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The causal relationship between agricultural practices, climate change and greenhouse gas recovery

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Abstract: The paper provides an overview of the agricultural economy in terms of agricultural development, especially in the field of application of agricultural techniques depending on climatic zones. Environmental protection and sustainable management of natural resources, prioritizing action behavior in terms of good practice methods in soil treatments, especially vulnerabilities on the types of fertilizers used, are part of the soil-plant-air-water equation. The change of paradigms in agriculture with climate change involves the adaptation of agricultural systems the risks of using fertilizers in soil treatment, the interdependence of plant-soil-water in agricultural practice is also highlighted in the paper. One of the main objectives in the field of agriculture is to maintain a low level of greenhouse gas emissions from the agricultural sector without diminishing the importance of biosphere protection. The role of research and studies has shown an important factor in reducing the carbon footprint per tonne of food produced from organic farming compared to conventional farming, mainly due to the abandonment of the use of chemical fertilizers and pesticides. So on Maslow's motivational scale, looking at the evolution of needs In relation to their satisfaction, we simulated the relative motivational value of the needs determined on the basis of experience. The purpose of the following research is to collect data and information on the most effective management models that will create the premises for agricultural practices applied to the soil by preventing pollution of groundwater and surface water with nitrates. from agricultural sources and by promoting the use of good practices farm. The Common Agricultural Policy (CAP) supports the Nitrates Directive by granting direct assistance and through rural development measures. There is also a growing trend for agro-ecological initiatives for which farmers can receive payments. nutrient management measures, such as the creation of buffer zones, as an element to stimulate environmental protection. During the research we tried to highlight aspects that, in our opinion, are important for the development of the agricultural sector through innovative rural development measures as part of the economy.

Keywords: climate change, agricultural practices, greenhouse gas emissions, soil

1. Introduction

Most agricultural soils contain too little natural nitrogen available to meet growing requirements during the growing season. As a result, it is necessary to supplement the nitrogen naturally contained in the soil every year. Applying the right amount of nitrogen at the right time is the basic requirement for good fertilizer management. Nitrogen requirements vary considerably in different crops and within the same crop, the level of harvest being possible to be reached in a certain conjuncture of

climatic and technological factors. Due to the specific behavior of nitrogen in the soil, fertilization with this nutrient and also techniques cultivation that influences its dynamics in the soil must be carried out in a way that minimizes losses with percolating water, thus reducing the risk of nitrate contamination of groundwater and surface water (Tecimen, 2017; Joshi & Chilwal, 2018; Işık, & Kırkpınar, 2020).

2. Experiments

The 1991 Nitrates Directive is one of the first EU legislation to control pollution and improve water quality. Although nitrogen is a vital nutrient that contributes to the growth of plants and crops, high concentrations of nitrogen are harmful to humans and nature. Agricultural use of nitrates in organic and chemical fertilizers is a major source of water pollution in Europe. Consumption of mineral fertilizers first fell sharply in the early 1990 and stabilized over the last four years in the EU-15, but in all 27 Member States nitrate consumption increased by 6%. In general, animal husbandry remains the main cause of over 50% of total nitrogen discharges into surface waters activities related to livestock and fertilizer management release nitrogen oxide (N2 O) and methane (CH4), greenhouse gases with a global warming potential of 310 and 21 times higher than CO2, respectively. If fully implemented, the Nitrates Directive could reduce, by 2020, for example, N2 O emissions by 6% compared to 2000 levels and help combat climate change. The Common Agricultural Policy (CAP) supports the Nitrates Directive through direct assistance and rural development measures. For example, a number of Member States have included among agri-environmental initiatives for which farmers can receive payments for nutrient management measures, such as the creation of larger buffer zones around watercourses.

The establishment of the institutional framework for action for the sustainable use of pesticides in Romania is amended and supplemented by the transposition of Commission Directive (EU) 2019/782 of 15 May 2019 amending Directive 2009/128 / EC of the European Parliament and of the Council on the establishment of harmonized risk indicators published in the Official Journal of the European Union on 15 May 2019.

Biodegradation has been shown to be suitable for:

- petroleum hydrocarbons, such as diesel, light liquid fuel, gasoline, kerosene, mineral oils, benzene, toluene, xylene, etc.
- crude oil waste, sludge and oily residues;
- organic products and residues from the basic chemical industry (alcohols, acetone, phenols, aldehydes and other solvents);
- complex compounds such as polycyclic aromatic hydrocarbons and pesticides.

3. Results

The soil can degrade depending on many objects. The pesticides applied must be as specific as possible to the source objective as they can have side effects on human health, non-target organisms and the environment. Thus, an important role in the application of fertilizers has multifunctional protection areas figure [1], which must be recognized as an integral part of agricultural areas, considering on the one hand that they maintain the ecological balance and contribute to biodiversity conservation: ensuring corridors for wildlife. , and on the other hand have the effect is to reduce the risks of pollution with plant protection products of water sources adjacent to agricultural fields, while avoiding the phenomenon of soil erosion.

3.1. Overview of main findings

3.1.1. Stormwater management

1. The climatic changes faced by large commercial agricultural holdings being different from those of subsistence, of very small dimensions. Climate change is expected to affect farmers in the south and south-east region of Romania in general and individually. Given that large farms usually have very specialized production, such as cereals and oilseeds, they are particularly vulnerable to the impact of frequent and long-term droughts, which affect their production and profit. But they are well-informed professionals, have the necessary technical and financial resources and have more options to adapt their agricultural systems to climate change through new technologies and irrigation systems. Smallholder farms, which practice subsistence farming, are very socially and economically vulnerable to adverse climatic events, in agriculture working directly about one third of the population. In some individual cases, farmers are specialized in the production of specific crops, such as onions or potatoes, thus increasing their level of vulnerability. In other cases, some intrinsic resistance can be found in smallholder communities due to the practice of organic farming and resource recycling, low carbon economy, diversity of production, strong social relations and (in some regions) alternative sources of income. European countries traded nearly 1.8 million tonnes of pesticides per year during the period 1990-2018, representing more than 1/3 of the global share (Figure 2).
2. It should not be neglected that adding fertilizers to improve soil quality can help increase soil structure performance, balance pH and, in some cases, help bind contaminants and reduce exposure, providing additional benefits to the property and biosphere of the environment. A farm through the use of good soil pH management practices can bring alternative benefits such as improving the environment and stormwater management.

3.2. Figures, Tables and Schemes

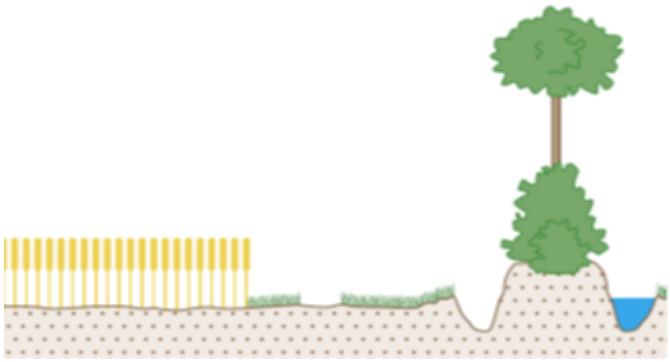

Figure 1. Multifunctional protection zones

Souce MADR

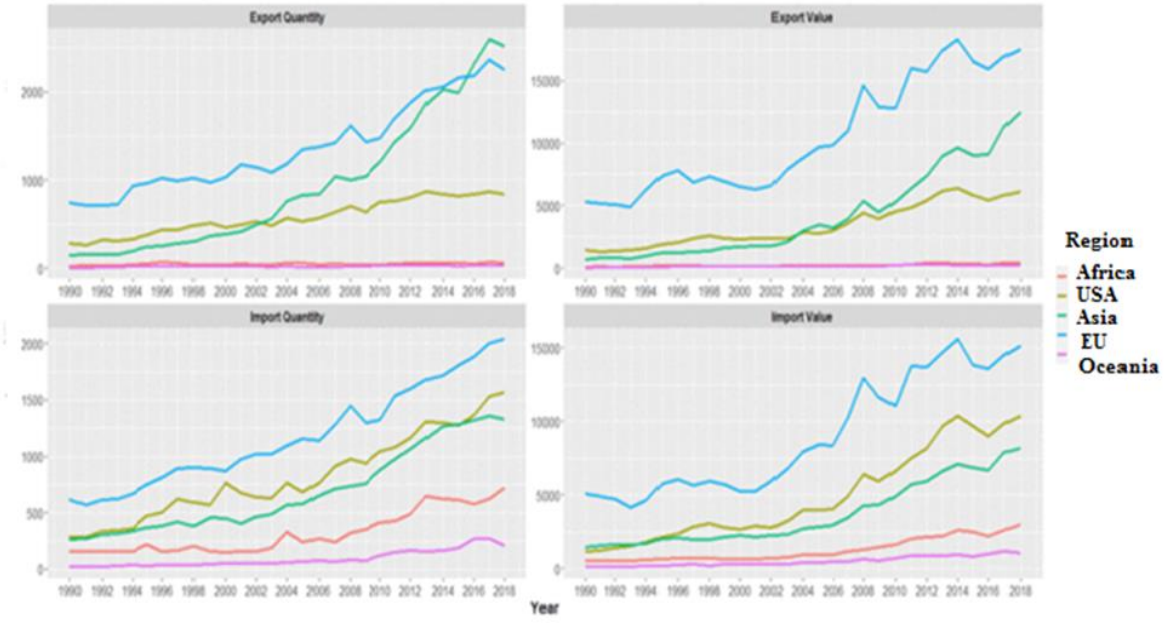

Figure 2. Regional Imports and Exports of Pesticides. Total amounts, 1990-2018
Source Rome, Jun 11 2020 FAQSTAT Pesticide Trade

Table 1 Standards for the maximum amounts of nitrogen fertilizer

Index[1]	Standards for the maximum amounts of nitrogen fertilizer that can be applied on lands with slopes less than 12%	Standards for the maximum amounts of nitrogen fertilizer that can be applied on lands with slopes greater than equal to 12%
pastures	100	80
Corn grain	130	80
Sugar beet	170	120
sunflower	100	80
wheat	120	90

[1] Kg N /ha / an.

3.3. Formatting of Mathematical Components

In our country, the Martonne Index or aridity index:

$$\sum W = \frac{P}{T+10} \quad (1)$$

,

The climate has a great influence on the processes of wind and water erosion of the soils through its main components wind and water.

And

P - average multiannual precipitation

T - multiannual average temperatures

The aridity index shows the following values in the climatic conditions in our country: around of 17 in the steppe area, 50 in the forest area and over 80 in the mountain area.

4. Discussion

The expectations regarding the sustainability of the agricultural system have a long concern, what we propose is that, at the same time, we must not produce imbalances in the soil-water-plant equation. The balance of the biosphere beyond the establishment of the nutritional regime of plants is a prerogative, so we need to analyze the application of agricultural practices according to climatic characteristics and texture, soil topography. Not infrequently we tend to analyze statistical indicators to ensure the growth and development of cultivated plants according to optimal production. In the research we analyzed some of the vulnerabilities, in the sense that if the agricultural practices and tradition must have a common denominator when we talk about fertilizers depending on the four elements, the properties of the soil, the nutrients needed for the analyzed production of culture, climate but also the tradition of the place. Together, these elements can be sources of environmental protection.

5. Conclusions

The International Treaty on Plant Genetic Resources for Food and Agriculture (2004) and the Global Strategy for Plant Conservation (2011–2020) adopted by the Convention on Biological Diversity in 2002 emphasize the need for efficient conservation of plant genetic resources for food and agriculture as a means of counteracting the current rate of biodiversity loss at global, regional, national and local levels.

That is why scientific research, whenever it will add a plus to the scientific equation, we will only be able to exclude any element that could not omit the right to give more information. It is good to know that research and innovation activities and services complement scientific information, traditionally born agricultural practices, which can help farmers to adopt production systems that best meet local characteristics. In our opinion, the agricultural lands in general and especially those in Romania have considerable potential for carbon capture and storage. It is vital to have improved agricultural systems that efficiently utilize nutrient resources, increasing not only the amount of carbon in the soil, but also the biodiversity and resistance of agriculture even to climate change. As a rule, carbon stocks in agricultural soils can be increased by adapting certain agricultural activities. Research also shows that carbon absorbers are just as important as reducing emissions. Maintaining and further improving the natural absorbents represented by soils, agricultural land and coastal wetlands are essential. The consumption of pesticides according to recent data provided by Eurostat is worrying and therefore our guidance must also include alternative methods to reduce the consumption of pesticides by switching to organic fertilizers, and here we are talking about grasslands that should not be neglected.

Conflicts of Interest: "The authors declare no conflict of interest."

Abbreviations

PAC: Common Agrciultural Policy
FAQSTAT: Food and Agriculture Organization

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