

8th Annual

# Global TechMining Conference

## TECHNOLOGIES FOR THE PRODUCTION OF BIOFERTILIZERS: TRENDS AND OPPORTUNITIES

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### Introduction

The more affordable cost of organic fertilizers presents itself as a major advantage when compared to traditional fertilizer. Difficulties, on the other hand, lie in the high initial costs of investment, low awareness of the benefits of using biological fertilizers by farmers, the restricted shelf-life of biofertilizers, the need for training applicators and research related to specificities of each type of crop (BUSINESS WIRE, 2016, BARMAN, 2017). Patent monitoring becomes an informational decision-making tool that promotes a better insertion of technologies in the production chain. Monitoring data can point to trends and scenarios for technology and planning investments in biofertilizers.

The work presents the results of access to the database of patents related to the production of biofertilizers through the advanced patent search system of the Vantage Point (VP) tool.

### Methodology

VP is a text mining software used for trend discovery in virtually any structured text database. The tool uses a dictionary of related words (thesauri) to group authors, institutions and terms through Natural Language Processing. It demonstrates a greater potential for compatibility and cross-referencing as a competitive intelligence tool focused on the analysis of business opportunities.

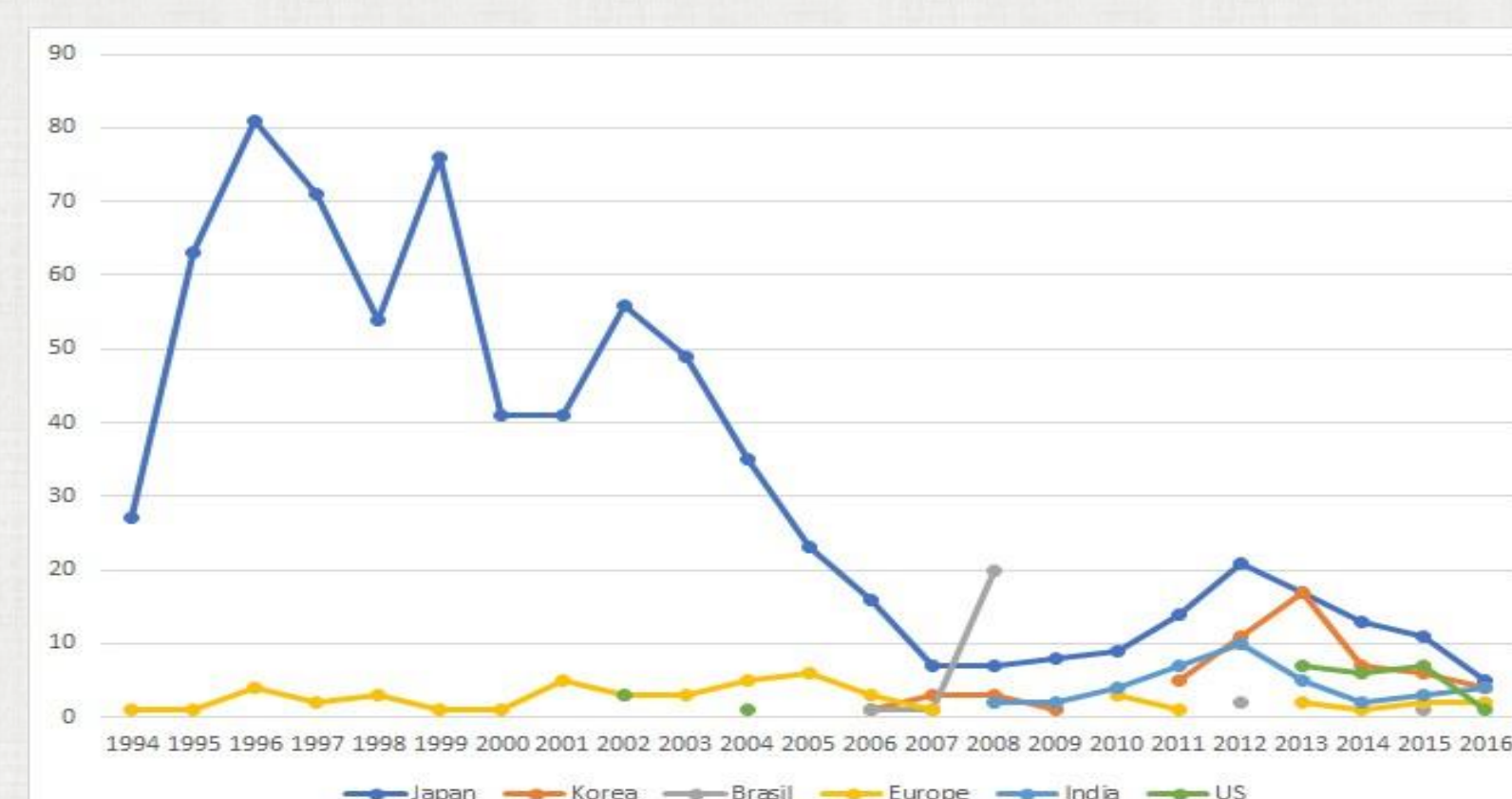
A research was conducted with the term biofertilizer, referring to the search for biofertilizers.

After obtaining the results of patent publications, a treatment of the data was performed by institutions, authors and terms. The next action was to cross the said data with the years. This is the strong point of the Patent Vantage Point, which allows to carry out accurate analysis, since the data is first cleaned before crossing.

### Production of Biofertilizers: Patent Search from VP

Due to the great potential of the agribusiness sector, the present work developed through the VP search system an initial analysis of patent families associated to the production of biofertilizers. In the reuse of waste for fertilizer production, most of the results were related to the production of basic chemicals, fertilizers and nitrogen compounds, plastics and synthetic rubber in primary forms with the IPC classification code C05F, followed by the IPC classification code B09B. Figure 1 lists the main profiles with patent publications in this scope: Japan, Europe, the United States, Korea, India and Brazil for data collected until the year 2016.

Figure 1 - Number of Patent Publications x Year collected through the VP tool related to the Production of Biofertilizers.



Source: Elaborated by the authors, 2017, data generated by the VP.

### Final Considerations

Japan, Europe, the USA, Korea, India and Brazil are among the most prominent countries in the field of patent publications for waste management for the production of biofertilizers.

This assertion is ratified by a total of 1,952 patent publications (100%) associated with the classification of basic chemical products, fertilizers and nitrogen compounds, plastics and synthetic rubber in primary forms, followed by classifications associated with the manufacture of machines.

It is worth noting that in addition to the strong presence of the fertilizer segment, there is a presence of classifications associated with the medical and dental, pharmaceutical, food, oil, transport, construction, cosmetics and beverages sectors.

A more detailed analysis of the patents thus verified will make it possible to identify relevant technologies, incremental innovations, market niches for performance and technological maturity level, especially when compared to the number of articles published per country.

### References

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