

## P 16. THE PROTECTION OF BEE PRESENCE IN PASTURELAND

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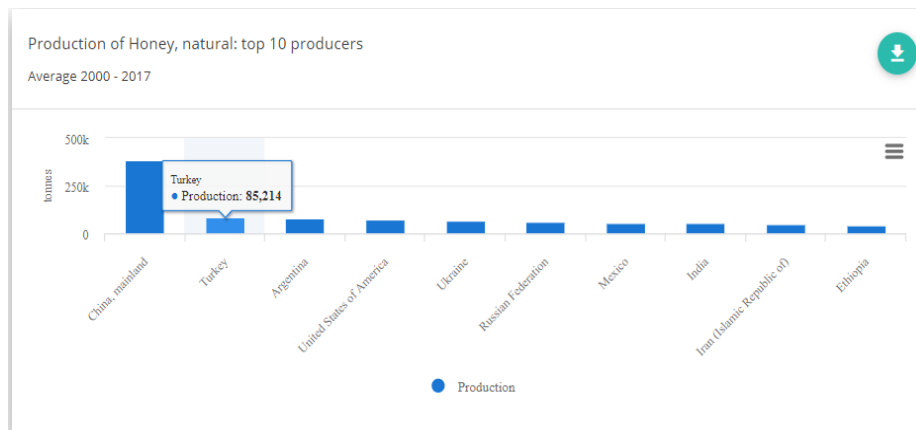
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**ABSTRACT:** The honeybee is vitally important creatures to supply of foodstuffs such as honey, nectar, pollen, royal jelly, etc. and being pollinator of about 77% of 82 plant species which are used as edible in the world. The bee presences are decreased day by day in our country and the whole world due to using pesticide, overgrazing like similar reasons. The pastureland, which is natural areas are not only a forage source for cattle, sheep, and goat, but also these areas provide survival changes of other creatures in nature. Increasing beekeeping activity in rangelands can be obtained to quality honey production from these areas, and enhance to spread of the plants which are pollinated by honeybees in pastureland as the increase in these plants seed yields. For this purpose, forage crops using in rangeland improvement to the protection of bee life and enhancing of bee presence are sainfoin (*Onobrychis sativa*), chickpea milkvetch (*Astragalus cicer*), dandelion (*Taraxacum officinale*), wild rocket (*Diplotaxis tenuifolia*), etc. These forage plants having long blooming period could be meet a nectar needs of the bees. In this review inform about actions to be taken for the protection of bee presence, and forage crops which can be used for that purpose.

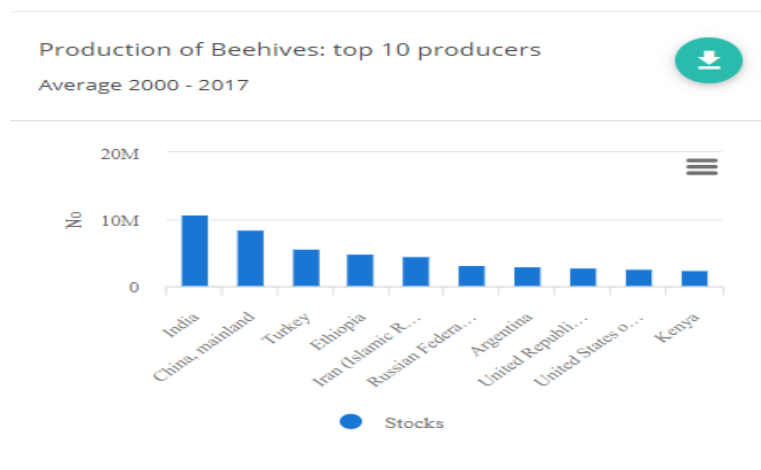
*Keywords: Beekeeping, Forage Crops, Rangeland Improvement, Rangeland Yields*

### 1. PRODUCTION OF HONEY AND BEEHIVES IN THE TURKEY

The honeybee is vitally important creatures to supply of foodstuffs such as honey, nectar, pollen, royal jelly, etc. and being pollinator of about 77% of 82 plant species which are used as edible in the world. In 2017, India was on the first rank in the production of beehives while China (mainland) came in first in the production of honey. In 2017, Turkey came in second in the production of honey, and in third in production of beehives in whole the world (Figure 1-2) (FAOSTAT 2019). In Turkey is produced about 114,471 tons of honey, and is had by 7,9 million beehives. In Turkey, Muğla is on the first rank in the production of hives while Ordu came in first in the production of honey (Table 1) (Anonymous 2018).



**Figure 1.** Production of Honey in the World (FAOSTAT 2019)



**Figure 2.** Production of Beehives in the World (FAOSTAT 2019)

**Table 1.** Production of Beehives and Production of Honey in Turkey (Anonymous 2018)

Production of Beehives			Production of Honey		
Province	% in Turkey	No	Province	% in Turkey	Tons
Muğla	12	958000	Ordu	14,7	16800
Ordu	7	562000	Muğla	13,9	15900
Adana	5,7	455000	Adana	9,4	10700
Aydın	3,5	279417	Aydın	3,8	4343
Mersin	3,4	271433	Mersin	3,4	3886
Antalya	2,8	223533	Sivas	3,2	3657
İzmir	2,7	215550	Balıkesir	2,5	2857
Sivas	2,7	215550	İzmir	2,5	2857
Balıkesir	2,1	167650	Antalya	2,2	2514
Trabzon	2,1	167650	Van	1,7	1943
Total	44	3515783,33	Total	57,3	65457
Production of Beehives in Turkey		7,900,000	Production of Honey in Turkey		114,471

## 2. SOME NECTAR AND POLLEN PLANTS IN TURKEY

The bee presences are decreased day by day in our country and the whole world due to using pesticide, overgrazing like similar reasons. In the world should be increased to the density of plants which are nectar and pollen source in their habitat for preventing to increasing bee death. In Turkey's Flora have grant plant diversity (i.e., about 12 thousand plants), and the rangelands in our country are habitat to part of these plants (Avcı 2005, 2013). The pastures are essential areas in terms of beekeeping and quality fodder in animal production owing to a plentiful variety of species. It is one of the crucial issues that the nectar and pollen plants cannot damage other creatures to live in there. In this review is given in Table 2 to had access to 34 nectar and pollen plants which have feed value or not and have not toxic effect in case of grazing, and found naturally in Turkey's pastureland.

**Table 2.** Some nectar and pollen plants which have feed value or not, and found naturally in Turkey's pastureland (Derived from Karaca et al. 2008, Özhatay et al. 2016, Anomim 2019)

No	Name	Source of Pollen/ Nectar	Blooming Period
1	<i>Alcea pallida</i>	Pollen & Nectar	June- October
2	<i>Astragalus cicer</i>	Pollen & Nectar	May- July
3	<i>Ballota acetabulosa</i>	Nectar	June- July
4	<i>Bellis pernnis</i>	Pollen	March-August
5	<i>Centaurea triumfettii</i>	Pollen & Nectar	May-August
6	<i>Cichorium intybus</i>	Pollen & Nectar	April- July
7	<i>Diplotaxis tenuifolia</i>	Pollen & Nectar	April- November
8	<i>Dorycnium graecum</i>	Pollen & Nectar	April- August
9	<i>Filipendula vulgaris</i>	Pollen & Nectar	May- July
10	<i>Genista carinalis</i>	Pollen & Nectar	May- June
11	<i>Hedysarum varium</i>	Pollen & Nectar	June- July
12	<i>Lavandula angustifolia</i>	Pollen & Nectar	July- August
13	<i>Lotus corniculatus</i>	Pollen & Nectar	May- September
14	<i>Malva sylvestris</i>	Pollen & Nectar	May-October
15	<i>Onobrychis sativa</i>	Pollen & Nectar	May- June
16	<i>Onobrychis tournefortis</i>	Pollen & Nectar	April- May (June)
17	<i>Ononis natrix</i>	Pollen & Nectar	April- July
18	<i>Origanum vulgare</i>	Nectar	May- October
19	<i>Phlomis armenica</i>	Nectar	June- August (September)
20	<i>Sanguisorba minor</i>	Pollen	June- July
21	<i>Tamarix sp.</i>	Pollen & Nectar	Early Spring- Late Autumn
22	<i>Taraxacum officinale</i>	Pollen & Nectar	May- June
23	<i>Thymus longicaulis</i>	Nectar	April- June
24	<i>Trifolium angustifolium</i>	Pollen & Nectar	March-April
25	<i>Trifolium arvense</i>	Pollen & Nectar	March-May
26	<i>Trifolium constantinopolitanum</i>	Pollen & Nectar	April- June
27	<i>Trifolium fragiferum</i>	Pollen & Nectar	April- August
28	<i>Trifolium nigrescens</i>	Pollen & Nectar	March- October
29	<i>Trifolium pratense</i>	Pollen & Nectar	May- September
30	<i>Trifolium purpureum</i>	Pollen & Nectar	January- July
31	<i>Trifolium repens</i>	Pollen & Nectar	March- September
32	<i>Trifolium resupinatum</i>	Pollen & Nectar	May- June
33	<i>Trifolium uniflorum</i>	Pollen & Nectar	March-May
34	<i>Verbascum bugulifolium</i>	Pollen	April- June

### 3. ACTIONS TO BE TAKEN

Ten provinces, shown in Table 1, are produced 58% of the honey in Turkey, and Konya isn't within these provinces. However, Koç et al. (2018) stated to grow the excellent plant diversity in Konya which have steppe formation. We are the opinion that beekeeping activity should be increased in Konya and like that. For this reason, nectar and pollen plants can be added to pasture mixture in rangeland improvement in this region.

The bee activities can be increased by using honeyed plants such as *Lavandula*, *Genista*, *Tamarix* as hedge plants in pastureland. Also, the beehive can be added to grow in the pollination of nectar and

pollen plants in the pasture mixture during the mellowing period for the spread of seeds in the grazing system. Thus, it can be increased to bee products, and to plant composition in rangeland.

#### **4. CONCLUSION**

The pastureland has a critical role in pollen and nectar source in Turkey. This situation is essential with regards to provide sustainability via natural seeding of rangeland as well as beekeeping. Because the pollination of grazing crops occurs via the bee, this mutual relationship is taken into consideration in range management and especially pasture improvement. We are the opinion to thinking of grazing animals needs in the development of rangeland, which are a vital source for bee, besides thinking of plants which are a benefit to bee, and non-noxious these animals.

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