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The Effects Of N And P Fertilization On Mıxture, Potassium, Calcium, Magnesium And Crude Protein Rates In Mixed Production

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***Abstract*—This study was conducted to determine the effects of Nitrogen and Phosphorus fertilizers on yield and yield components of intercropped common vetch and triticale in Şanlıurfa. 40 and 60% seed ratio for triticale and common vetch respectively was determined based on the available literature. Seed amount in the mixture of individual plants were determined as considering their sole crop seed amount which are 20 and 10 kg/da for triticale and common vetch respectively. Pure Nitrogen and Phosphorous were applied at rate of 0, 3, 6, 9 and 12 kg/da by using fertilizers in the forms of ammonium sulphate and triple super phosphate fertilizers. Application of nitrogen and phosphorous fertilizers caused a increase in triticale and vetch crude protein ratios, K (%) ratios, Ca (%) ratios and Mg (%) ratios were statistically significant. The highest value for the ratio of crude protein to triticale was obtained from the plot of N9P3 at 16.16% for the average of two years, while the lowest value for crude protein was taken from the N0P0 parcel with 10.84%. In the vetch plant, the highest crude protein ratio was obtained from the N9P3 parcels with 27.26%, while the lowest rate was obtained from the N0P0 parcels with 16.55%. The highest average triticale K ratio was obtained from parcels of N6P12 with 1.24%, ie, 6 kg / da nitrogen and 12 kg / da phosphorus fertilized plots. The ratio of Ca to triticare ranged from 0.07 to 0.14% in the average of two years and the highest triticale Ca value was taken from the N3P6 plot. The highest average tritic to Mg ratio value was obtained from the N3P0 and N12P0 parcels with 0.14%. The highest vetch ratio values were obtained from the N3P12 and N12P6 plots, ie, at 12 and 6 kg / da phosphorus fertilization with 3 and 12 kg / da nitrogen. In contrast to other phosphorus doses, the vecth K ratio at 12 kg / da phosphorus supplementation has shown that there is no benefit to the vesicular ratio of more than 9 kg / da phosphorus dose. Among the characteristics examined, the lowest vetch Ca (%) value was taken from the N6P9 parcel, whereas the highest mean vet Ca ratio (%) value was; 3.75 with N0P3, that is, 3 kg / da phosphorus fertilizer. The highest Mg (%) was obtained from N3P12 plots, ie 3 kg / da nitrogen and 12 kg / da phosphorus fertilization. According to the results of the research, the most suitable fertilizer combination is 9 kg / ha, provided that at least 10 kg / da of phosphorus is found in the soil, in order to obtain the highest yield in mixed cultivation system to be made with 60% Özveren vetch and 40% Tacettinbey tritikale varieties in Şanlıurfa province conditions, nitrogen (N) and 6 kg / da phosphorus (P), respectively. The total amount of phosphorus and half of the amount of nitrogen to be applied and the proportion of nitrogen to the amount of nitrogen to be added in the early seedling stage of the plant after the emergence of the other half of the nitrogen seedlings after the start are determined to be the ratio of triticale and vetch crude protein, K (%), Ca (%) and Mg The effect is considered to be more appropriate as it is statistically significant.**

***Keywords*—Vetch, Triticale, Potassium, Magnesium, Crude Protein Yield component.**

INTRODUCTION

Because our country has not developed as much as its breeding capacity in animal husbandry, the animals are fed on meadow-pasture basis or the quality of animal products is low because the concentrated feeds used for the feeding of animals are not in sufficient quality. For this reason, the nutritional value must be done in order to obtain high and quality yield from our animals which are fed in a balanced manner with high feed plants. It is necessary to improve the pastureland by breeding and preservation of rangeland areas and to graze to the extent of their capacities. In addition, the feed value and digestibility of the hay used in animal feed is low, which causes significant loss of yield in animals. For this reason, increasing the yield increases the doubling of the efficiency of feeding animals with high quality feed, even in farmer conditions, while coarse feed production is a prerequisite.

The triticale and vetch in different agricultural systems are an ideal mixture of feed plants to provide rough and concentrated feed to animals and at the same time to increase the yield of the soil. In addition, the protein content is also very high green and dry weeds, tasty and nutritious for animals. Sowing of legumes and wheatgrass as a mixture requires high sowing rates of the species entering the mixture to obtain high and high quality weed yield. Hatipoğlu et al. (1999), in their studies on the effects of mixture ratio on weed and weed quality in vix + tritikale mixture in Diyarbakir conditions; found that the yield of pure planting was lower than the yield of grass according to the blends. The highest yields of wet and dry hay were obtained from 40% vetch + 60% triticale mixture and the lowest yields of wet and dry hay from pure vetch sowing. The highest protein ratio was obtained from pure vetch, while the highest crude protein yield was obtained from a mixture of 80% vetch + 20% triticale. (2002) found that a mixture of 60% vetch + 40% triticale in terms of hay yield and crude protein yield could be preferred in attempting to determine the effects of mixing ratio and plant density on yield and yield components in the mixed cultivation of triticale and Adi vet, and that the harvest should be done when the lower legs of the harvest begin to be seen. Fertilization will produce products such as meat and milk in higher quantities and in higher quantities than the animals fed with these feeds, while longer green fodder plants with higher quality green fodder produce higher yields. The most important macro elements required for the normal development of plants are nitrogen and phosphorus. The purpose of the study was to investigate the effects of nitrogen and phosphorus fertilization on the ratio of K, Ca, Mg and Crude Protein to the feed mixture needed to meet the quality feed requirement for our region.

MATERİAL And METHODS

Ammonium sulphate containing 21% Nitrogen with physiological acid character and triple superphosphate containing 42% P2O5 as phosphorous fertilizer were used in consideration of regional soil. Sanliurfa is under the influence of the Mediterranean climate, including in the Southeast Anatolia climate region. The summers are hot and the arid winters are a mild climate. Fertilizer doses; Ammonium sulphate fertilizer at 0-3-6-9-12 kg / da pure N and TSP fertilizer at 0-3-6-9-12 kg / da pure P were used in the future. The total amount of P in the fertilizer and half of the amount of N were planted together with planting, while the other half was given in early seedling stage after emergence. The sides of the parcels were removed from the sides and the sides by 20 cm, and the remaining 5.6 m2 area was harvested during the full flowering period of the vetch.

Table 1. Average Climate Values of Şanlıurfa Province (2010-2012) (DMİ, 2013)

		OCTB	NOVEM	DECEMB	JANUA	FEBRUA	MARCH	APRIL	MAY
2010-2011	Ort. Temp. (° C)	21.0	16.5	10.4	7.3	7.6	12.3	15.4	21.3
	Top Load. Temp. (° C)	32.1	28.5	26.0	14.6	17.8	25.2	28.5	34.9
	Most Dream. Warm. (° C)	9.8	8.5	3.0	0.3	-0.9	2.3	4.3	11.3
	Lowest Humidity (%)	10.0	10.0	21.0	41.0	30.0	26.0	28.0	24.0
	Precipitation Topl.Kg / m²	2.3	0.0	72.1	58.0	28.2	42.0	133.7	39.2
2011-2012	Ort. Temp (° C)	19.3	9.4	7.4	5.5	5.8	9.7	19.3	22.4
	Top Load. Temp. (° C)	32.7	21.4	16.0	14.8	16.2	21.3	32.6	33.2
	Most Worst (° C)	8.8	-0.4	0.8	-4.3	-1.9	-1.7	6.6	13.0
	Lowest Humidity (%)	25.0	25.0	29.0	54.0	35.0	25.0	11.0	10.0
	Precipitation Topl.Kg / m²	12.3	62.1	47.1	170.9	95.8	35.8	23.3	42.3

Soil samples were taken from 0-20 and 20-40 cm depths and the following analyzes were carried out to determine some physical and chemical properties of the experimental soil (Tüzüner, 1990).

Soil Reaction (pH): Measured with a glass electrode pH meter from the prepared saturating paste (Chapman and Pratt, 1961).

Total Salt: It was found by using electrical conductivity in the saturating paste with the conductivity tool (Richards, 1954).

Organic Substance: The amount of organic matter contained in the soil was made according to Modified Walkley - Black method (Zabunoglu and Karaçal, 1983).

Lime (CaCO3): The lime amounts of the soil of the test area were found by Scheibler Calcimetres and the result is written as% (Çağlar, 1949).

Total Nitrogen: The total nitrogen content is determined by the Kjeldahl method according to the principle of keeping the ammonia in the boric acid solution (Zabunoglu and Karaçal, 1983).

Available phosphorus: 0.5 M NaHCO3 extract solution with a pH of 8.5 was used according to the method of Olsen et al. (Olsen et al., 1954).

Potable Potassium: The use of 1.0 N Ammonium Acetate Solution (pH 7.0) as an extract solution and the amount of potassium passed to the extract were

measured by Beckman Fleym Photometer (Jakson, 1958)

Table 2. Some Physical and Chemical Properties of Trial Site Soils (0-40 cm)

		Su ile doygun Toprak pH	Tuz (mmhos/cm)	Kireç($CaCO_3$) (%)	Fosfor (P_2O_5) kg/da)	Potasyum (K_2O) (kg/da)	Toplam azot (N)(%)	Organik madde (%)
2010-2011 Yılları	Ekim Öncesi Bloklar							
	1	8.01	0.05	28.3	10.1	90.4	0.13	1.31
	2	7.82	0.04	26.4	11.4	86.4	0.12	1.24
	3	7.84	0.05	28.4	10.6	87.5	0.14	1.38
	Hasat Sonrası Bloklar							
	1	8.07	0.05	31.6	17.0	93.1	0.16	1.59
	2	8.02	0.05	29.1	19.0	91.4	0.16	1.64
	3	7.92	0.06	31.2	15.9	92.2	0.17	1.71
2011-2012 Yılları	Ekim Öncesi Bloklar							
	1	7.75	0.03	27.1	13.2	92.0	0.13	1.26
	2	7.77	0.04	32.3	13.0	86.0	0.14	1.42
	3	8.02	0.05	28.2	11.2	88.0	0.14	1.44
	Hasat Sonrası Bloklar							
	1	8.01	0.04	31.0	15.0	94.0	0.17	1.69
	2	8.01	0.04	34.3	19.0	91.0	0.18	1.81
	3	8.00	0.05	32.5	17.1	91.0	0.20	2.01

Method

Anlarsal and Gulcan, 1988). In this study, we have investigated the relationship between plant height and plant height (T. 1g of the plant samples prepared for analysis were taken and% nitrogen content was determined by Kjeldahl method (Kaçar, 1984). Calculated nitrogen ratios were calculated by multiplying the coefficient of 6.25 in the vetch plant and the coefficient of 5.7 in the triticale plant. The amount of phosphorus was determined by measuring the density of the vegetation produced in the barton solution by using a spectrophotometer (Kaçar, 1984). The amount of potassium in the solution obtained after the incineration was determined by atomic absorption spectrophotometer and the amount of potassium in the plant was determined (Kaçar, 1984). The amount of calcium in the solution obtained after the incineration was read in the atomic absorption spectrophotometer and the amount of calcium in the plant was determined (Kaçar, 1984). The amount of magnesium in the solution obtained after the incineration was determined by atomic absorption spectrophotometer and the amount of magnesium in the plant was determined (Kaçar, 1984).

RESEARCH RESULTS and RESEARCH

1.1. Triticale Crude Protein Ratio (%)

Table 3.1. Mean Values and Groups of Triticale Crude Protein Ratio

	Uygulamalar	P_0	P_3	P_6	P_9	P_{12}	Ort.
1.Yıl	N_0	10.03 fg	12.95 a-d	10.24 a-g	10.50 a-g	10.16 e-g	10.78
	N_3	12.28 a-d	13.76 a-c	10.59 d-g	10.88 c-f	9.40 g	11.38
	N_6	11.87 a-e	13.45 a-d	12.41 a-e	11.73 a-f	13.00 a-e	12.49
	N_9	11.17 b-f	14.52 a	11.65 a-f	11.56 b-f	11.38 b-f	12.06
	N_{12}	12.83 a-e	14.06 ab	10.91 c-g	12.08 a-e	10.64 d-g	12.10
	Ort	11.64	13.75	11.16	11.35	10.92	11.76
2.Yıl	N_0	11.64 g	13.60 e-g	12.81 fg	12.76 fg	11.68 g	12.50
	N_3	13.61 e-g	15.56 a-d	15.00 b-e	14.92 b-e	15.16 b-e	14.85
	N_6	15.28 b-e	18.24 a	16.08 a-d	16.61 a-d	14.07 d-g	16.05
	N_9	15.01 b-e	17.80 ab	16.36 a-d	17.16 a-c	14.62 c-f	16.19
	N_{12}	14.04 d-g	17.10 a-c	15.92 a-d	15.16 b-e	13.59 e-g	15.16
	Ort	13.92	16.46	15.24	15.32	13.83	14.95
2 Yıl Birleşik	N_0	10.84	13.28	11.53	11.64	10.92	11.64
	N_3	12.95	14.66	12.80	12.90	12.28	13.12
	N_6	13.57	15.84	14.24	14.17	13.53	14.28
	N_9	13.09	16.16	14.01	14.36	13.00	14.12
	N_{12}	13.44	15.58	13.42	13.63	12.12	13.64
	Ort.	12.77	15.10	13.20	13.33	12.37	13.36

The averages indicated by similar letters are not statistically different within the 5% error limitsstatistically different within the 5% error limits according to the F and LSD test.

Among the characteristics investigated, the lowest ratio of crude protein to biomass taken from two years was obtained from N3P12 with nitrogen fertilization at 12 kg / da phosphorus fertilization and

the highest Crude protein to tritical value was obtained from N6P3 plot with 18.24% . This value followed the N9P3, N9P9 and N12P3 applications with 17.80%, 17.16% and 17.10%, respectively, with insignificant differences. According to the results of F and LSD tests, the two-year mean crude protein ratio values in the N0P0 control plot of the 40% triticale + 60% vetch mixture were 10.84% lower and statistically lower than the crude protein ratios of the different nitrogen and phosphorus- . Aydin and Tosun (1993) reported that nitrogen and phosphorous fertilizers in vetch and barley mixtures significantly increased the yield, quality and crude protein ratio of the mixture. To obtain good quality and high yield, 8-12 kg nitrogen and 6 kg P2O5 / suggesting that phosphorus can be given, which is parallel to our findings.

Öztürk and Serin (1996); reported that they did not have a significant effect on the crude protein ratio of phosphorus fertilizers (0.3, 6, 9 kg P2O5 / da). Sobkowicz and Sniady (1999); increased the proportion of tritiated protein by increasing the amount of nitrogen applied. Karaca and Çimrin (2002); (P <0.01) increased the crude protein ratio of the common vetch + barley mixture to 12.55% denature to 13.57% by nitrogen fertilization in the study, and this increase was statistically significant (P <0.01). The research supports our findings. On the phosphorus fertilization, although the increase in the crude protein ratio of the mixture was reported to be statistically insignificant, the crude protein ratio was 12.73% when phosphorus fertilizer was not applied and 13.42% in the case of P12.

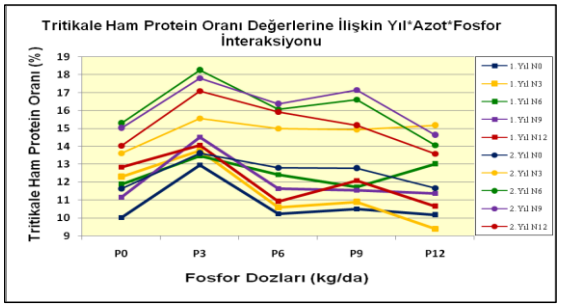

Figure 1.1 Year Related to Tritical Crude Protein Ratio Values * Nitrogen * Phosphorus Doses Interaction (%)

When Figure 4.7 is examined, it is observed that in the second year of the test, higher values are reached compared to the first year. In addition to the phosphorus doses of P6, P9 and P12, the said interactions were shown in the N6, N9 and N12 nitrogen dosing applications and the results were different according to years. For example, in the case of P9N6 application, higher values are obtained in the first year according to the application of P6N6, but these values are observed to decrease further in the second year. Similar situations apply to applications such as P9N12 and P12N12. As a result, the ratios of crude protein to tritical reacted differently depending on years and applied fertilizer doses, causing the interactions of Year * Nitrogen * Phosphorus doses.

1.2. Triticale K ratio (%)

Table 1.2. Mean Values and Groups of Tritical K (%) Values

	Uygulamalar	P_0	P_3	P_6	P_9	P_{12}	Ort.
1.Yıl	N_0	0.83	0.88	0.84	0.92	0.91	0.88
	N_3	0.79	0.90	0.86	0.95	0.85	0.87
	N_6	0.99	0.86	0.88	0.93	1.21	0.97
	N_9	0.95	0.92	0.87	1.04	0.65	0.89
	N_{12}	1.12	1.00	1.11	1.05	1.06	1.07
	Ort	0.94	0.91	0.91	0.98	0.94	0.93
2.Yıl	N_0	1.03	0.95	0.98	0.99	1.09	1.01
	N_3	1.00	1.18	1.08	0.92	1.02	1.04
	N_6	1.22	1.03	1.28	1.18	1.26	1.19
	N_9	1.11	1.31	1.11	1.19	1.22	1.19
	N_{12}	1.16	1.28	1.15	1.26	1.29	1.23
	Ort	1.10	1.15	1.12	1.11	1.18	1.13
2 Yıl Birleşik	N_0	0.93	0.92	0.91	0.96	1.00	0.94 b
	N_3	0.90	1.04	0.97	0.94	0.94	0.96 b
	N_6	1.11	0.95	1.08	1.06	1.24	1.08 ab
	N_9	1.03	1.12	0.99	1.12	0.94	1.04 ab
	N_{12}	1.14	1.14	1.13	1.16	1.18	1.15 a
	Ort.	1.02	1.03	1.02	1.04	1.06	1.03

The averages indicated by similar letters are not statistically different within the 5% error limits according to the F and LSD test.

The highest average triticale K ratio was 1.24% at the N6P12 plot, ie, at 6 kg / da nitrogen, while the lowest tritical K rate value of the study was N3P0 or 3 kg / da nitrogen fertilizer applied without phosphorus fertilization and 12 kg / da phosphorus fertilized plots. This value followed the N12P12 and N12P9 applications with 1.18 and 1.16%, respectively. According to the results of the F and LSD test, it was found that the K ratio values of the triticale in the N3P0 plots are statistically lower than the K values of the tritical K values in the 5 different nitrogen and phosphorus applied plots. These results are parallel to the findings of Karaca and Çimrin (2002).

1.3.Triticale Ca ratio (%)

Table 1.3. Mean Values and Groups of Triticale Ca (%) Values

	Uygulamalar	P_0	P_3	P_6	P_9	P_{12}	Ort.
1.Yıl	N_0	0.09	0.06	0.08	0.09	0.07	0.08
	N_3	0.08	0.05	0.12	0.12	0.07	0.09
	N_6	0.08	0.08	0.09	0.09	0.14	0.10
	N_9	0.07	0.06	0.06	0.12	0.09	0.08
	N_{12}	0.11	0.07	0.11	0.11	0.08	0.10
	Ort	0.09	0.06	0.09	0.11	0.09	0.09
2.Yıl	N_0	0.09	0.08	0.12	0.15	0.12	0.09
	N_3	0.09	0.09	0.15	0.13	0.14	0.09
	N_6	0.09	0.11	0.12	0.13	0.12	0.09
	N_9	0.11	0.09	0.15	0.12	0.10	0.09
	N_{12}	0.12	0.09	0.14	0.14	0.10	0.09
	Ort	0.10	0.09	0.14	0.13	0.12	0.09
2 Yıl Birleşik	N_0	0.09	0.07	0.10	0.12	0.10	0.08
	N_3	0.09	0.07	0.14	0.13	0.11	0.09
	N_6	0.09	0.10	0.11	0.11	0.13	0.09
	N_9	0.09	0.08	0.11	0.12	0.10	0.09
	N_{12}	0.12	0.08	0.13	0.13	0.09	0.09
	Ort.	0.09 cd	0.08 de	0.11 ab	0.12 a	0.10 bc	0.09

The averages indicated by similar letters are not statistically different within the 5% error limits according to the F and LSD test.

In Table 1.3, when the trial years, two year average values and groups of triticare Ca ratio are examined, it is observed that the Ca ratio to the average triticale varies between 0.05-0.14% in the first year and 0.08-0.15% in the second year due to nitrogen and phosphorus fertilization . The ratio of Ca to triticare ranged from 0.07 to 0.14% in the average of two years and the highest triticale Ca value was taken from the N3P6 plot. This value is N3P9, N6P12, N12P6, N12P9, while the lowest values are obtained from N0P3 and N3P3 parcels. Tan and Serin (1996) reported that when working with a mixture of 3 vetch + 1 barley, they found 1.18% of the calcium content of the herb and that this value decreased to 0.74% when the grain ratio of the mixture increased. In this regard, Tan and Serin (1996) support our work outcome.

1.4. Triticale Mg ratio (%)

Table 1.4. Mean Values and Groups of Triticale Mg (%) Values

	Uygulamalar	P_0	P_3	P_6	P_9	P_{12}	Ort.
1.Yıl	N_0	0.09	0.11	0.10	0.12	0.11	0.11
	N_3	0.12	0.10	0.10	0.10	0.09	0.10
	N_6	0.11	0.09	0.10	0.10	0.10	0.10
	N_9	0.09	0.10	0.10	0.09	0.10	0.10
	N_{12}	0.10	0.08	0.08	0.11	0.09	0.09
	Ort	0.10	0.10	0.10	0.10	0.10	0.10
2.Yıl	N_0	0.13	0.10	0.09	0.13	0.10	0.10
	N_3	0.16	0.12	0.09	0.12	0.12	0.10
	N_6	0.14	0.12	0.10	0.12	0.11	0.10
	N_9	0.17	0.12	0.09	0.11	0.10	0.10
	N_{12}	0.17	0.11	0.11	0.12	0.09	0.10
	Ort	0.15	0.11	0.10	0.12	0.10	0.10
2 Yıl Birleşik	N_0	0.11	0.11	0.10	0.13	0.11	0.10
	N_3	0.14	0.11	0.10	0.11	0.11	0.10
	N_6	0.13	0.11	0.10	0.11	0.11	0.10
	N_9	0.13	0.11	0.10	0.10	0.10	0.10
	N_{12}	0.14	0.10	0.10	0.12	0.09	0.09
	Ort.	0.13	0.11	0.10	0.11	0.10	0.10

The averages indicated by similar letters are not statistically different within the 5% error limits according to the F and LSD test.

The lowest mean triticale Mg ratio values were obtained from N12P12, 12 kg / da nitrogen and phosphorus fertilized plots, while the highest mean triticale Mg ratio values were obtained from the N3P0 and N12P0 plots with 0.14%. According to the results of the F and LSD tests, it was determined that the Mg content of triticare in N12P12 plots was lower than that of nitrogen and phosphorus applied tritics in the plots of 40% triticale and 60% vetch mixture and there was no statistically significant difference between plots.

1.5. Vetch Crude Protein Ratio (%)

Table 1.5. Mean Values and Groups of Crude Protein

	Uygulamalar	P_0	P_3	P_6	P_9	P_{12}	Ort.
1.Yıl	N_0	14.52	19.27	14.04	16.85	19.56	16.85
	N_3	17.77	21.13	19.59	17.36	20.98	19.37
	N_6	19.59	23.77	18.10	20.98	21.85	20.86
	N_9	19.72	25.70	18.52	23.31	24.08	22.27
	N_{12}	21.69	24.13	16.89	19.32	23.25	21.06
	Ort	18.66	22.80	17.43	19.56	21.94	20.08
2.Yıl	N_0	18.58	24.06	20.67	20.44	20.52	20.85
	N_3	21.58	25.15	23.98	23.88	24.35	23.79
	N_6	23.35	25.79	26.44	23.98	22.94	24.50
	N_9	22.29	28.81	26.19	22.17	25.52	25.00
	N_{12}	20.25	25.75	25.13	22.23	23.44	23.36
	Ort	21.21	25.91	24.48	22.54	23.35	23.50
2 Yıl Birleşik	N_0	16.55	21.67	17.36	18.65	20.04	18.85 b
	N_3	19.68	23.14	21.79	20.62	22.67	21.58 ab
	N_6	21.47	24.78	22.27	22.48	22.40	22.68 a
	N_9	21.01	27.26	22.36	22.74	24.80	23.63 a
	N_{12}	20.97	24.94	21.01	20.78	23.35	22.21 a
	Ort.	19.93	24.36	20.96	21.05	22.65	21.79

The averages indicated by similar letters are not statistically different within the 5% error limits according to the F and LSD test

The highest value was obtained from N9P3 parcels, ie 9 kg / da nitrogen and 3 kg / da phosphorus fertilization, while the lowest value of the lowest vetch crude protein ratio was taken from N0P0, that is to say without fertilizer applied. This value followed the N12P3 and N9P12 applications with 24.94% and 24.80, respectively. According to the results of the F and LSD tests, crude protein ratio values in the N0P0 control plot were found to be statistically significantly lower at 16.55% compared to the values of crude protein ratios in nitrogen and phosphorus fertilized plots at 40% respectively.

Panciera and Sparrow (1994) found that the ratio of protein to protein by nitrogen fertilization increased from 16.4% to 17.9%. Keatinge and Chapanian (1991) reported that, in some vetch species, when studying the effect of phosphorus on the chemical composition of soya bean, increased nitrogen content with increased phosphorus doses. In addition, Aydın and Tosun (1993) reported that nitrogen fertilization and crude vetch + barley mixture resulted in an increase in the crude protein ratio. The ratio of vinegar to vinegar of Aydın and Tosun (1996); 18.85% of the pure vetch, 80% of the triticale and 16.71% of the mixture were lower than the pure vetch cultivation. Yaktubay (1998) reported that crude protein yield of vetch + barley mixture ranged from 79.01-119.23 kg / da, and crude protein yield of vetch was high in early cultivation. Day; (2010) reported that the highest protein ratio (17.28%) was obtained from pure vetch, Tan (1991); and that the ratio of crude protein in grafts increased from 20.48% to 25.17%, while that of nitrogen fertilizers did not significantly affect the crude protein ratio.

1.6 Vetch K Ratio (%)

Table 1.6. Mean Values and Groups of Vetch K Ratio (%)

	Uygulamalar	P_0	P_3	P_6	P_9	P_{12}	Ort
1.Yıl	N_0	1.70	2.08	1.95	1.68	1.93	1.87
	N_3	1.82	1.96	2.12	1.70	2.07	1.93
	N_6	1.91	2.01	1.94	1.67	1.93	1.89
	N_9	1.94	2.00	2.10	1.86	2.05	1.99
	N_{12}	2.05	1.87	2.18	2.01	1.81	1.98
	Ort	1.88	1.98	2.06	1.78	1.96	1.93
2.Yıl	N_0	2.19	2.36	2.54	2.14	2.30	2.31
	N_3	2.24	2.54	2.38	2.39	2.56	2.42
	N_6	2.27	2.51	2.31	2.33	2.49	2.38
	N_9	2.33	2.34	2.39	2.38	2.51	2.39
	N_{12}	2.45	2.24	2.46	2.46	2.37	2.40
	Ort	2.30	2.40	2.42	2.34	2.45	2.38
2 Yıl Birleşik	N_0	1.95 cd	2.22 a-c	2.25 ab	1.91 d	2.12 a-d	2.09
	N_3	2.03 b-d	2.25 ab	2.25 ab	2.05 a-d	2.32 a	2.18
	N_6	2.09 a-d	2.26 ab	2.13 a-d	2.00 b-d	2.21 a-c	2.14
	N_9	2.14 a-d	2.17 a-d	2.25 ab	2.12 a-d	2.28 ab	2.19
	N_{12}	2.25 ab	2.06 a-d	2.32 a	2.24 ab	2.09 a-d	2.19
	Ort.	2.09	2.19	2.24	2.06	2.20	2.16

The averages indicated by similar letters are not statistically different within the 5% error limits according to the F and LSD test.

The vetch ratio values of the two years were ranged from 1.91 to 2.32% and the highest vetch ratio values were obtained from the N3P12 and N12P6 parcels, ie 3 and 12 kg / da nitrogen, at 12 and 6 kg / da phosphorus fertilization. The value of the lowest vet K rate was taken from the parcel N0P9 with 1.91%. Egorov and Egorova (1993), Karaca and Çimrin (2002); the results of their study showed that the potassium content of the mixture increased with nitrogen fertilization while the potassium content of the mixture was 1.645% on average when the nitrogen was not applied and the potassium content increased to 1.725% when 6 kg nitrogen was applied to the pot, indicating that this increase was statistically significant. Çomaklı and Taş (1996) reported that the potassium content of the Adi fi ve increased significantly with phosphorus fertilization in their study. (1997) reported that the content of potassium was 2.12% in the same way. Çomaklı and Taş (1996) suggest that vetch species can be roasted with 8 kg of P2O5 / da phosphorus to produce high quality coarse feeds. In our findings, 6 kg phosphorus doses would be sufficient.

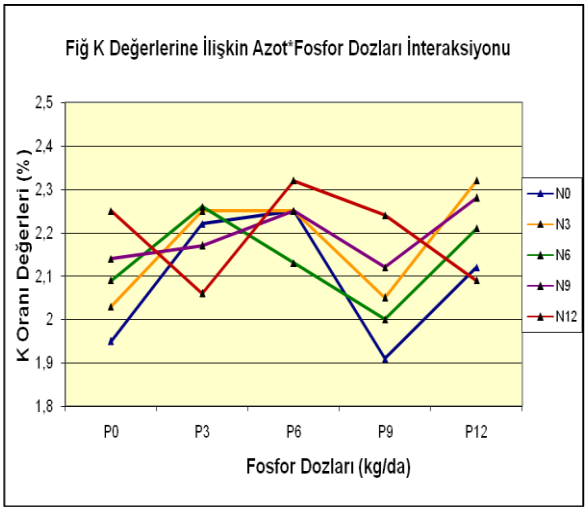

Figure 1.2. Nitrogen * Phosphorus Doses Interaction of Values (%)

When the Nitrogen * Phosphorus dosing interactions are given in Figure 4.8, vecth K values are shown to give different responses to increasing doses of Nitrogen in response to increasing phosphorus doses. 3 and 6 kg / da phosphorus and 0, 3 and 6 kg / da nitrogen doses of vetch K rate values of 9 kg / da phosphorus dose is observed to increase the vet K ratio. 9 kg / da phosphorus doses, 0, 3, 6, 9 and 12 kg / da nitrogen dosing practices decreased the ratio of vetch K is monitored. More specifically, K values in parasites treated with 3 and 6 kg / da phosphorus were increased in low nitrogen doses (0, 3 and 6 kg / da N), whereas in high nitrogen dosing applications (12 kg / da N) This has caused the formation of interactions. However, when the dose of phosphorus is increased, a decrease of up to 9 kg / da phosphorus is observed due to the increase in nitrogen doses. In contrast to other phosphorus doses, the vecth K ratio at 12 kg / da phosphorus supplementation has shown that there is no benefit for vecth K ratio of more than 9 kg / da phosphorus dose.

1.7. Vecth Ca ratio (%)

Table 1.7. Mean Values and Varying Groups of Vecth Ca (%) Values

	Uygulamalar	P_0	P_3	P_6	P_9	P_{12}	Ort.
1.Yıl	N_0	2.52	3.62	2.95	2.88	2.61	2.92
	N_3	2.85	3.44	2.70	2.54	2.71	2.85
	N_6	2.71	2.99	2.51	1.91	2.42	2.51
	N_9	2.93	2.73	2.70	2.39	2.79	2.71
	N_{12}	2.86	3.00	2.87	2.44	2.52	2.74
	Ort	2.77	3.16	2.75	2.43	2.61	2.74
2.Yıl	N_0	3.27	3.88	3.28	3.58	3.56	3.51
	N_3	3.19	3.80	3.53	3.51	3.43	3.49
	N_6	3.16	3.68	3.34	3.38	3.34	3.38
	N_9	3.23	3.48	3.56	3.26	3.45	3.40
	N_{12}	3.19	3.39	3.56	3.26	3.57	3.39
	Ort	3.21	3.65	3.45	3.40	3.47	3.44
2 Yıl Birleşik	N_0	2.90 c-e	3.75 a	3.12 c-e	3.23 b-d	3.09 c-e	3.22
	N_3	3.02 c-e	3.62 ab	3.12 c-e	3.03 c-e	3.07 c-e	3.17
	N_6	2.94 c-e	3.34 a-c	2.93 c-e	2.65 e	2.88 c-e	2.94
	N_9	3.08 c-e	3.11 c-e	3.13 c-e	2.83 de	3.12 c-e	3.05
	N_{12}	3.03 c-e	3.20 b-d	3.22 b-d	2.85 de	3.05 c-e	3.07
	Ort.	2.99	3.40	3.10	2.92	3.04	3.09

The averages indicated by similar letters are not statistically different within the 5% error limits according to the F and LSD test.

Among the characteristics examined, the lowest vetch Ca (%) value was taken from the N6P9 parcel, whereas the highest mean vet Ca ratio (%) value was; 3.75 with N0P3, that is, 3 kg / da phosphorus fertilizer. This value followed the N3P3 and N6P3 applications with insignificant differences and 3.62 and 3.34 respectively. Çomaklı and Taş (1996) reported that phosphorus fertilizer applied in increasing doses increased calcium content in Adi fi ve and the mean calcium content was 1.23%. (1997) reported that the same calcium content was 0.87% in the same manner as fertilization. It was found to be true in the results obtained. However, the high content of calcium in our study may be due to differences in species and varieties of plants used in combination with different climatic and environmental conditions.

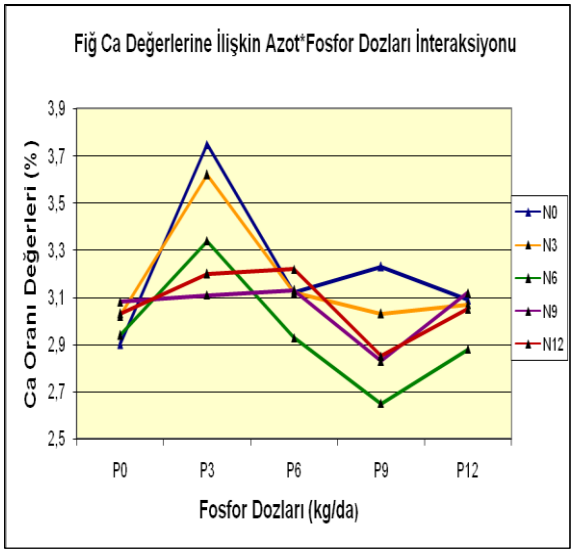

Figure 1.3. Nitrogen * Phosphorus Doses Interaction of Vecth Ca Values (%)

Figure 1.3, in which the Nitrogen Phosphorus doses interactions were given, showed that the values of Ca (%) values of the vecth Ca (%) values were different in response to the increase of the phosphorus doses, except for the dose of Phosphorus dose not applied at 9 kg / all Ca ratios were increased in all nitrogen doses, except for 9 and 12 kg / da nitrogen application in 3 and 6 kg / da phosphorus treatments. However, after 6 kg / da phosphorus dosing, nitrogen fertilizer applications at 6, 9 and 12 kg / da started to decrease in vecth Ca ratio (%) values and reappear after 9 kg / da phosphorus dose but not at 3 kg / da nitrogen dose.

1.8. Vetch Mg Ratio (%)

Table 1.8. Average Value of Vetch Mg (%) Values and Groups

	Uygulamalar	P_0	P_3	P_6	P_9	P_{12}	Ort.
1.Yıl	N_0	0.35	0.43	0.38	0.37	0.40	0.39
	N_3	0.38	0.41	0.37	0.36	0.46	0.40
	N_6	0.35	0.39	0.35	0.29	0.41	0.36
	N_9	0.37	0.36	0.39	0.33	0.46	0.38
	N_{12}	0.37	0.37	0.38	0.35	0.40	0.37
	Ort	0.36	0.39	0.37	0.34	0.43	0.38
2.Yıl	N_0	0.38	0.47	0.36	0.42	0.43	0.38
	N_3	0.38	0.46	0.37	0.38	0.45	0.37
	N_6	0.35	0.42	0.41	0.41	0.42	0.38
	N_9	0.38	0.38	0.39	0.35	0.44	0.38
	N_{12}	0.38	0.38	0.38	0.38	0.38	0.38
	Ort	0.37	0.42	0.38	0.39	0.42	0.38
2 Yıl Birleşik	N_0	0.37 d-f	0.45 ab	0.37 d-f	0.40 a-f	0.42 a-d	0.38
	N_3	0.38 c-f	0.44 a-c	0.37 d-f	0.37 d-f	0.46 a	0.39
	N_6	0.35 ef	0.41 a-e	0.38 c-f	0.35 ef	0.42 a-d	0.37
	N_9	0.38 c-f	0.37 d-f	0.39 b-f	0.34 f	0.45 ab	0.38
	N_{12}	0.38 c-f	0.38 c-f	0.38 c-f	0.37 d-f	0.39 b-f	0.38
	Ort.	0.37	0.41	0.38	0.36	0.43	0.38

The averages indicated by similar letters are not statistically different within the 5% error limits according to the F and LSD test.

The highest Mg (%) was obtained from N3P12 plots, ie 3 kg / da nitrogen and 12 kg / da phosphorus fertilization. The lowest vet Mg ratio (%) value was taken from the N9P9 parcels with 0.34%. Çomaklı and Taş (1996) reported that the content of magnesium increased significantly with phosphorus fertilization in the study they carried out. The content of magnesium was found to be 0.263% on average, Aydın et al. (1997) reported that the content of magnesium was 0.161-0.183%, and Mg content increased with nitrogen and phosphorus fertilizing. The results support our findings.

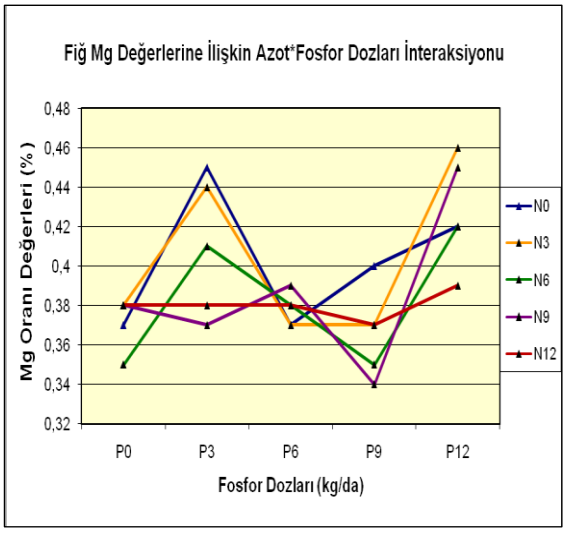

Figure 1.4. Nitrogen Related to vecth Mg Values * Phosphorus Doses Interaction (%)

When Figure 1.4 is examined, it is observed that the Nitrogen Phosphorus dose interactions for the vecth Mg ratio (%) values give different responses to the vecth Mg ratio values depending on the increasing nitrogen doses due to the increased phosphorus doses. (%) Values of nitrogen doses of 0, 3 and 6 kg / da phosphorus doses at 3 kg / da phosphorus doses and 0, 3, 6, 9 and 12 kg / da nitrogen doses at 12 kg / da phosphorus doses It is seen that the vag Mg ratio (%) values of 9 kg / da phosphorus application cause a decrease in all applied nitrogen doses. Tan and Serin (1996) found that cereals included in the study were found to alter the mineral composition of the grains, in particular the decrease in Ca, Mg and P and the increase in tetany (K: Ca + Mg) ratio, and 75% vetch and 25% cereal mix.

CONCLUSION And RECOMMENDATIONS

In order to obtain the highest yield and quality of feed with the amount of mixture and fertilizer suitable for the region, the nitrogen and phosphorus fertilizer doses applied to 60% vetch and 40% triticale mixture, triticale and vet plant height, The effect on the vetch green yields, hay yield, aged triticale and vetch rates, triticale and vetch crude rates, K (%) ratios, Ca (%) ratios and vet Mg (%) ratios were statistically significant. The effect of fertilizer doses on Mg (%) ratio to triticale with dry triticale and vetch ratios is statistically insignificant. It was determined that the nitrogen doses applied to the plants involved in the mixing increased to 9 kg / da and the phosphor doses increased to 6 kg / da and the highest yield was obtained from the N9P6 plot at 2947.5 kg / da. The highest value for the ratio of crude protein to triticale was obtained from the plot of N9P3 at 16.16% for the average of the two years while the lowest value for the crude protein was taken from the N0P0 parcel with 10.84%. In the vetch plant, the highest crude protein ratio was obtained from the N9P3 parcels with 27.26%, while the lowest rate was obtained from the parcels of N0P0 with 16.55%. According to the results of the research, the most suitable combination of fertilizer is 9 kg / da nitrogen (N) and 6 kg / da nitrogen (N), provided that at least 10 kg / ha of phosphorus is found in the mixed cultivation system to be made with the varieties of Tacettinbey tritikale with 60% kg / da phosphorus (P). It is considered that the total amount of phosphorus to be applied and half of the amount of nitrogen should be given together with planting, while the other half of nitrogen is given in the early seedling stage of the plant after the emergence.

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