

EFFECTS OF MIXTURE RATES AND CUTTING DATES ON THE FORAGE YIELD AND QUALITY OF VETCH-TRITICALE MIXTURES AND THEIR SEED YIELDS UNDER LOWLAND CONDITIONS OF CUKUROVA

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ABSTRACT

This study was conducted to determine the effects of mixture rates and cutting dates on the forage yield and quality of vetch-triticale mixtures. Mixtures containing 50% vetch + 50% triticale or 25% vetch + 75 % triticale can be preferred for a high forage yield and the cutting should be performed at the beginning of the pod stage in terms of herbage and hay yield unless there is a necessity for the early harvest. Even if 100 % triticale provided the highest yield 0.98 tonnes/ha of crude protein, the mixture with 25 % +75 % triticale giving 0.96 tonnes/ha yield or 50 % vetch+50 % triticale with 0.89 tonnes/ha yield might be preferred in order to obtain balanced forage composition.

For the seed yield, 25% vetch + 75% triticale mixture (2.1 tonnes/ha triticale + 0.24 tonnes/ha vetch) had more advantage over the other mixtures. This result seems very useful when the harvest for herbage is impossible due to the unfavorable environmental conditions.

KEYWORDS

Vetch-triticale mixtures, yields, Turkey

INTRODUCTION

Cukurova, although still being under some of the improper agricultural practices, has suitable ecological conditions for plant production as well as great potential for intensive animal husbandry (Genc *et al.* 1977). Therefore, it is considered as one of the major agricultural regions of Turkey. However, local farmers in the region continue their tendency of growing cash-crops in a monocultural way. They are skeptical to raise animals due to the higher feed costs as well as the risk factors involved in animal husbandry (Gurgen and Planck, 1989). However ecological conditions of the region are very suitable for growing high yielding and good quality of forages in double-cropping rotation systems (Saglamtimur *et al.* 1988).

In this study, the effects of different vetch + triticale mixture rates and the cutting times on the fodder yield and quality were investigated during winter growing period in Cukurova.

METHOD

This research was conducted on the bottomlands of the Agricultural College, Cukurova University during the growing season commencing in Nov. 1995 and ending in June, 1996. A local cultivar of vetch called "anadolu vetch" and a line 2014 of a triticale were used in this research. A 2x5 factorial design in randomized blocks with four replications was used. Mixture rates were designated as pure vetch, pure triticale, $\frac{1}{4}$ vetch + $\frac{3}{4}$ triticale, $\frac{2}{4}$ vetch + $\frac{2}{4}$ triticale, $\frac{3}{4}$ vetch + $\frac{1}{4}$ triticale. Cutting times included two stages of vetches in the mixtures, namely, flower initiation and pod development stages. Each plot had a 12 square meter area. Seed sowing ratios were calculated by using Genckan's Formula (1985). Sowing seed rates of pure vetch and pure triticale were in turn 12 kg/da and 25 kg/da, respectively.

RESULTS AND DISCUSSION

Green Forage Yield. Significant differences were found on green forage yield for the mixture rates and the interaction between mixture rates and the cutting time. The highest green forage yield (28.9 tonnes/ha) was obtained from the 50 % vetch + 50% triticale mixture but the lowest

yield (21.7 tonnes/ha) from pure vetch sowings (Table 1). In general, mixtures yielded more green forages than the pure stands.

Dried Forage Yield. Dried forage yields were all affected by the mixture rates, cutting times and the interacting factors between them. The highest dried forage yield (8.46 tonnes/ha) was obtained from the mixture of 25% vetch + 75% triticale but the lowest yield (3.92 tonnes/ha) from the pure vetch sowings (Table.1). In general, the second cuts (7.621 tonnes/ha), on the average, produced more dried forage yields than the first cuts (6.42 tonnes/ha). The mixtures having higher rates of triticale yielded more dried forages.

Protein Yield. Mixture rates significantly affected the protein yields. The lowest protein yield (0.54 tonnes/ha) was obtained from the pure vetch sowings but the highest protein yield (0.98 tonnes/ha) was from pure triticale sowings due to higher yields of triticale which also included some seeds (Table. 1).

Seed Yields. Seed yields of the vetches in the mixtures were not statistically significant but the highest vetch seed yield (2.69 tonnes/ha) was obtained from 50% vetch + 50% triticale mixture (Table 1). However, the seed yields of the triticale in the mixtures were statistically significant. The highest triticale seed yield (2.70 tonnes/ha) was obtained from the pure triticale sowing but the lowest (0.98 tonnes/ha) was from 75% vetch + 25% triticale mixture (Table 1).

CONCLUSION

The results showed that the triticale was a promising crop component in the annual legume + cereal mixtures for forage as well as hay production during the winter period of Cukurova. Triticale producing even higher forage as well as protein yields than the commonly used oats and barleys in the region should be a preferable crop species. In addition, it was revealed that the mixtures including 25% or 50% vetches were the higher yielding mixtures when considering the forage yield and the higher protein contents of such mixtures. The results also showed that the dried forage yield, especially in the mixtures including higher rates of triticale, was increased by delaying cutting times but the protein yield was not significantly affected by such delay. However, seed yields of the mixtures could not produce any meaningful differences yet. Therefore, research concerning the seed yields of the different mixture rates of vetch + triticale should be carried out further in the near future.

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Table 1

Mean Yields of Green Forage, Dried Forage, Crude Protein as well as the Seed Yields of Mixture Components in the different Vetch+Triticale Mixtures Harvested in Two Different Dates.

Yield (t/ha)	Cutting Date	Mixtures				
		100 % V	100 % T.	25 % V. 75 % T.	50 % V. 50 % T.	75 % V. 25 % T
Green Forage	Apr.8	26.5 a*	25.6 a	26.7 a	29.0 a	29.9 a
	Apr.23	16.8 b	27.7 a	31.0 a	28.8 a	26.8 a
	Mean	21.7 b ⁺	26.6 a	28.9 a	28.9 a	28.3 a
Dried Forage	Apr. 8	4.24 a	6.86 b	7.04 b	7.25 a	6.81 a
	Apr. 23	3.59 a	9.35 a	9.89 a	8.36 a	6.92 a
	Mean	3.92 c	8.11 a	8.46 a	7.81 a	6.86 b
Crude Protein	Apr. 8	0.61	0.87	0.81	0.84	0.97
	Apr. 23	0.47	1.08	1.12	0.93	0.86
	Mean	0.54 b	0.98 a	0.96 a	0.89 a	0.91 a
Seed of Vetch	May. 10	0.99	-	2.56	2.91	1.87
	June. 5	2.44	-	2.24	2.50	2.62
	Mean	1.71	-	2.40	2.69	2.44
Seed of Trit.	May. 10	-	2.68	1.77	1.43	0.72
	June. 5	-	2.73	2.41	1.30	1.24
	Mean	-	2.70 a	2.10 b	1.37 c	0.98 c

*) Means followed by the same letter for each mixture in each character are not significantly different by the t-test at the $p < 0.05$ level.

+) Means followed by the same letter in each character are not significantly different by Duncan's Multiple Range Test at the $p < 0.05$ level.