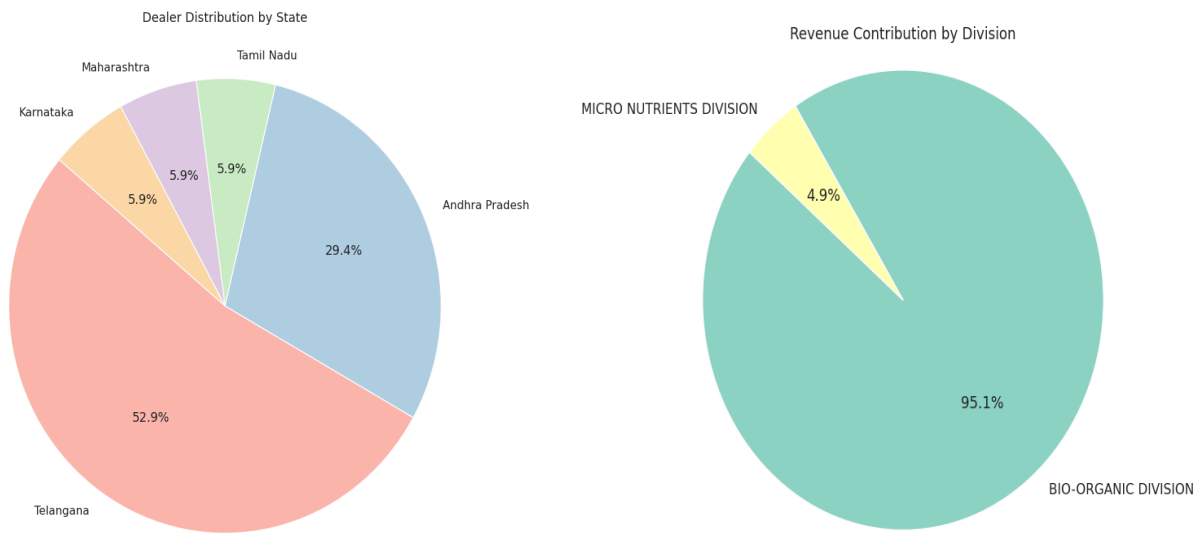


Figure 6.1.1:Pie Charts

The Dealer Distribution by State chart highlights the significant role of Telangana, which leads with 52.9% of the total dealer network, emphasizing its central importance in the market. Andhra Pradesh follows with 29.4%, showing strong regional engagement. Smaller states like Tamil Nadu, Maharashtra, and Karnataka each contribute 5.9%, indicating steady but less dominant markets.

Revenue Contribution by Division chart reveals that the Bio-Organic Division is the primary revenue driver, contributing a dominant 95.1%, while the Micro Nutrients Division lags behind with just 4.9% of the total revenue, signaling a need for improvement in this segment. These insights underline the critical need for strategic focus on Telangana and Bio-Organic products to

optimize growth, while addressing opportunities for expansion in other regions and improving the performance of the Micro Nutrients Division

**6.2 Dealer Profitability Analysis:** Gross Profit vs. Average Profit Margin graph compares the gross profit and average profit margin of various dealers. It provides insights into the profitability of each dealer by showing how much profit they generate per unit of sales.

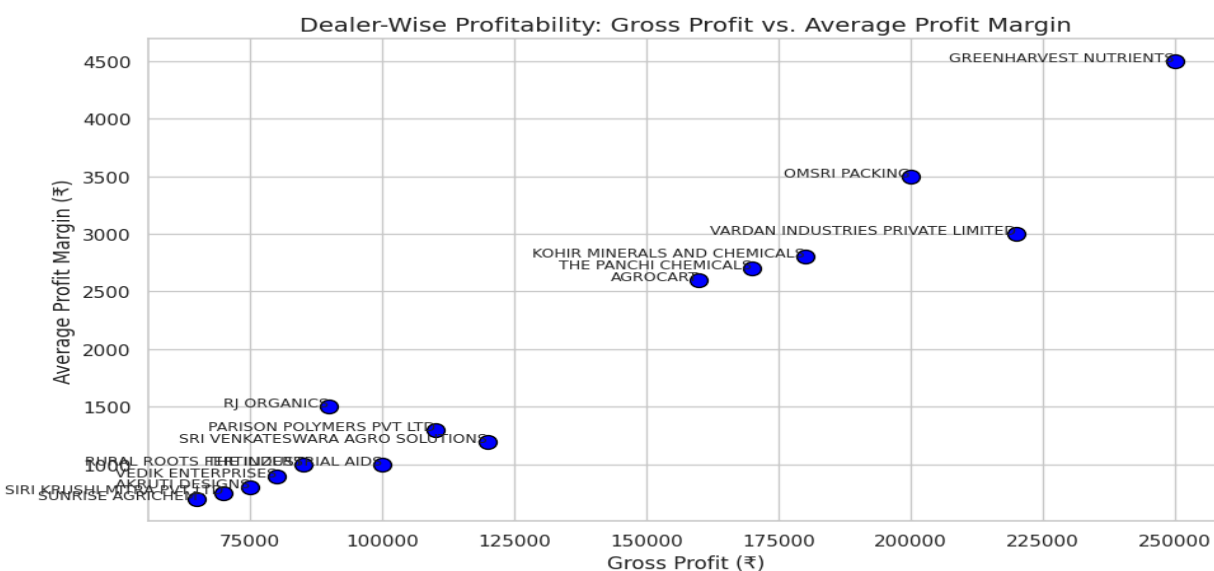


Figure 6.2.1:Gross Profit vs. Average Profit Margin graph

Dealer Name	Gross Profit (₹)	Average Profit Margin (₹)
GREENHARVEST NUTRIENTS	250000	4500
OMSRI PACKING	200000	3500
VARDAN INDUSTRIES PRIVATE LIMITED	220000	3000
KOHIR MINERALS AND CHEMICALS	180000	2800
THE PANCHI CHEMICALS	170000	2700
AGROCAR	160000	2600
SRI VENKATESWARA AGRO SOLUTIONS	120000	1200
THE INDUSTRIAL AIDS	100000	1000
PARISON POLYMERS PVT LTD	110000	1300
RJ ORGANICS	90000	1500
VEDIK ENTERPRISES	80000	900
AKRUTI DESIGNS	75000	800
RURAL ROOTS FERTILIZERS	85000	1000
SIRI KRUSHI MITRA PVT LTD	70000	750
SUNRISE AGRICHEM	65000	700

Figure 6.2.2 : Dealer Profit Comparison Table

The Gross Profit vs. Average Profit Margin graph, supported by the data from the table, compares the performance of various dealers. Greenharvest Nutrients leads with the highest gross profit of ₹250,000 and an average profit margin of ₹4,500, indicating strong pricing and cost management. In contrast, Sunrise Agrichem, despite a similar gross



profit of ₹65,000, has a much lower margin of ₹700, suggesting inefficiencies in profit generation.

Dealers like Omsri Packing and Vardan Industries Private Limited show solid profitability with margins of ₹3,500 and ₹3,000, respectively. Meanwhile, Sri Venkateswara Agro Solutions and Vedik Enterprises have lower margins (₹900 and ₹1,000), highlighting areas where pricing or cost strategies could be improved.

This analysis, based on both the graph and the table, emphasizes the need for targeted strategies to boost profitability, particularly for dealers with lower margins, while leveraging the best practices from top performers.

**6.3 Product-Level Sales Insights:**The Monthly Sales: Actual vs. Predicted graph compares actual sales (bar chart) with sales predicted using the SARIMA (Seasonal ARIMA) model (red line).

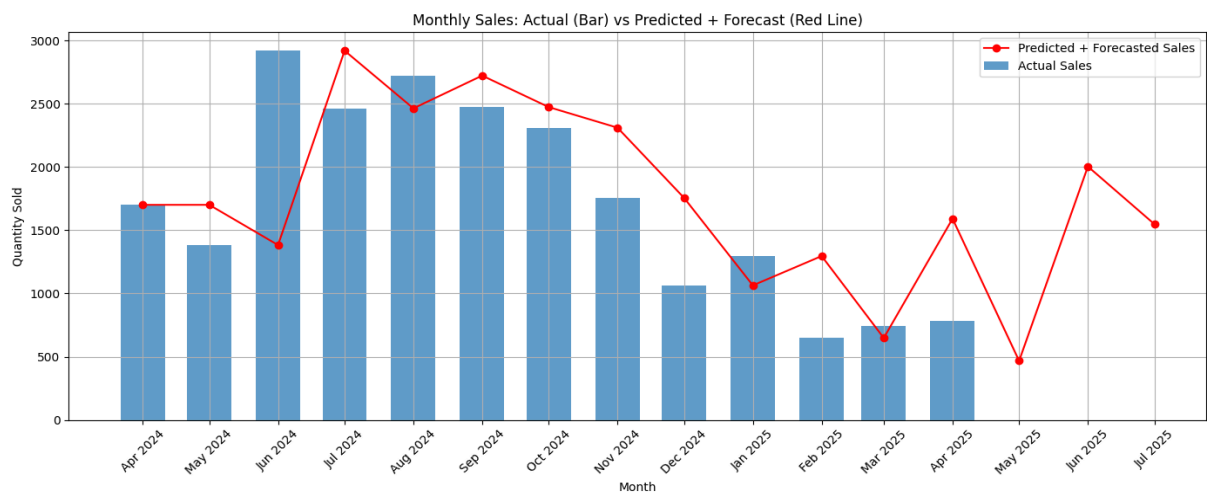


Figure 6.3.1: Monthly Sales: Actual vs. Predicted

The ABC Classification of Products Based on Units Sold graph categorizes products into high (green), moderate (orange), and low (red) sales segments. High-demand products like vision (250 ml) fall under Category A and should be prioritized for production and

stock planning. On the other hand, low-selling products such as pro max (Formula 25 Kg) fall into Category C and may require improved marketing or pricing strategies.

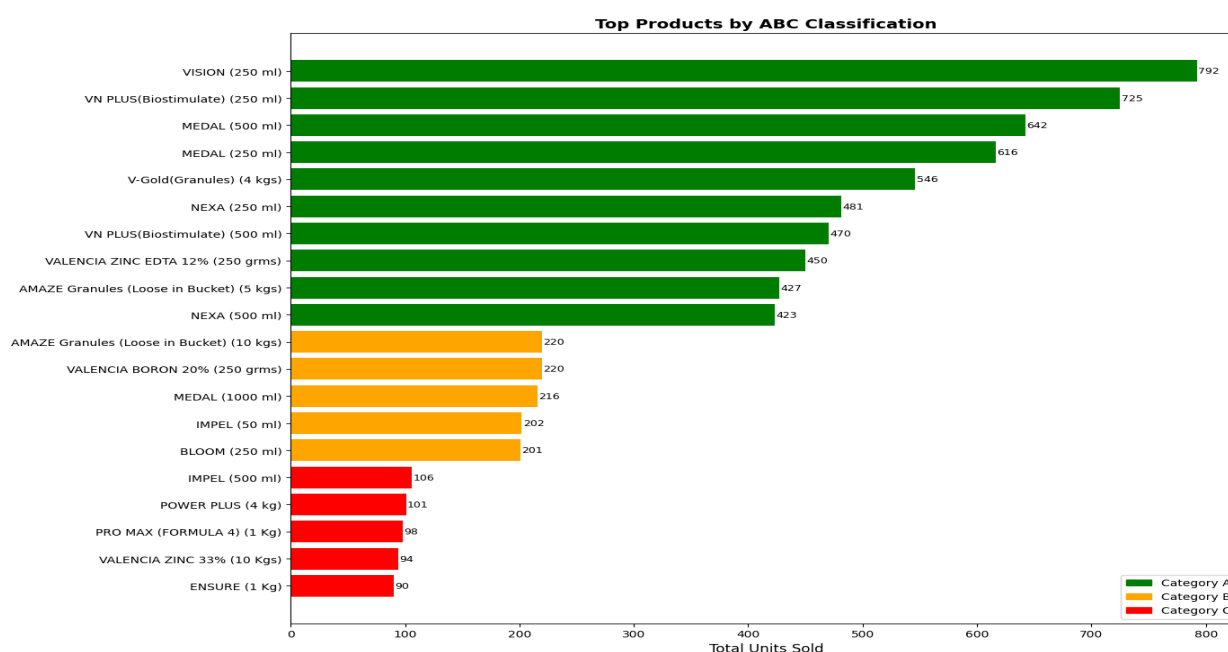


Figure 6.3.2: ABC Classification

The SARIMA model accounts for trends and seasonality in forecasting. Discrepancies, such as the spike in June 2024 where actual sales exceeded predictions, highlight where the model may need refinement. These insights support improving demand forecasting and aligning production more closely with real sales patterns.

**6.4 Regional Performance Analysis:** The Total Units Sold by State graph highlights significant regional disparities in sales. Telangana leads with the highest units sold, while states like Maharashtra, Tamil Nadu, and Karnataka show comparatively lower performance. This indicates a need for targeted strategies in underperforming states to improve overall sales.

The **Dealer-wise Sales in Top 5 States** graph shows the performance of individual dealers in these regions. It highlights the disparity in dealer performance across states, with some dealers excelling in specific states while others lag.

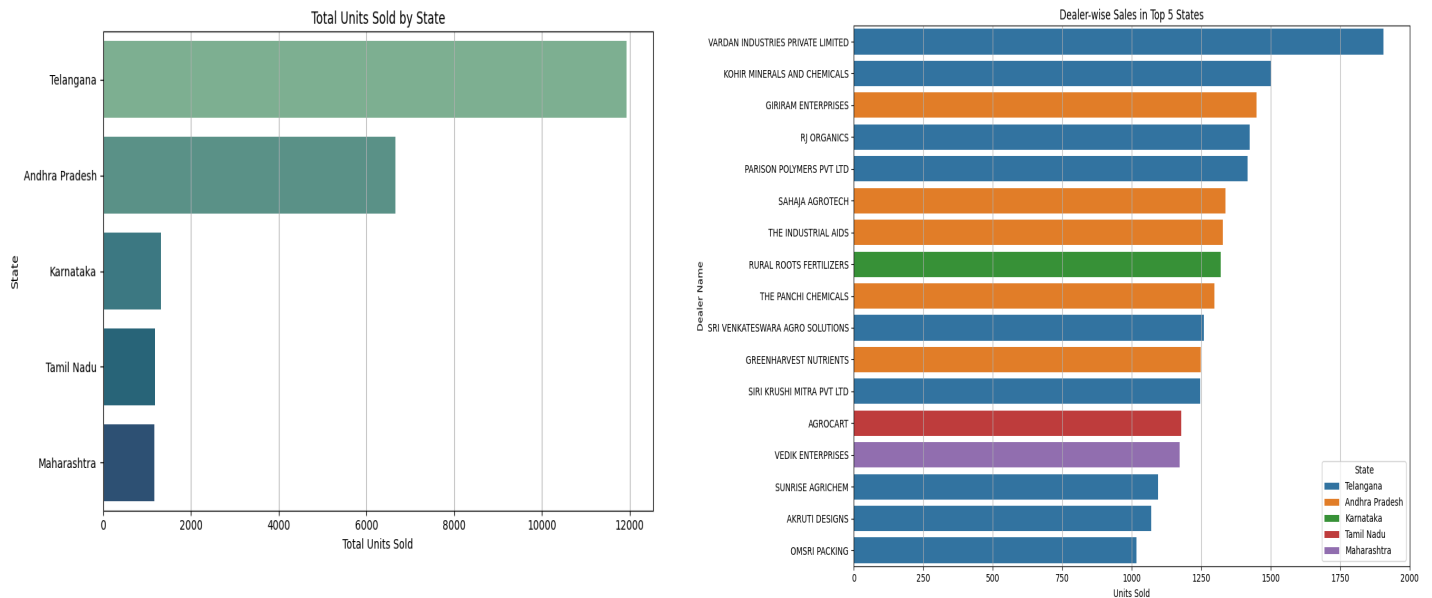


Figure 6.4.1 & 6.4.2: Units Sold by State and Dealer Sales in Top 5 States

This data can be used to identify underperforming dealers in regions with lower sales, allowing for focused interventions to support these dealers and reduce performance gaps. These insights provide a clear direction for addressing regional disparities by focusing efforts on underperforming regions and dealers, ultimately enhancing operational efficiency.

## 7. Conclusion

This midterm analysis of Valencia Agritech reveals key inefficiencies in dealer profitability, inventory management, and regional sales performance. High-performing dealers like Greenharvest Nutrients contrast sharply with low-margin ones, indicating a need for targeted pricing strategies. Inventory trends showed early understocking and later overstocking, affecting cash flow and product movement. SARIMA forecasting aligned well with actual sales, though some seasonal spikes highlight areas for refinement. Category analysis showed Soil Health and Pesticides as top revenue drivers, while Micro Nutrients underperformed. Overall, the study emphasizes the importance of data-driven planning, inventory control, and strategic focus on profitable products and regions to enhance efficiency and profitability.