



# Fidelik Harcına Uygulanan Bazı Bitki Besin Elementlerinin Fide Kalitesi Üzerine Etkileri

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## Öz

Bu çalışma 2019 yılında Ege Üniversitesi Ziraat Fakültesi Tarla Bitkileri Bölümü fideliginde fidelik harcına uygulanan farklı bitki besin elementlerinin fide kalitesi üzerine etkilerini belirlemek amacıyla yürütülmüştür. İzmir-Özbaş tütün çeşidinin kullanıldığı araştırma Tesadüf parselleri deneme desenine göre 3 tekerrürlü olarak yürütülmüştür. Çalışmada, fide boyu (cm), yaprak sayısı (adet/bitki), gövde çapı (mm), fide sayısı (adet/m<sup>2</sup>), kök uzunluğu (cm), yaş gövde ve kök ağırlığı (g/bitki), kuru gövde ve kök ağırlığı (g/bitki) gibi özellikler incelenmiştir. Araştırma sonuçlarına göre, en uzun fide boyu 20.5 cm, en geniş gövde çapı 4.1 mm ile K2 (400 g/parsel) potasyum dozunda bulunmuştur. Yaprak sayısı 7.8-8.4 adet/bitki, fide sayısı, 2.1-3.3 adet/m<sup>2</sup> ve kök uzunluğu 2.6-2.8 cm aralığında saptanmıştır. Sonuçlar dikkate alındığında uygulanan potasyum dozu ile fide boyu, gövde çapı ve kök uzunluğu artmıştır.

**Anahtar Sözcükler:** Tütün, Gübreleme, Fide, Kalite

## Effects of Some Plant Nutrients Applied to Seedbed Compost on Seedling Quality

### Abstract

This study was carried out to determine the effects of some plant nutrients applied to seedbed compost on seedling quality in 2019 in the seedbed of Ege University, Faculty of Agriculture, Department of Field Crops, in Turkey. In the trial İzmir-Ozbas tobacco variety was used and experimental design was randomized complete parcel design with three replications. In the study, length of the seedling (cm), number of the leaf (per/plant), stem diameter (mm), healthy seedlings per square (pcs/m<sup>2</sup>), length of the root (cm), fresh stem and root weight (g/plant), dry stem and root weight (g/plant) were evaluated. According to the results, the longest length of seedling and stem diameter was found in K2 doses (potassium doses: 400 g/parcel) as 20.5 cm and 4.1 mm, respectively. Besides, number of the leaf, healthy seedling per square and length of the root were 7.8-8.4 per/plant, 2.1-3.3 pcs/m<sup>2</sup>, 2.6-2.8 cm, respectively. Considering the results, as the amount of potassium applied increased, the amount of length of the seedling, stem diameter and length of the root increased as well.

**Key words:** Tobacco, Fertilizer, Seedling, Quality

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## 1. Introduction

Tobacco is an industrial plant of great economic importance in the world and in Turkey. This plant provides wide employment opportunities to a certain group of people from production to evaluation stage and it has been grown in various regions of family agriculture due to its suitability for the ecological conditions and social structure of our country (Ekren, 2007).

In Turkey, oriental tobaccos is grown in six regions in Turkey. Considering the tobacco production properties in these regions, approximately Aegean (75%), Black Sea (11%), South East Anatolia (10%), Marmara (3%), Mediterranean (1%). In addition to this, Aegean Region has an important place in terms of foreign sales (Anonymous, 2018).

Aegean tobaccos are grown in the region with the local name of Aegean Region tobaccos. The type has been cultivated in this region for more than 150 year (Wolf, 1962). Small leaf oriental or aromatic tobaccos and very small amounts of large leaf tobaccos has grown in our country because of suitable for soil type and climatic conditions. The harvested tobacco leaves are sun-cured and characteristics golden yellow leaves have a high aroma and low total alkaloid (nicotine) content. (Gumus Guler, 2008).

The sort of the leaf and the quantity of each in the blend also affect the smoking quality extensively. Minerals which are mainly in charge of promoting the growth and the development of plants have to responsibility to maintain or to increase the quality by controlling the growth in the production. When tobacco is smoked, parts of the mineral matters in different forms directly or indirectly are transferred to the smoke. Some of them are collected in the ash. Tobaccos having high percentage of alkali metals, e.g. Ca, K and Mg are responsible for high ash contents in tobacco types. The minerals directly or organic compound structures indirectly affect the smoking quality of tobaccos and also affect the physical, chemical and quality characteristics of the leaves either positively or negatively (Sekin et al., 2002).

The aim of this research was to determine the effects of plant nutrients on seedling quality in tobacco cultivation.

## 2. Material and Method

The study was conducted in 2018-19 in the seedbed at the outdoor condition of Bornova-Izmir province. Izmir-Ozbas tobacco cultivar was used as a material in the experiment. Average temperature and total rainfall are presented in Figure 1 and 2.

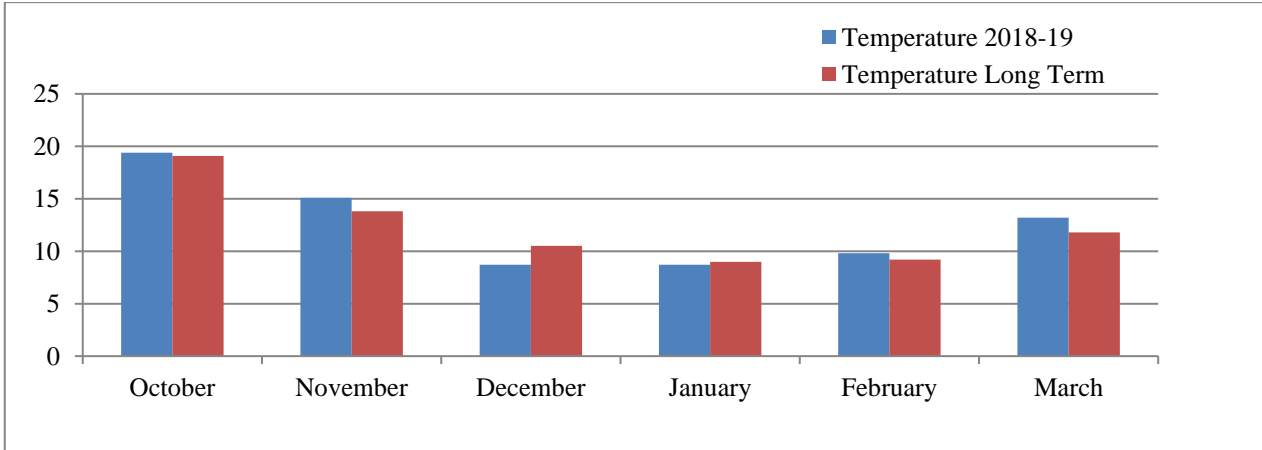


Figure 1. Monthly average temperature in Bornova location

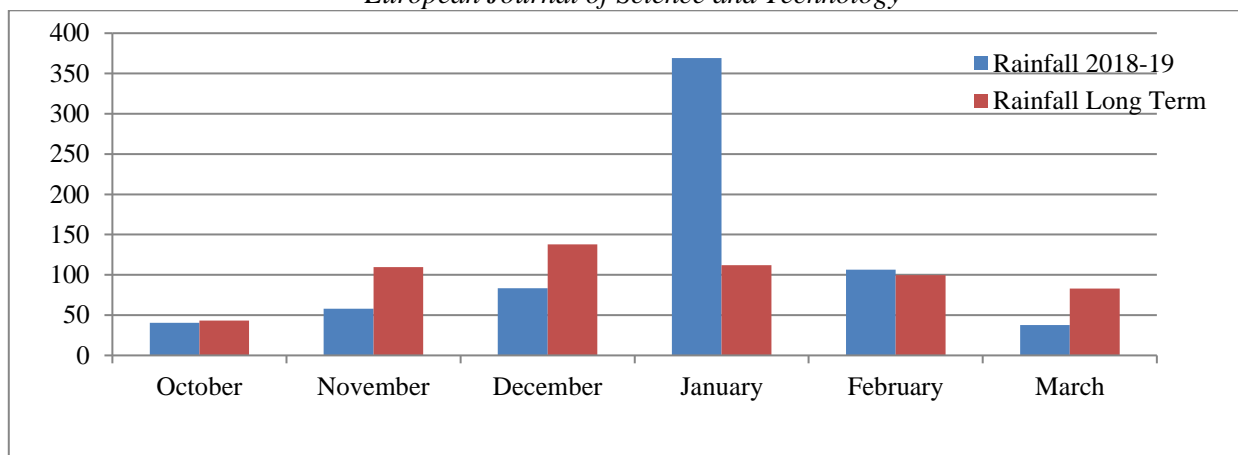


Figure 2. Montly average rainfall in Bornova location

Seedbed oriented in an east-west direction. Seedbed dimension: width: 1.10m, length: 10m and height: 20 cm. The seeds with ash mixture were sown ( $1\text{g m}^{-2}$ ) on the 7<sup>th</sup> December 2018 into a mixture of sand, manure and mulch (1:1:1). The experiment was designed in a randomized complete parcel design with three replications. Each plot 35x110 cm. In the experiment, tobacco plants were applied with N, P, K fertilizers during seedbed (Table 1). Nitrogene and phosphorus doses were kept fixed the potassium doses K0 (control), K1 (200 g/parcel) and K2 (400 g/parcel) were applied.

Table 1. Period of treatment with fertilizers

Fertilizers	Seedbed Period
Ammonium sulfate	Added to the mixture before sowing (8 kg/da)
Di ammonium phosphate (DAP)	Added to the mixture before sowing (10 kg/da)
Potassium sulfate ( $\text{K}_2\text{SO}_4$ )	Added to the mixture before sowing (15 kg/da)

In this study some features were determined such as lenght of the seedling (cm), number of the leaf (per/plant), stem diameter (mm, healthy seedlings per square ( $\text{pcs/m}^2$ ), lenght of the root (cm),fresh stem and root weight (g/plant), dry stem and root weight (g/plant) (Ekren and İlker, 2017).

*Statistical analysis:* The data for all traits were analyzed by the analysis of variance by Acikgoz et al. (2004).

### 3. Research Results and Discussion

Tobacco plants can build up reserve of potassium in the early stages of growth. Tobacco quality may continue to improve as a results of additional rates of potassium beyond those needed for maximum yield. It was understood that potassium doses applied did not have any significant effect on lenght of the seedling, number of the leaves, stem diameter, lenght of the root, fresh and dry stem weight and fresh and dry root weight. In our study, there were statistically significant differences for Healthy seedlings per square in terms of potassium doses.

The longest lenght of the seedling was found K2 doses as 20.5 cm. When we compared to the application doses, lenght of the seedling was increased by appling potassium (Figure 3).

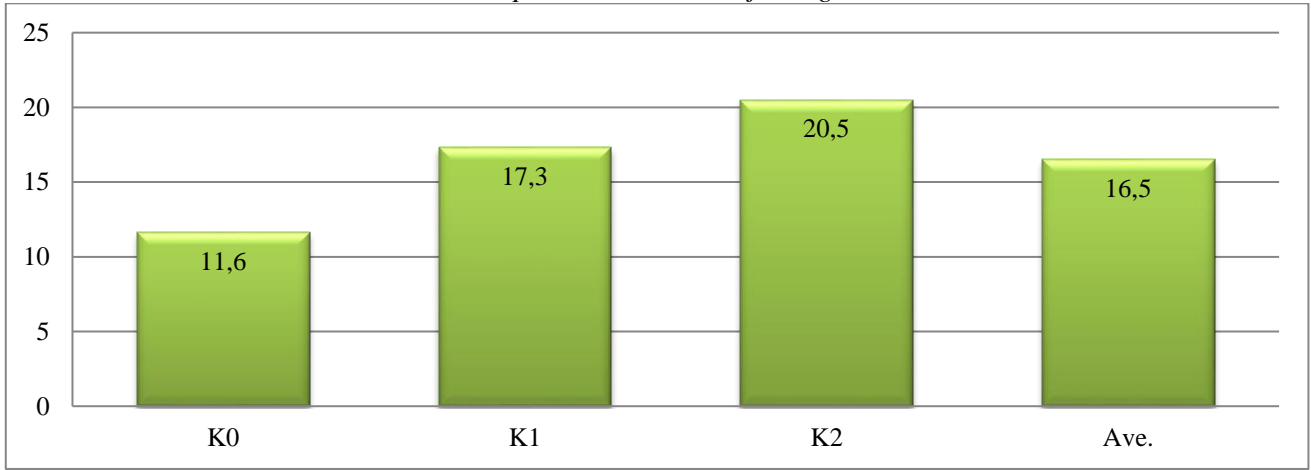


Figure 3. Effects of different potassium doses on length of the seedling (cm)

Pearce et al., (2005) indicates that length of the seedling mostly depends on number of the plants per m<sup>2</sup>, agro-technological measures and technology of seedlings production. In other researchs, length of the seedling was determined between 6 and 21 cm (Turi et al., 2004; Ayan and Caliskan, 2006; Hou-Long et al., 2014, Ekren and Ilker, 2017). The results were consistent with these scientists.

Number of the leaf was determined between 7.8-8.4 pcs/plant and average was 8.1 pcs/plant (Figure 4).

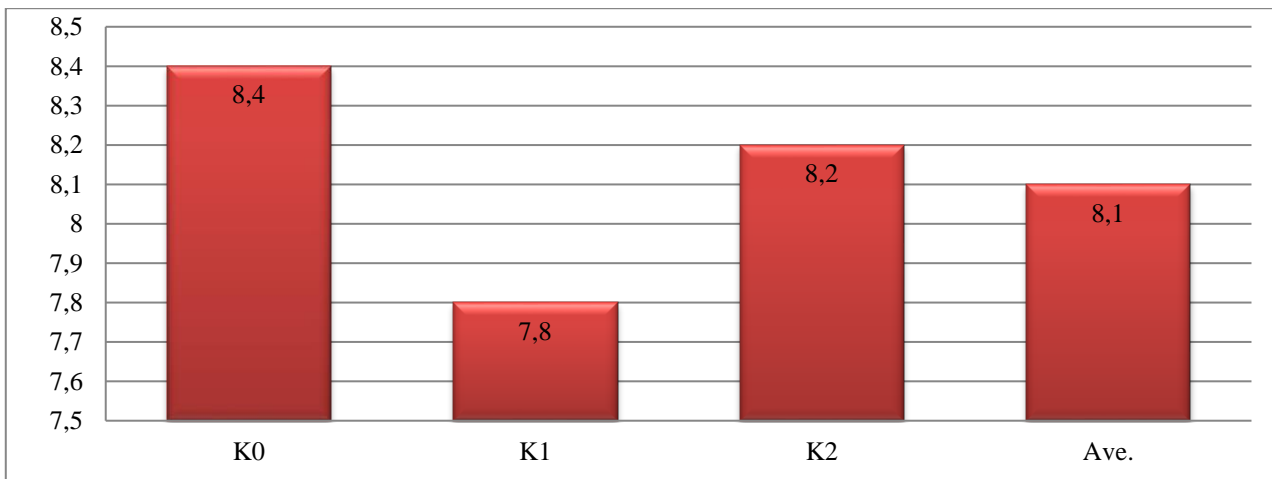


Figure 4. Effects of different potassium doses on number of the leaf (per/plant)

The lowest stem diameter was obtained in K0, the highest was found in K2. Average stem diameter was measured 3.9 mm (Figure 5). Stem diameter was found between 2.6 mm and 5.7 mm in Prilep NS72 and Yaka 125/3 tobacco types (Kabranavo et al., 2014, Turi et al., 2004). Our research results were higher than these scientists since the stem diameter has been affected by the tobacco variety which was used.

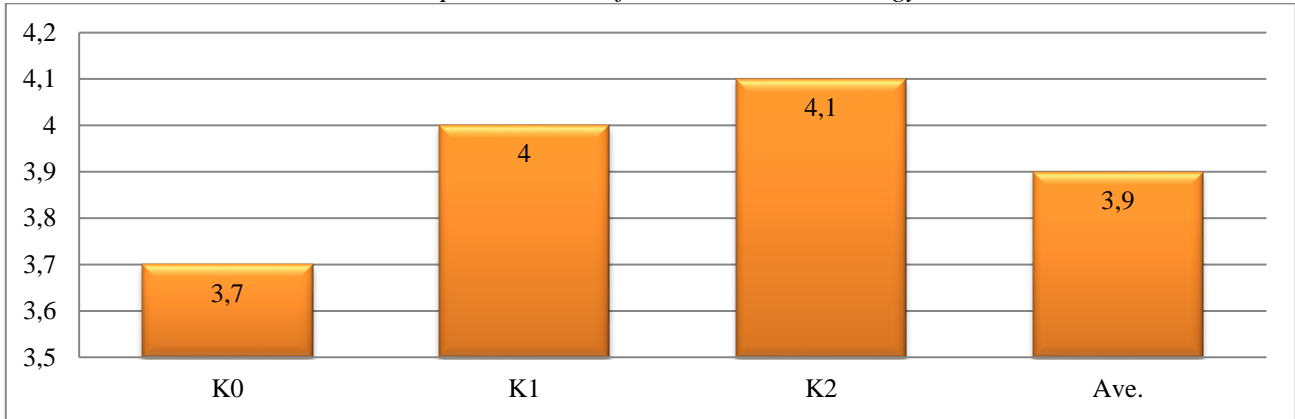


Figure 5. Effects of different potassium doses on stem diameter (mm)

In this study, healthy seedling per square were significant ( $p < 0.05$ ) in terms of potassium doses. The average results were ranged from 2.1 to 3.3 pcs/plant. The highest results were obtained in K1 as 3.3 pcs/plant (Figure 6).

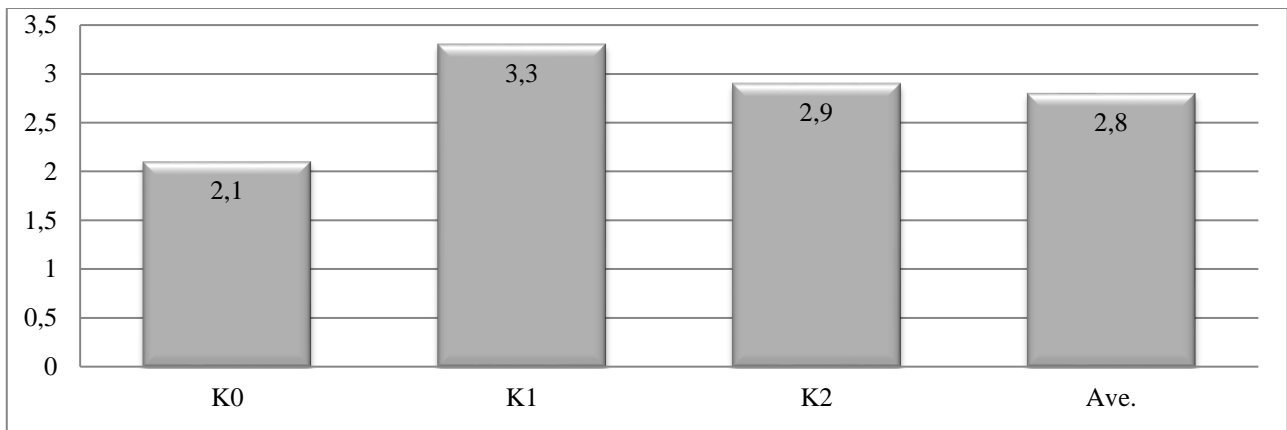


Figure 6. Effects of different potassium doses on healthy seedlings per square (pcs/m<sup>2</sup>)

$p < 0.05$ : 0.757

Ekren and Ilker (2017) was found to be 17.3-24.7 pcs/plant. Our results were lower than these scientist because healthy seedling per square has been affected by sowing time.

As you seen in Figure 7, lenght of the root was obtained between 2.6-2.8 cm. Average result was found in 2.7 cm.

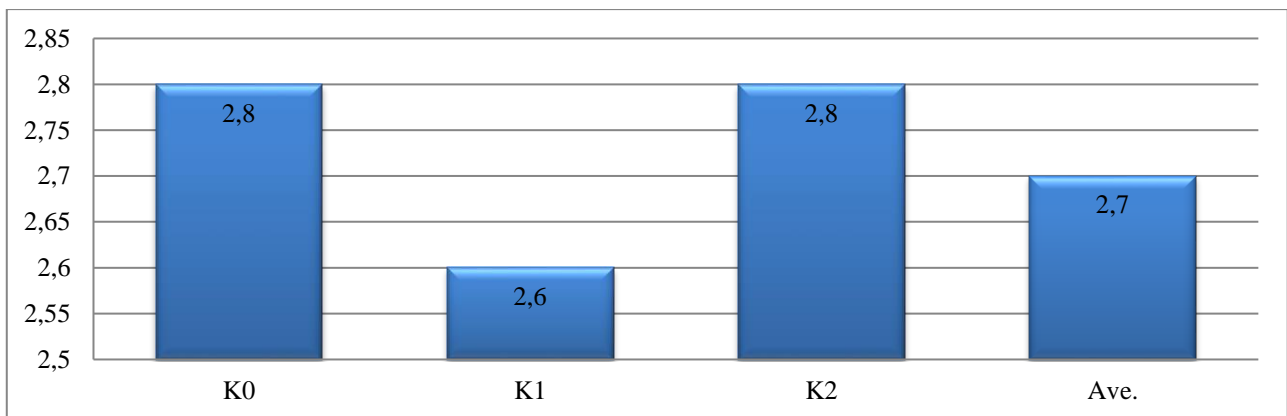
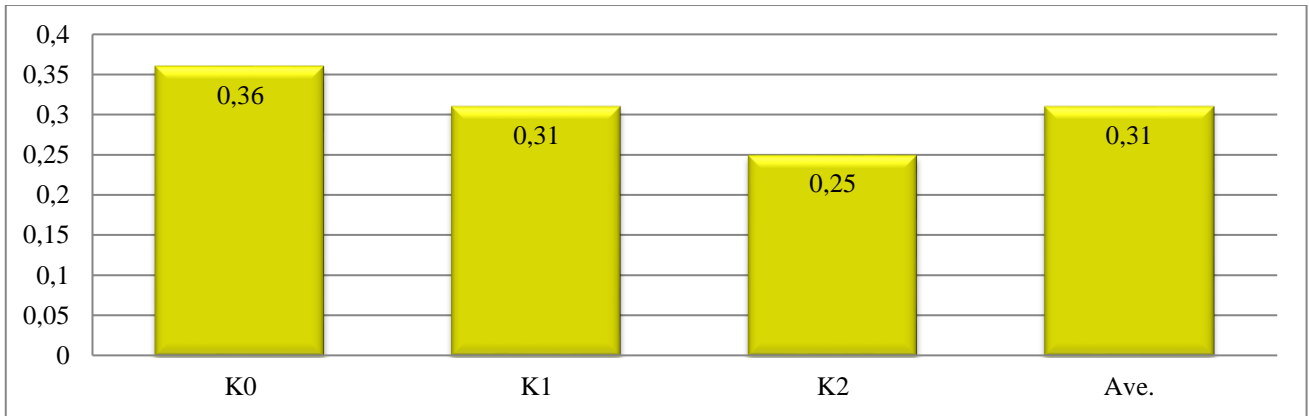


Figure 7. Effects of different potassium doses on lenght of the root (cm)

The results of the fresh and dry stem weight were shown that Figure 8 and 9. The highest weight was found in K0, K1 and K2 potassium doses and average fresh and dry weigh was obtained in 4.4 and 0.31 g/plant, respectively.

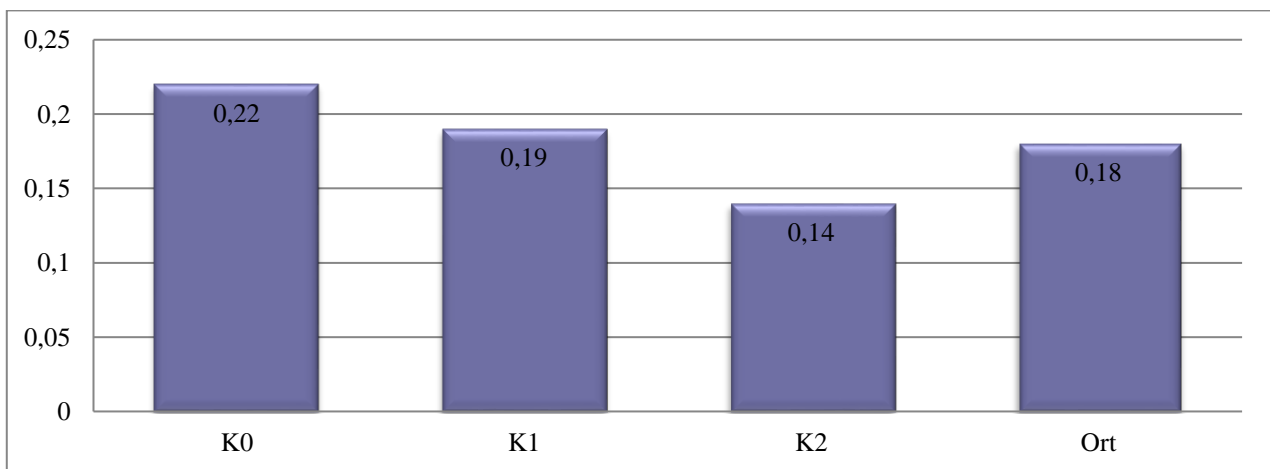


*Figure 8. Effects of different potassium doses on fresh stem weight (g/plant)*



*Figure 9. Effects of different potassium doses on dry stem weight (g/plant)*

When we look at the mean values of the varieties in fresh and dry root weight was changed between 0.14-0.22 g/plant and 0.023-0.036 g/plant, respectively. The lowest results was obtained in K2 being 0.25 g/plant but in dry root weight was found in K1 potassium doses being 0.023 g/plant (Figure 10, 11).



*Figure 10. Effects of different potassium doses on fresh root weight (g/plant).*

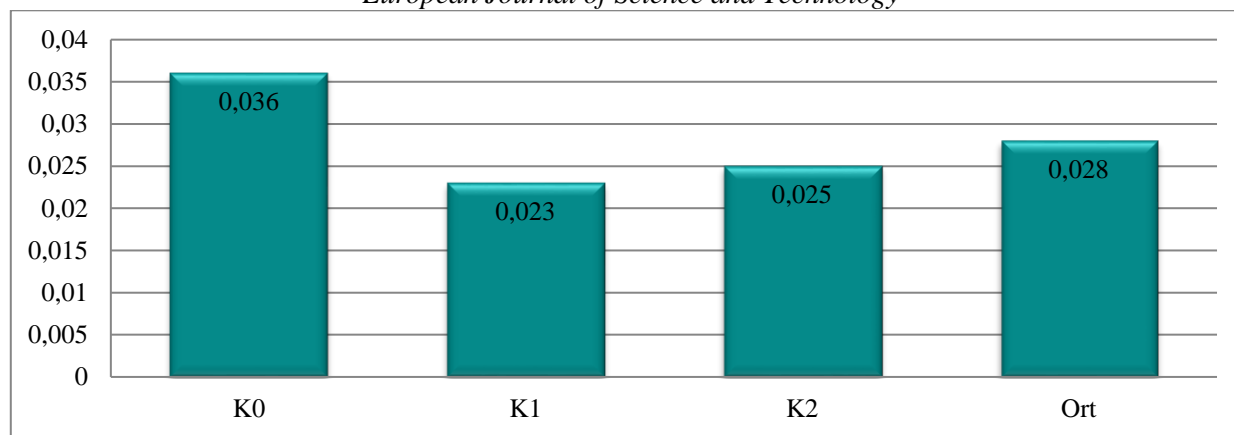


Figure 11. Effects of different potassium doses on dry root weight (g/plant).

To the author's knowledge, there is no previous study about number of the leaves, length of the root, fresh and dry stem weight as well as fresh and dry root weight at seedbed period of Aegean Region tobaccos.

#### 4. Conclusion

In consideration of data; as the amount of potassium applied increased, the amount of length of the seedling, stem diameter and length of the root increased as well. I believe that it will be appropriate to interpret the yield, yield components and quality parameters in the field conditions of these plants determined by seedling performance.

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