

## Fertilizers Used in Apricot Production in Turkey: Benefits and Potential Hazards

İbrahim Halil YANARDAĞ and Asuman BÜYÜKKILIÇ YANARDAĞ

Malatya Turgut Ozal University, Agriculture Faculty, Soil Science and Plant Nutrition  
Department, Battalgazi, Malatya, Turkey.

*e-mail:* [asuman.yanardag@ozal.edu.tr](mailto:asuman.yanardag@ozal.edu.tr), *ORCID:* 0000-0003-3236-1532,

*e-mail:* [ibrahim.yanardag@ozal.edu.tr](mailto:ibrahim.yanardag@ozal.edu.tr), *ORCID:* 0000-0003-2558-9600

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**Abstract-** Turkey is a leader in apricot production worldwide, and Malatya and its surrounding regions in particular account for most of the country's apricot production. The productivity and quality of apricot production depends on the agricultural inputs used, especially fertilizers. Fertilizers are used to meet the nutritional needs of plants, increase productivity and improve product quality. However, overuse or misapplication of fertilizers can lead to environmental and economic problems. In this study, the types, benefits and possible damages of fertilizers used in apricot production in Turkey will be discussed in detail.

Fertilizers used in apricot production in Turkey are of great importance in terms of plant nutrition and productivity. While organic fertilizers support soil health and plant growth, chemical fertilizers provide fast and effective nutrition to plants. However, overuse of fertilizers can lead to environmental and economic problems. Therefore, adopting a careful and balanced approach to fertilizer use is important to promote sustainable agricultural practices and reduce environmental impacts. Scientific research and experience can guide farmers to ensure more efficient and environmentally friendly use of fertilizers.

*Keywords:* Apricot, Fertilizer, Harm, Benefit, Effect.

## I. INTRODUCTION

Turkey is the world's leading apricot producer, with Malatya and the surrounding regions in particular accounting for the bulk of the country's apricot production. The productivity and quality of apricot production depends on the agricultural inputs used, especially fertilizers. Fertilizers are used to meet the nutritional needs of plants, increase productivity and improve product quality. However, overuse or misapplication of fertilizers can lead to environmental and economic problems. In this article, the types, benefits and possible damages of fertilizers used in apricot production in Turkey will be discussed in detail. Apricot has an important place in Turkey's agricultural production and is widely cultivated especially in Malatya and its surrounding regions. Turkey is known as one of the largest apricot producers worldwide and apricot has a significant economic value both in the domestic and international market (Anonymous, 2021). The success of apricot production is directly related to the nutrient status of the soil and the quality of fertilizers used, among many other factors.

Fertilizers provide the nutrients plants need for healthy growth and high yields. Apricot trees especially need essential nutrients such as nitrogen, phosphorus and potassium. Therefore, it is of great importance to apply the right fertilization strategies in agricultural production (Havlin et al., 2014). Fertilizers used in apricot cultivation in Turkey can be divided into two main categories: organic and chemical. Organic fertilizers improve soil structure and support long-term soil health, while chemical fertilizers provide short-term yield increases by providing nutrients to plants quickly.

Organic fertilizers maintain the natural balance of the soil, increase microorganismal activities and improve the water holding capacity of the soil (Brady & Weil, 2008). Chemical fertilizers, on the other hand, provide the nutrients needed by plants at specific rates and quickly, but can cause environmental problems when used incorrectly (Fageria, 2001). In particular, overuse of fertilizers can lead to soil contamination and pollution of water sources with nitrates (Gibson & Smiley, 2009).

In this context, a comprehensive review of the benefits and potential hazards of fertilizers in apricot production is critical to develop more sustainable agricultural practices and minimize environmental impacts. In this article, the types, benefits and potential hazards of fertilizers used in apricot production in Turkey will be discussed in detail.

## II. FERTILIZERS USED IN APRICOT PRODUCTION AND THEIR BENEFITS

### 2.1. Organic Fertilizers

Organic fertilizers are derived from organic matter and play an important role in improving soil health. Organic fertilizers commonly used in apricot production in Turkey include compost, farmyard manure and green manures.

- **Compost:** Compost made from decomposed plant and animal waste improves soil structure, increases water holding capacity and enriches soil nutrients (Harris et al., 2000). The use of compost increases the biological activity of the soil and helps plants grow healthier.
- **Farm Manure:** Animal manure contains essential nutrients such as nitrogen, phosphorus and potassium. It supports root development of apricot trees and increases the nutrient content of the soil (Kumar et al., 2010). In addition, farm manure, which is rich in organic matter, increases the water holding capacity of the soil and reduces water stress of plants during dry periods.
- **Green Fertilizers:** Green fertilizers, especially leguminous plants, add organic matter to the soil and fix nitrogen. These fertilizers improve soil fertility and support sustainable agricultural practices (Drinkwater et al., 1998).

### 2.2. Chemical Fertilizers

Chemical fertilizers provide fast and targeted nutrition of plants. The most commonly used chemical fertilizers in apricot production include nitrogen, phosphorus and potassium fertilizers.

- **Nitrogen Fertilizers:** Nitrogen is a critical element for plant growth and is usually applied in formulas such as ammonium nitrate, urea or ammonium sulfate. Nitrogen fertilizers increase the development of the green parts of apricot trees and fruit yield (Fageria, 2001).
- **Phosphorus Fertilizers:** Phosphorus is essential for root development and flowering. Phosphorus fertilizers strengthen the root systems of apricot trees and improve fruit quality (Marschner, 1995). Products such as TSP (triple super phosphate) and DAP (diammonium phosphate) are commonly used.
- **Potassium Fertilizers:** Potassium regulates the water balance of plants and improves fruit quality. Potassium fertilizers improve the size and taste quality of apricot fruits (Mengel & Kirkby, 2001). Products such as KCl (potassium chloride) and K<sub>2</sub>SO<sub>4</sub> (potassium sulphate) are used.

### III. HARMS AND POTENTIAL PROBLEMS

#### 3.1. Soil and Water Pollution

Excessive use of chemical fertilizers can cause soil and water pollution. Excessive use of chemical fertilizers leads to leaching of nitrates and phosphates into groundwater sources and thus to water pollution (Moss et al., 1996). Nitrate pollution can affect drinking water quality and cause health problems.

#### 3.2. Deterioration of Soil Health

Prolonged and high doses of chemical fertilizers can reduce soil organic matter and microbial diversity. This can negatively affect the water holding capacity and structure of the soil, which can lead to erosion and reduced soil fertility (Bünemann et al., 2006).

#### 3.3. Economic Costs

The cost of chemical fertilizers is high and overuse can be an economic burden for farmers. In addition, yield losses due to over-fertilization can negatively affect farmers' financial situation (Fageria et al., 2008).

#### 3.4. Environmental Impacts

The misuse of fertilizers, especially nitrogen fertilizers, can increase the release of greenhouse gases. Nitrogen oxides can have an impact on global warming and cause environmental problems (Lal, 2004).

### IV. CONCLUSION

Both types of fertilizers used in apricot production in Turkey have significant effects on plant growth and productivity. Organic fertilizers support soil health and ecosystem balance, while chemical fertilizers provide rapid and targeted nutrient support. Organic fertilizers have the potential to improve long-term soil fertility and sustainability. Organic fertilizers such as compost, farmyard manure and green manures improve soil structure and support biodiversity. However, timely and adequate use of these fertilizers is essential to achieve effective results.

Chemical fertilizers ensure that plants quickly receive the necessary nutrients, which supports short-term yield increases. The application of nitrogen, phosphorus and potassium fertilizers in the correct dosages promotes healthy growth of apricot trees and the production of high-quality fruit. However, overuse of chemical fertilizers can cause soil and water pollution, which brings environmental problems.

The most important aspect of fertilizer use is a balanced application strategy. A balanced use of organic

and chemical fertilizers both protects the long-term health of the soil and increases productivity. In addition, to minimize the environmental impact of fertilizers, recommended dosages should be followed and correct application techniques should be used.

In conclusion, in order to maximize the benefits and minimize the possible damages of fertilizers used in apricot production in Turkey, it is of great importance to focus on sustainable agricultural practices. Scientific research and experience can help identify the best practices in fertilizer use so that both economic and environmental goals can be achieved.

## REFERENCES

1. Anonymous. (2021). *Turkey Apricot Production Report*. Ministry of Agriculture and Forestry.
2. Brady, N. C., & Weil, R. R. (2008). *The Nature and Properties of Soils*. Pearson Education.
3. Bünemann, E. K., Schwenke, G. D., & Barraclough, D. (2006). Impact of agricultural practices on soil organic matter. *Soil Use and Management*, 22(3), 261-273.
4. Drinkwater, L. E., Snapp, S. S., & Coyne, M. S. (1998). Nitrogen dynamics in a long- term corn-soybean rotation experiment. *Agronomy Journal*, 90(3), 479-486.
5. Fageria, N. K. (2001). Nitrogen management in crop production. *Food Products Press*.
6. Fageria, N. K., Baligar, V. C., & Clark, R. B. (2008). *Growth and Mineral Nutrition of Field Crops*. CRC Press.
7. Fageria, N. K., Baligar, V. C., & Clark, R. B. (2008). Physical, chemical, and biological properties of soils. In: *Growth and Mineral Nutrition of Field Crops*. CRC Press.
8. Gibson, R. L., & Smiley, R. (2009). *Nutrient Management for Sustainable Agriculture*. Springer.
9. Harris, J. A., Scull, N. D., & Munro, R. (2000). The role of compost in soil fertility. *Soil Science Society of America Journal*, 64(3), 1068-1077.
10. Kumar, V., Gupta, S., & Kaur, J. (2010). Use of organic and inorganic fertilizers in agricultural practices. *Agricultural Sciences*, 2(2), 110-118.
11. Lal, R. (2004). Soil carbon sequestration impacts on global climate change and food security. *Science*, 304(5677), 1623-1627.
12. Marschner, H. (1995). *Mineral Nutrition of Higher Plants*. Academic Press.
13. Mengel, K., & Kirkby, E. A. (2001). *Principles of Plant Nutrition*. Kluwer Academic Publishers.
14. Moss, B., Stansfield, J., & Jefferies, D. (1996). The role of phosphorus and nitrogen in eutrophication. *Environmental Pollution*, 92(3), 315-323.