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Mini Review

Evolution of Agricultural Sciences from Exploring Knowledge and making a Difference

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Abstract

New discoveries and insights from the biological, chemical, and biophysical sciences are incorporated into agricultural sciences, along with increasingly sophisticated experimental techniques, quantitative methodologies, and models for data analysis and processing. (Li C Hu Y et al., 2017) From 1800 onward, when fresh understandings of photosynthesis and mineral nutrition were included into the theory underlying crop growth, significant advances were made. Before a more sensible idea on mineral nutrition superseded the humus theory, it took nearly fifty years. Classical plant and animal breeding, (Cole S A et al., 2017)which was primarily based on crossover and selection, received a boost from the genetics underpinning it with Darwin's publication on domestication in 1868 and the uncovering of Mendel's laws in 1900. A significant achievement of the The convergence of Mendelian inheritance and Darwinian natural selection is known as evolutionary synthesis. Within a few decades, the impact of the discovery of the DNA structure in the middle of the 20th century on current plant breeding was evident. Advanced phenotyping under controlled settings has gained popularity as a way to evaluate the vast variety of plant features for the performance of plants in yield and quality of the produce. Phenotyping in situ is necessary for genome-wide selection for environments with multiple stressors, though. Since 1800, there has been a shift away from general observations of plants, fields, and farms and toward focused experimentation. The techniques for experimentation and data analysis were significantly enhanced during the 19th centuries. The value of controlled experimentation wasn't realised until the middle of the evolution. The foundation for mechanistic modelling of crop growth and output came from controlled studies of plant processes. For agricultural research to advance significantly and have an impact, a systems approach combining knowledge at many scales and bringing cutting-edge results from the basic sciences into applied sciences will become crucial. The ability to conduct agricultural research and innovate in this field will continue to be influenced by advancements in the linked basic sciences. Therefore, maintaining or even accelerating scientific advancement calls upon substantial public funding. Widespread public support is necessary for this. Partnerships between the public and commercial sectors will be necessary (Mason N M et al., 2017) to close the innovation gap.

Keywords: Bibliometric analysis, Semantic networks, Ecosystem services, Agricultural sciences, Socio-ecosystem

INTRODUCTION

(Luo Y et al., 2017) Based on empirical understanding and human wisdom, agricultural science emerged in the Arab, Asian, Greek, Maya, and Roman cultures. The complex irrigation systems from at least 2000 years ago are well-known. Agriculture would not have advanced without the development of written documentation and spoken communication, as well as agricultural implements and infrastructure. (Wang H et al., 2017) The transition from prehistoric to modern farming practises in Europe was described by a variety of authors as moving from a subsistence agrarian economy to one that could support societies that invested resources in building monastic institutions and cultural landmarks in cities through spatially dispersed trade in agricultural commodities.(Baležentis T et al ., 2021) Moore looked at the connections between agricultural revolutions and socioeconomic advancements from 1450 to 2010. (2010). He came to the conclusion that capitalist organisations led subsequent agricultural revolutions that produced surpluses of food. However, a working-class family in Berlin in 1800 spent over 73% of their household income on food, with two-thirds going toward bread. So there was always a potential food crisis when there was political unrest. With the expansion of cities, more food had to be produced than what the agrarian group needed for subsistence. Agricultural research advancements (Balsalobre-Lorente Det al., 2019) came considerably later than the modernization of the sciences as a whole. Isaac Newton, with the publication of the Philosphiae Naturalis Principia Mathematica in 1687, was a giant in the modernization of science. He was the first scientist to create novel ideas about time and space. The significance of theory and experiment was emphasised by Newton. Before about Before the introduction of systematic experiments in agricultural sciences around 1800. (Barbera AJ et al., 1990) Society expectations and needs, on the one hand, and the knowledge offered by basic sciences, on the other, have influenced the evolution of agricultural sciences several societal and scientific trends. In this study, significant events from the years 1800 to 2000 that had an impact on the subject matter and curriculum of agriculture science are given and examined. According to the theory, (Adetutu MO et al ., 2020) significant advancements in agricultural research were based on recent discoveries in basic sciences. Particularly in the fields of mathematics, biology, physics, and chemistry. The discovery of the DNA structure, the chemical management of plant growth, and improved knowledge of food quality and safety were all made possible thanks in large part to chemistry. In order to create ideas on photosynthesis, crop geometry and light usage, and soil structure and processes, physics has played a crucial role. The contribution of biology to new understandings of crop phenology, pest and disease incidence, and other topics molecular and cell biology have recently been used in plant breeding. Additionally, the development of statistical studies and mechanical modelling involved mathematics. This review's goal is to assess the limitations and traits of significant advances in agricultural sciences in the past. On the basis of the current developments, a forecast for future advancements in agricultural sciences is also provided (10. Z Meng J et al., 2017).

The development of agricultural sciences in the 19th century

There were several hypotheses about how the soil fed plants. Manure's and water's functions have long been understood. There were numerous hypotheses on how plants ingested salts, "juices," and even soil particles. The groundbreaking research on leaf photosynthesis conducted by Priestly in 1777 and Ingen-Houszin in 1780 served as the foundation for our current understanding of how plants assimilate carbon dioxide. These fresh perceptions were released in a book.

Building capacity in the public and commercial sectors for agricultural sciences in the 20th century

One aspect of 20th-century advancement is the synergy between agricultural and plant sciences. Research and development on agricultural production have been sparked by our increased understanding of how individual plants and plant communities function, particularly in solo crops but also in a variety of cropping configurations (mixed crops, intercrops, relay-intercrops, double cropping, etc.). By the 1970s, field research had improved in terms of scientific dependability and effectiveness.

Agriculture sciences in the twenty-first century: problems and prospects

Increasingly people are becoming aware of the need for increased agricultural research investments in order to meet the demands of a rapidly expanding global population as the resources necessary to produce food, feed, and green feed supplies become more limited. Particularly, this is true for land, water, and several crucial nutrients (e.g. phosphorus and zinc). Finding ways to generate more with fewer inputs will be difficult in the previous century, agronomists.

DISCUSSION AND CONCLUSIONS

From 1800 onward, when fresh understandings of photosynthesis and mineral nutrition were included into the theory underlying crop growth, significant advances in agricultural sciences were made. Including new research and ideas from biological and biophysical sciences, conducting experiments in increasingly sophisticated ways, and, last but not least, using quantitative methods and models for data analysis and processing are what cause changes in the agricultural sciences.

REFERENCES

1. Li C Hu Y, Zhang F (2017). Multi-pollutant emissions from the burning of major agricultural residues in China and the related health-economic effects. Atmos Chem Phys.17:1-71.
2. Cole S A, Xiong W (2017). Agricultural insurance and economic development. Annu Rev Econom. 9: 133-143.
3. Mason N M, Jayne TS (2017). The political economy of fertilizer subsidy programs in Africa: evidence from Zambia. Am J Agric Econ. 99:705–731.
4. Luo Y, Long X (2017). Decoupling CO2 emissions from economic growth in agricultural sector across 30 Chinese provinces from 1997 to 2014. J Clean Prod.159:220-228.
5. Wang H (2017). The economic and social performance of integrated photovoltaic and agricultural greenhouses systems: case study in China. Appl Energy.190: 204-212.
6. Baležentis T, Blancard S (2021).Analysis of environmental total factor productivity evolution in European agricultural sector. Decis Sci. 52: 483-511.
7. Balsalobre-Lorente D (2019) Do agricultural activities induce

carbon emissions? The BRICS experience. ESPR. 26: 25218-25234.

8. Barbera AJ, McConnell VD (1990) The impact of environmental regulations on industry productivity: direct and indirect effects. JEEM.18: 50-65

9. Adetutu MO, Ajayi V (2020) The impact of domestic and foreign R&D on agricultural productivity in sub-Saharan Africa. World Dev.125:104-690

10. Z Meng J (2017). Chinese CO2 emission flows have reversed since the global financial crisis. Nat Commun.8: 17-12.