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Ministry of Forest and
Water Affairs







THE COMPARISON OF SOILS BETWEEN THE POPLAR PLANTATION AREA AND CORN AND HAZELNUT CULTIVATED AREAS BASED ON SOME PLANT NUTRIENTS

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In Sakarya Province, Poplar 19 years old, 2 year aged Samsun Seedlings, 6x6m intervals.


The Hazelnut 5x5m intervals.


There are 40 hazelnut trees with multi stems in an acre. Every year in early spring 40 kg of DPA fertilizer is implemented in an acre.

Irrigation was carried out only once at the end of the June.

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The Poplar area located in Duzce Province was established Samsun clones; with 2 years aged Samsun seedlings in 6x5m gaps.


Hazelnut area is 25 years old and is fertilized every year with 26 % w/v 30 kg of ammonium nitrate.

In Corn cultivated areas, in the first weeks of November and may 26% 35 kg of ammonium nitrate and 20-20-0 (N-P-O) compound fertilizer were given but no irrigation was carried out.

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36 soils were digged.


the depth 0-30 cm, 30-60 cm and 60-90 cm

Poplar, Corn and Hazelnut located adjacently, 3 holes were digged per plant species and of the 3 depth zones totally 216 soil samples were taken.

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In each of the soil samples

nitrojen (%),

phosphorus (ppm),

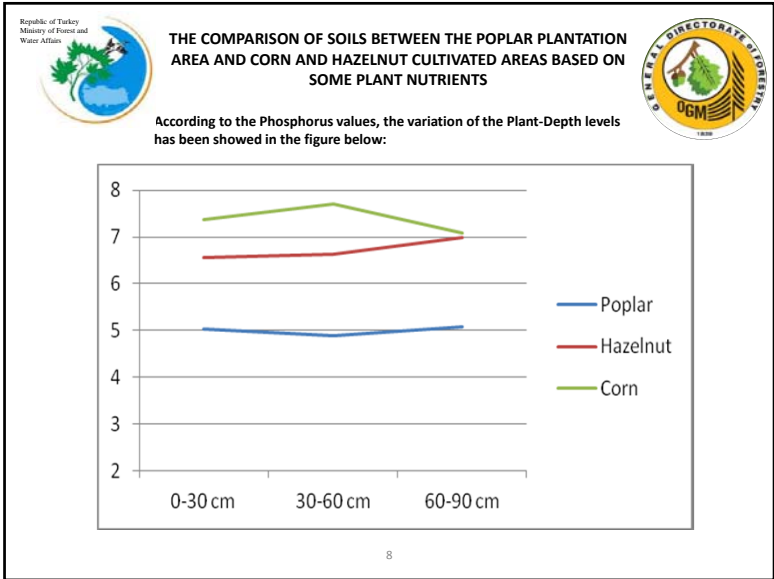
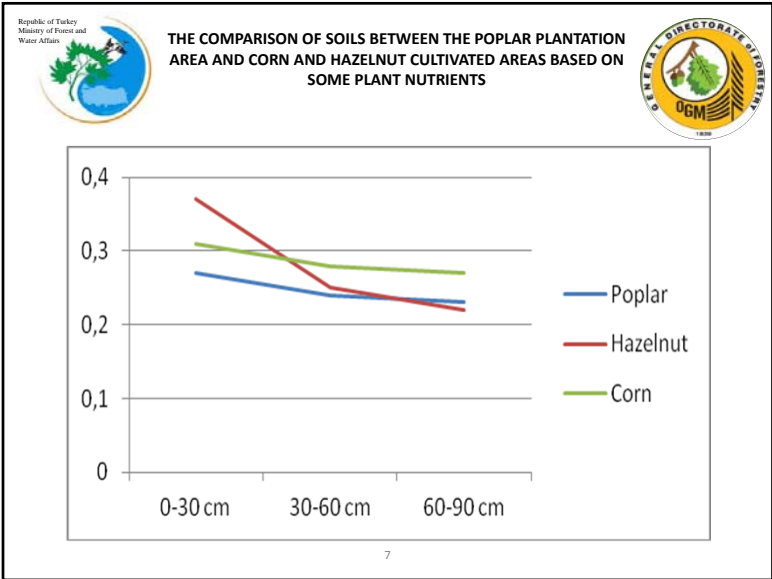
potassium (ppm),


Calcium (ppm),

magnesium (ppm)


sodium (ppm)

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Potassium values, there are significant differences at the level of 0.1% within plant species (Corn, Hazelnut and Poplar) and depth zones statistically. According to the interaction between plant and depth levels, it has been shown that there is no statistical difference.

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Variance Analysis results on Calcium values, within plant species (Corn, Hazelnut, and Poplar) and in the interaction between plant and depth levels there is no significant statistical difference.

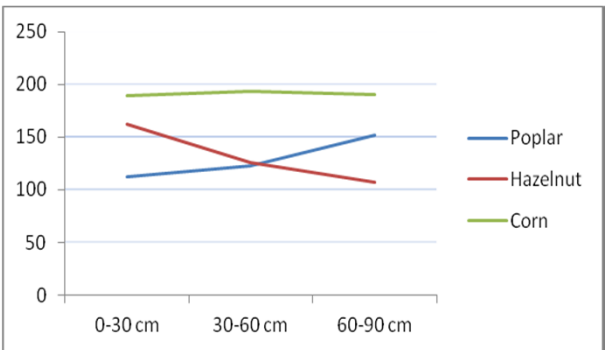
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Magnesium values, the variation of the Plant-Depth levels has been showed in the figure below:




Plant Species	0-30 cm	30-60 cm	60-90 cm
Poplar	~110	~125	~150
Hazelnut	~160	~130	~100
Corn	~190	~195	~190

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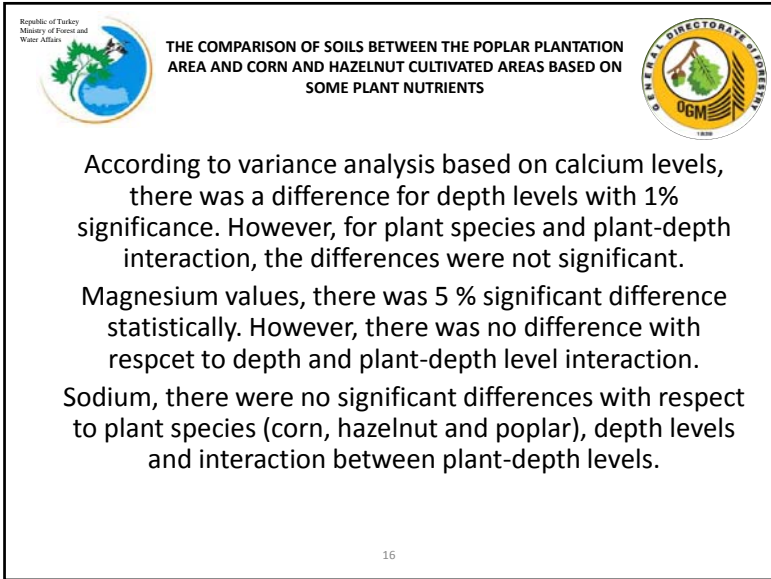
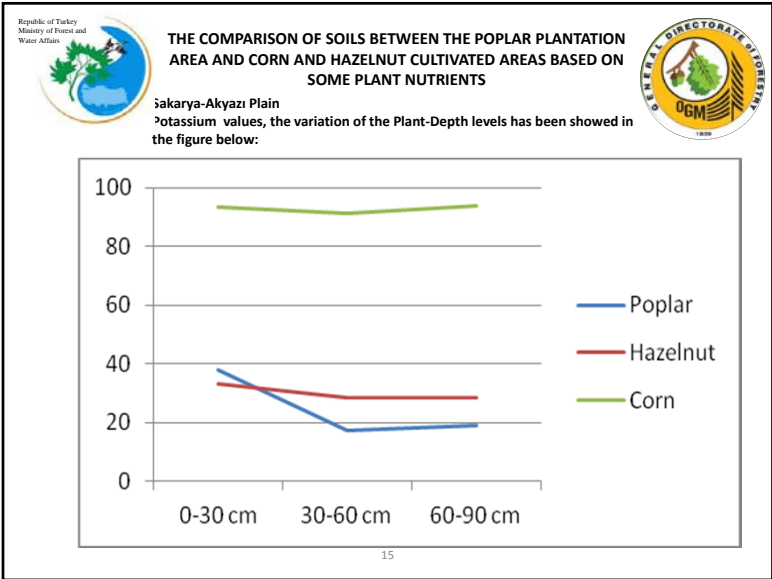
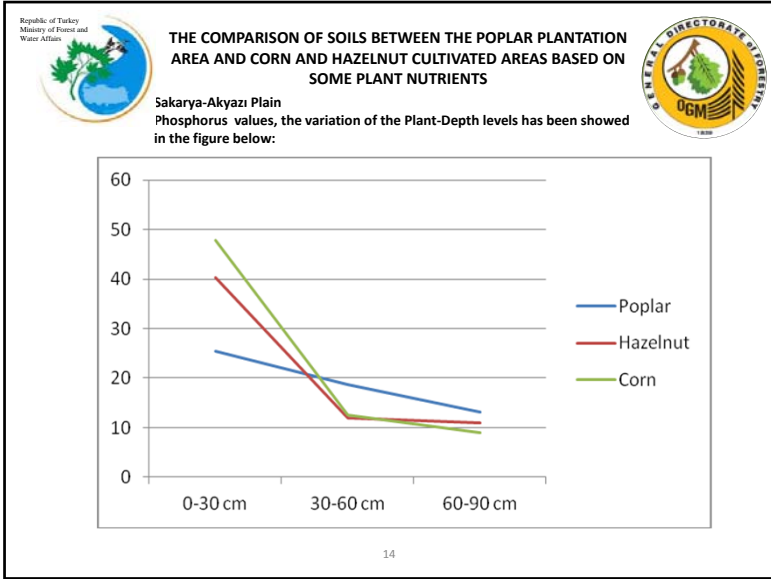
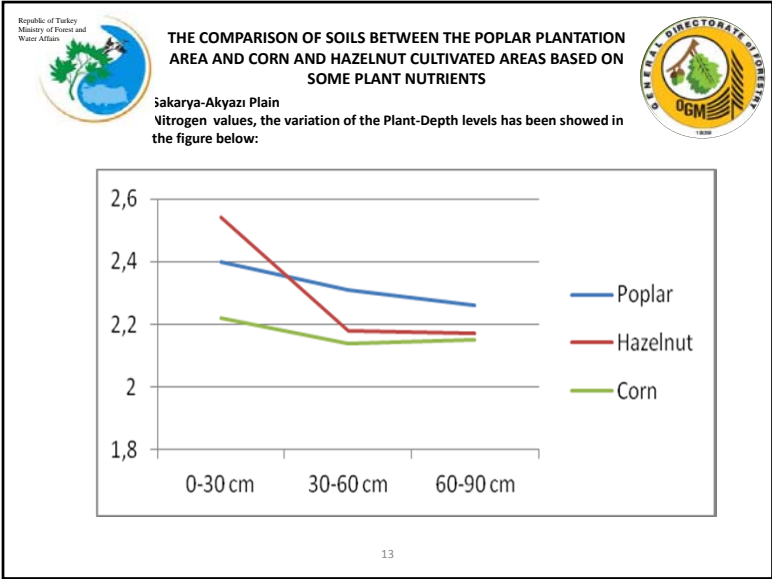



The amount of Potassium in the soils of Düzce test field is higher in the Corn located area than other places where Poplar and Hazelnut .

When The Magnesium concentration in Corn located area show decrease from the upper side of the soil to the depth level of 60-90 cm, it shows increase in Poplar cultivated places in the same direction.

Sodium values, within plant species (Corn, Hazelnut, and Poplar) statistically significant difference has been appeared at the level of 5%.


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Discussion and Conclusion

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According to these results, it might be expressed that poplar trees does not have any effect on nitrogen deficiency; indeed annual corn and hazelnut harvest consume more nitrogen than poplar.

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Phosphorus concentration in soil of Düzce test field was the highest in corn cultivated area which was followed hazelnut and poplar cultivated areas in decreasing order.


There was no statistical difference between plant species in Sakarya. In both test fields, as depth of soil increased, phosphorus level decreased.

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In this study, potassium amount in the soils of test fields show differences depending upon corn, hazelnut and poplar species and upon soil depths.

According to obtained potassium values, the lowest levels were seen in hazelnut planted areas in Düzce and poplar areas in Sakarya-Akyazi.

However, the highest concentrations were obtained in poplar planted areas in Düzce and corn cultivated areas in Sakarya-Akyazi.

This situation might especially be correlated with poplar afforestation and insufficient soil cultivation in hazelnut areas.



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In test fields, potassium utilization was found to be different. This difference was determined by different soil cultivation methods, clay amount in soils and depths of clay in the soil. Both test fields there was a proportional relationship between clay amount and potassium concentration.



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Due to high concentration of clay in our soils, calcium concentration was also found to be high. Moreover, the differences due to soil depths do not depend on plant calcium intake and might be due to different cultural processes.



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Retention of magnesium in the soil depends upon soil texture and structure. Especially, soil colloidal complex influences the retained magnesium concentration. Magnesium concentration in test fields was found less than calcium but more than potassium. Magnesium concentrations in the study were determined as the fact that in Düzce, it was at the highest level in the test field where corn is cultivated but in Akyazı, the highest concentration were identified in test field where hazelnut is planted. In both tests, magnesium concentration was found at the lowest level in areas where poplar is cultivated. Based on these results, poplar takes more magnesium than other plants from soil.

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This shows that when soil cultivation was performed, hazelnut uses less amount of magnesium than corn.

It was detected that in both working plots Poplar trees consume more magnesium, equal amount of copper and less phosphorus than that in corn and hazelnut. This situation might be considered as a fact that corn and hazelnut consume more nitrogen than poplar trees.

Moreover, it was detected that calcium concentration is not affected from plant species and soil cultivation.

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These results also revealed that contrary to popular belief poplar does not exploit plant nutrient components in soil; instead it takes as far as it needs.

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Furthermore, in such studies, through soil analysis based researches, considering purely the concentration of plant nutrient elements in the soil is insufficient, in the meanwhile leaf, root, branch and stem analysis should be preformed for the support of study.

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THANKS FOR YOUR ATTENTION

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