Scientific Papers. Series A. Agronomy, Vol. LVI, 2013
ISSN 2285-5785; ISSN CD-ROM 2285-5793; ISSN Online 2285-5807; ISSN-L 2285-5785

RESEARCH ON APPLICATION OF NPK FERTILIZERS IN PEANUTS GROWN ON SANDY SOILS

Milica DIMA, Mihaela CROITORU, Reta DRĂGHICI

Research-Development Center for Field Crops on Sandy Soils, 130, Victoria Street, 207220, Dabuleni, Dolj County, Romania

Corresponding author email: milicadima@yahoo.com

Abstract

Sandy soils by texture provides good conditions for bringing peanuts, so there is the possibility of their cultivation on these lands.
A rational fertilization, besides covering the necessary nutrients for plants involves ensuring at the same time maintaining a certain proportion between soil nutrients.
One of the ways in which it can act to reduce nitrogen loss through leaching is split application of nitrogen on two occasions.
Nitrogen fertilizers affect productivity elements and foundations achieve increased production of pods.
Applying nitrogen fertilizer dose of N90 on two occasions, the first at sowing, the second in vegetation led to obtaining a very significant increase of production 1321 kg/ha.

Key words: *fertilization, peanut, sandy soils.*

INTRODUCTION

For ecopedological sands and sandy soil conditions allow cultivation of a wide range of plant species including peanuts.
Sandy soils by texture provides good conditions for bringing peanuts, so there is the possibility of their cultivation on these lands.
Global results show that fertilization contributes about 40% to increase yields per unit area and yields obtained in different countries are linked to the quantities of fertilizers (Hera et al., 1984; Hera et al., 1980).
A rational fertilization, besides covering the necessary nutrients for plants involves ensuring at the same time maintaining a certain proportion between soil nutrients (Caramete et al., 1973).
Macro and microelements effect on plants is very complex and dependent on the absolute amount and the ratio between them.
In case of dry periods is recommended fertilizer in small doses, but in a balanced ratio of NPK and traces of micronutrients.

MATERIALS AND METHODS

The research was conducted under irrigation, the three-year rotation of wheat-corn-peanut.
The experiment was located in the field, by the method of randomized blocks including 13 variants was applied nitrogen dose divided into three rounds: full dose at sowing, 1/3 at planting + 2/3 vegetation, vegetation full dose.
Observed in experience growing technology peanuts on sandy soils under irrigation.
Vegetation biometric measurements were made on waist plant, number of tillers per plant, and the harvest were determined number of pods per plant, number of grains per pod, pod production.
Laboratory to determine grain protein content based on nitrogen dose applied.
Peanut production was brought to the humidity of 9%.
Interpretation of research results was performed by analysis of variance method and correlation method.

RESULTS AND DISCUSSIONS

It is known that nitrogen peanuts secures the most about symbiotic. But symbiotic nitrogen not fully meet the needs of plants, requiring supply of nitrogen through fertilizers (Pop et al., 1986).
Results of Dima (2006), under the experimental culture peanut Dabuleni CCDCPN

demonstrates the need for nitrogen fertilizers, which have had a significant influence by applying the first phase of vegetation, size and elements influencing productivity, leading to achieving increased production of pods.

Biometric determinations made discloses a class of plants that can reach up to 47 cm in the variant fertilized with dose $N_{90}P_{60}K_{60}$ where nitrogen was divided doses (1/3 at sowing +2/3 vegetation). Compared to the control unfertilized the plant size was 30.2 cm was recorded size of 46 cm in the variant fertilized with $N_{60}P_{60}K_{60}$ the full dose was administered in vegetation nitrogen. In the first part of the growing season peanut plants have slow growth, followed by a period of rapid growth both in height and weight, which continues almost to harvest.

Table 1. Influence of nitrogen management on determinations made during the growing season (2011-2012)

Experimental variant		Plant height (cm)	Number of stems/plant	Number of pods/plant	Number of grains/pod
NPK	The time of application of nitrogen				
N0P0K0		30.2	4	20.6	1.8
N0P60K0		31.4	5	23	2
N0P0K60		32	5	21.6	2
N0P60K60		37	5	21.4	2
N30P60K60	at sowing	36.8	5	22.4	2.1
	1/3 at sowing+2/3 in vegetation	37	5	23	2
	In vegetation	37.8	5	21.2	2.2
N60P60K60	at sowing	39.8	5	25.6	2
	1/3 at sowing+2/3 in vegetation	36.6	5	28	2.2
	In vegetation	46	5	24.2	2
N90P60K60	at sowing	34.6	4	32.4	2.3
	1/3 at sowing+2/3 in vegetation	47	5	33.2	2.8
	In vegetation	38.8	5	28.6	2.6

Observations on productivity elements show that production increased more or less in all areas that received nitrogen.

In terms of productivity, represented by the number of mature pods formed per plant was observed with the highest production of 2359 kg of pods/ha variant in which the dose of $N_{90}P_{60}K_{60}$ where nitrogen was split 1/3 at sowing + 2/3 in vegetation resulting in a production increase very significantly.

Table 2. Influence of nitrogen management on groundnut production and protein content of grain

Experimental variant		Production		Difference		The protein content of grain
NPK	The time of application of nitrogen	Kg/ha	%	Kg/ha	Significance	%
N0P0K0		1038	100	Mt.	Mt.	21.3
N0P60K0		1190	114.6	152	-	21.7
N0P0K60		1211	116.6	173	-	22.1
N0P60K60		1212	116.7	174		22.7
N30P60K60	At sowing	1579	152.1	541	-	22.2
	1/3 at sowing+2/3 in vegetation	1817	175	779	*	23.2
	In vegetation	2034	195.9	996	**	22.9
N60P60K60	At sowing	1969	189.6	931	*	23.2
	1/3 at sowing+2/3 in vegetation	2099	202.2	1061	**	23.9
	In vegetation	1882	181.3	844	*	23.2
N90P60K60	At sowing	2185	210.5	1147	**	21.8
	1/3 at sowing+2/3 in vegetation	2359	227.2	1321	***	23.8
	In vegetation	2250	216.7	1212	**	22.6

Also increase production significantly distinct variant was obtained when nitrogen was applied at a dose of N_{90} kg/ha vegetation. production obtained in this way is of 2250 kg/ha.

Apply nitrogen after flowering is uneconomic and prolongs vegetation cluster.

The chemical composition of peanut seeds are characterized by a content of 20-30% protein and 45-60% fat (Rehm and Espig, 1976).

Results on peanut production quality culture, shows a protein content ranging from 21.3% in the control variant unfertilized and 23.9% in the variant fertilized with $N_{60}P_{60}K_{60}$ and nitrogen was given 1/3 at sowing + 2/3 in vegetation. If we compare the amount of protein in grain production from, it increases with increasing production (Figure 1).

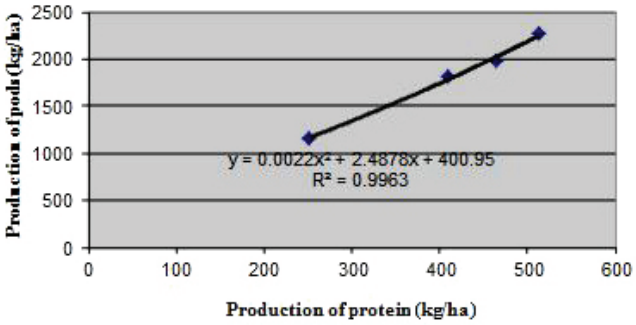

Figure 1. Correlation between the pods yield and the quantity of protein depending on the dos eof nitrogen applied

CONCLUSIONS

One of the ways in which it can act to reduce nitrogen loss through leaching is split application of nitrogen on two occasions.

Nitrogen fertilizers affect productivity elements and foundations achieve increased production of pods.

Applying nitrogen fertilizer dose of N_{90} on two occasions, the first at sowing, the second in vegetation led to obtaining a very significant increase of production 1321 kg/ha.

REFERENCES

Caramete et al., 1973. Plant Nutrition and fertilizer application. Ceres Publishing House, Bucharest.

Dima M., 2006. Performance of peanut varieties and lines in different technological conditions on irrigated psamosoils in southern Oltenia. Thesis, Craiova.

Hera C., Borlan Z., 1980. Guide to composition fertilization plans. Ceres Publishing House, Bucharest.

Hera C., Eliade Gh, Ghinea L., Popescu A., 1984. Provide nitrogen for crops. Ceres Publishing House, Bucharest.

Pop L. et al., 1986. Culture of ground nuts (peanuts). Ceres Publishing House, Bucharest.

Rehm S., Espig G., 1976. Die Kulturpflanzen der Tropen und Subtropen. Verlag Eugen Ulmer, Sttutgart.