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Response of Peanut due to Application of Dolomite Plus

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ABSTRACT

Most developing areal for peanut crop (*Arachis hoypogeae*) is upland, that is dominated by parent soil and has acid characteristis. Main constraints for this soil are pH and low soil productivity. Dolomite plus is a dolomite ameliorant, with phosphate nutrient. The dolomite plus beside as the ameliorant and a source of magnecium and calcium nutrients, also as a source of phosphate nutrient. The objective of the research was to study effectivity of dolomite plus on peanut growth in Inceptisols soil. This research was conducted in the greenhouse using a randomize completely designed with 8 treatments and 5 replications. The treatments were control, NPK, and combinations of NPK with six dolomite plus levels. Relative Agronomic Effectiveness (RAE) analyses was used determine to the effectivity of dolomite plus. The result showed that application of dolomite plus 1,600 kg ha^{-1} with NPK fertilizer increased dry weight of grain yield untill 27% (11.53 to 14.65 g plant^{-1}) compared to NPK fertilizer application alone, that was showed by RAE > 100% or among 171-251%. Application of dolomite plus with NPK increased soil pH, soil available P (Bray 1), Ca and Mg exchangeable, and CEC as 1.9 unit; 6.2 mg kg^{-1}; 15.87 cmol(+) kg^{-1}; 14.27 cmol(+) kg^{-1}; and 17.29 cmol(+) kg^{-1} respectively. Maximum rate of dolomite plus was 2,500 kg ha^{-1} with the yield was 14.2 g plant^{-1} grain dry weight. The rate of dolomite plus that was higher than 2,500 kg ha^{-1} could decrease the yield.

Keywords: Acid soils, dolomite plus, peanut crop, Inceptisols, RAE

INTRODUCTION

Peanut (*Arachis hypogeae*) is one of main food crop, beside maize and rice. The data shows about 60% of peanut in Indonesia is used as a raw material for food industry and about 57% of them for animal feed (Anonymous 2006). That is a challenge and an opportunity to develope peanut production in dome area. A largely agricultural area of peanut is at dryland (79%). From this dry land area of peanut, 57% of them are growed at the soil that is classified as old weathering soil such as Ultsols, Oxisols, and Inceptisols. These soils generally have charactiristics of acid to very acid and poor of nutrients. Therefore, the soil acidity and fertility can become an important problem to increase the peanut productivity. High soil acidity can be considered as an important factor, which adversely affect crop production. Hence, the correction of soil acidity will be an important consideration to improve the crop growth in acid soils. Therefore, the use of lime materials to reduce the soil acidity is an important soil management practice (Wijewardena 2001).

The agricultural limes *i.e.* dolomite, calcite, and phosphate lime are natural soil conditioner that are derived from lime rocks. Dolomite ($CaMg(CO_3)_2$) is an agricultural lime that contains Ca and Mg nutrients. Calcite ($CaCO_3$) is also an agricultural lime but it only contain Ca nutrient. Dolomite is a type of compact limestone consisting of a calcium carbonate (contain 22% calcium) and magnecium carbonate (contain 12% Mg). Phosphate lime is calcite rocks which beside contains Ca nutrients, also contain P nutrient (P_2O_5 > 5%) (Suriadikarta *et al*. 2004; Chutichudet *et al.* 2010; Saliu and shehu 2012). In agriculture, dolomite is commonly used as a soil fertilizer in a range of soils (Chutichudet *et al.* 2010)

Agricultural lime is a material commonly used to improve pH at acid soil. Beside fertilizer, liming is essential for increasing soil fertility and productivity in acid soil. The research during 4 years on Kuamang Kuning Unit IV Jambi Province showed that application lime and N, P, and K fertilizers with high dosages during four years increased peanut yield higher than the without application of fertilizer or application of fertilizer with low rates. Nevertheless, application high rates of fertilizer and lime were unable to maintain soil productivity for along time, where the crop yield were likely to decline from year to year (Santoso and Sofyan, 2002). Dierolf *et al.* (2001) reported that calcite or dolomite lime could reduce Al toxicity untill five years if the lime was applied in large quantities (> 3 Mg ha^{-1}). The applicaton of phosphate rocks 1 ton ha^{-1} had less influence to increase pH than lime. Cresswell and Weir *in* Chutichudet *et al.* (2010) reported that application of calcium in the form of dolomite, which was a calcium-releasing compound, could be used to increase calcium in the pooting mix. Then Kovacevic and Rastija (2010) and Ritchey *et al.* (2004), application of ameliorant in the acid soils by different liming materials can be used to neutralize soil acidity, but majority of them come from ground lmestone such as calcite ($CaCO_3$) and dolomite ($CaCO_3$, $MgCO_3$) .

Dolomite plus can be classified as dolomite formula based on SNI 02-2804-1992. Dolomite plus contains 30.52% CaO and 17.11% MgO, and 1.35% P_2O_5 nutrients. The content of heavy metals *i.e.* Pb, Cd, As, and Hg were low as 2.6 mg kg^{-1}, 0.7 mg kg^{-1}, and not measurable, respectively. Application of Dolomite plus is aimed to increase the peanut yield and rendement's. Calsium, magnesium, and phosphate nutrients in dolomite are very important for formation of leave chlorophyl, root growth, and pod filling of peanut. However, the effectiveness of dolomite plus to soil and crop producivity is not known yet. Therefore, before dolomite plus is used widely by farmers, it is necessary to determine its efectiveness to soil and crop productivity.

The aim of this research was to study the effectiveness of dolomite plus for peanut at Inceptisols.

MATERIALS AND METHODS

Study site

This research was conducted in the Greenhouse of Soil Research Institute using Inceptisols soil from Cicadas Village, Ciampea, Bogor District and the Research and Soil Testing Laboratory.

Research Design

This research used a completely randomized design (CRD) with five replications and eight treatments which were consisted of: control, NPK, and combination NPK with six levels of dolomite. As the base line, the treatments illustrated at Table 1.

Dolomite plus was applied 7 days before planting by stirring evently in the soil, with the levels in accordance to the treatments. The recommendation rate for dolomite plus was 200 kg ha^{-1}. As standard fertilizer, it was used NPK as a single fertilizer derived from Urea, SP-36, and KCl with the rates were 50 kg ha^{-1} urea, 200 kg ha^{-1} SP-36, and 150 kg ha^{-1} KCl.

Observation of peanut plant heights were conducted each week untill flowering phase, *i.e.* at plant age 14, 21, and 28 days after planting (DAP). The plants were harvested at 100 DAP and then were observed its wet and dry weight, amount of empty and filling pod, weight of empty and filling pod, and dry seed weight. Observation of soil chemical characteristics were conducted at beginning of research and after harvesting. Parameters of chemical characteristics that were obeserved *i.e.* pH, available P (Bray 1 extractant), K_{exc}, Ca_{ech} Mg_{ech} and CEC.

Table 1. The treatment and fertilizer rates in the effect of dolomite plus for peanut plant in the green house experiment using Inceptisols.

No.	Treatment	Urea	SP-36	KCl	Dolomite plus	Animal manure
		……………………….. kg ha^{-1}			……………………..	
T1	Control	0	0	0	0	0
T2	NPK	50	200	150	0	0
T3	NPK + dolomite plus1	50	200	150	100	0
T4	NPK + dolomite plus2	50	200	150	200	0
T5	NPK + dolomite plus3	50	200	150	800	0
T6.	NPK + dolomite plus4	50	200	150	1.600	0
T7	NPK + dolomite plus5	50	200	150	3.200	0
T8	NPK + dolomite plus2 + animal manure	50	200	150	200	2.000

Statistical Analysis

Effect of the treatments were evaluated, by Anova and the difference between the treatments were tested by Duncan New Multiple Range Test (DMRT) at 5% level differences.

Fertilizer effectivity was accounted by using relative agronomic effectiveness (RAE). RAE is comparison between the increasing yield caused by fertilizer applications that were tested and the increasing yield by standard fertilizer application in percent (Macha *et al.* 1984).

$$RAE = \frac{\text{Yield at fertilizer that was tested} - \text{the yield at the control}}{\text{Yield at standard fertilizer} - \text{the yield at the control}} \times 100\%$$

RESULTS AND DISCUSSION

Dolomite Plus Analysis

The results of dolomite plus application are presented at Table 2. It is shown that CaO and MgO contents were high *i.e.*: 30.76 and 18.18%, respectively with Fe_2O_3 and Al_2O_3 is low *i.e.* 0.12 and 0.18%. The heavy metal contents Pb, Cd, As, and Hg were very low *i.e.* 2.6 mg kg^{-1}, 0.7 mg kg^{-1}, and not measureable respectively. This result shows that dolomite plus that was qualified as dolomite formula based on SNI 02-2804-1992. Dolomite plus contains 1.36% P_2O_5 that is low.

Soil Characteristics before Experiment

This experiment used Inceptisols soil that had clay texture, soil acidity (pH) was acid. C-organic and total nitrogen were low with medium C-N ratio. Potential P (HCl 25% extractant) was high with available P (Bray 1 extractant) was very low. Potential K (HCl 25% extractan) and exchangeable K were low and CEC was low (Table 3).

Inceptisols Cicadas is soil that have low soil fertility, because contained N, P, and K macro nutrient

Table 3. Texture and soil chemical characteristics of Inceptisols Cicadas before experiment.

Parameter observation	Results	Criteria
Texture		
- sand	10.00	Clay
- dust	24.00	
- clay	66.00	
pH (H_2O)	4.30	Acid
pH (KCl)	3.70	
Organic-C (%)	1.25	Low
Organic-N (%)	0.10	Svery low
Ratio C/N	12.00	Medium
P-HCl 25% (mg kg^{-1})	55.80	High
K-HCl 25% (mg kg^{-1})	5.50	Very low
P-Bray I (mg kg^{-1})	4.00	Very low
Cation Echangeable Value		
- Ca_{dd} (cmol(+) kg^{-1})	2.35	Low
- Mg_{dd} (cmol(+) kg^{-1})	0.90	Low
- K_{exc} (cmol(+) kg^{-1})	0.07	Very low
- $Na_{exc.}$ (cmol(+) kg^{-1})	0.25	Low
CEC (mol kg^{-1})	12.29	Low
Base saturation (%)	29.00	Low
Al^{3+} (cmol(+) kg^{-1})	2.89	Medium
H^+ (cmol(+) kg^{-1})	0.85	Low
Al saturation (%)	39.50	High

Table 2. The quality of dolomite plus.

No.	The kind of analysis	Unit	The result	SNI 02-2804-1992
1.	Water content	%	4.31	Maximum 5
2.	Fineness			
	- Fit Sieve Mesh No. 25	%	100	100
	- Fit Sieve Mesh No. 80	%	80	50
3.	Oxide total content			
	- CaO	%	30.76	Minimum 30
	- MgO	%	18.15	Minimum18
	- Fe_2O_3	%	0.12	Maximum 3
	- Al_2O_3	%	0.18	Maximum 3
4.	P_2O_5 content	%	1.36	
5.	Heavy metal content			
	- Pb	mg kg^{-1}	2.60	
	- Cd	mg kg^{-1}	0.70	
	- As	mg kg^{-}	not determinant	
	- Hg	mg kg^{-1}	< 0.01	
	- $CaCO_3$ equivalent	%	103.02	Minimum 8

available were low and had low pH. Furthemore, Ca and Mg content and % base saturation was low too, so that utilizaton of this soil beside need macro nutrient input (N, P, and K), also addition of Ca and Mg nutrient. Dolomite as source of Ca and Mg, beside can incease pH, and base saturation, also affected to formation of peanut plant ginofor.

Effect of Dolomite Plus on Soil Chemical Characteristics

Dolomite plus application increased pH H_2O untill 1,9 unit from 4.3-6.2 (Table 4). This is in accordance with research of Ibrahim and Kasno (2008) that soil pH with lime application was higher than without lime. The same thing was also presented by Blevins *et al.* (1978); Suksri (1998); Wijewardena (2001); Kovacevic and Rastija (2010); Hicklenton and Cairns (1992) and Ermadani (2010), soil pH increased linearly due to liming.

Sulistiyanto *et al.* (2007) *in* Ibrahim and Kasno (2008) presented that soil pH increased from 4.3 to 4.5 along with increasing of lime rates application. Heylar and Anderson (1974) reported that dolomite application increased soluble soil pH from 3.95 to 4.93 at without plant treatment and 4.08 to 3.91 with plant treatment. Wijewardena (2001) reported that the increasing of soil pH would have been an important factor for improving crop yield.

There are very significantly correlation between dolomite plus rates and soil pH after harvesting (Figure 1). The more excessive dolomite plus rates were applied to the soil, the more bases (Ca, Mg) were added to soil, furthermore they would substitute Al.

NPK and dolomite plus aplication up to 1,600 kg ha^{-1} increased available P_2O_5 content from 32.62 to 39.52 mg kg^{-1} and it the applications were higher than this rate, the available P_2O_5 content decreased to be 35.71 mg kg^{-1}. Increasing available P_2O_5

Table 4. Effect of dolomite plus on soil pH P_2O_5, $Ca_{exc.}$, $Mg_{exc.}$, and CEC after harvesting.

No.	Treatments	pH H_2O	P_2O_5 mg kg^{-1}	Ca_{dd}	Mg_{dd}	K	CEC
				........................cmol(+) kg^{-1}.......................			
	Before	4.3	4.00	2.35	0.90	0.07	12.29
T1.	Control	4.3	1.96	2.08	0.86	0.02	9.06
T2.	NPK	4.4	32.39	1.67	0.81	0.09	9.15
T3.	NPK + dolomite1	4.5	32.62	1.80	1.20	0.09	10.20
T4.	NPK + dolomite2	4.5	33.20	3.86	2.55	0.09	11.56
T5.	NPK + dolomite3	5.0	34.98	4.30	5.50	0.05	12.00
T6.	NPK + dolomite4	5.5	39.52	8.05	7.00	0.03	15.00
T7.	NPK + dolomite5	6.2	37.51	17.54	15.08	0.04	26.44
T8.	NPK + dolomite2 + animal manure	5.6	33.08	2.55	1.72	0.05	15.17

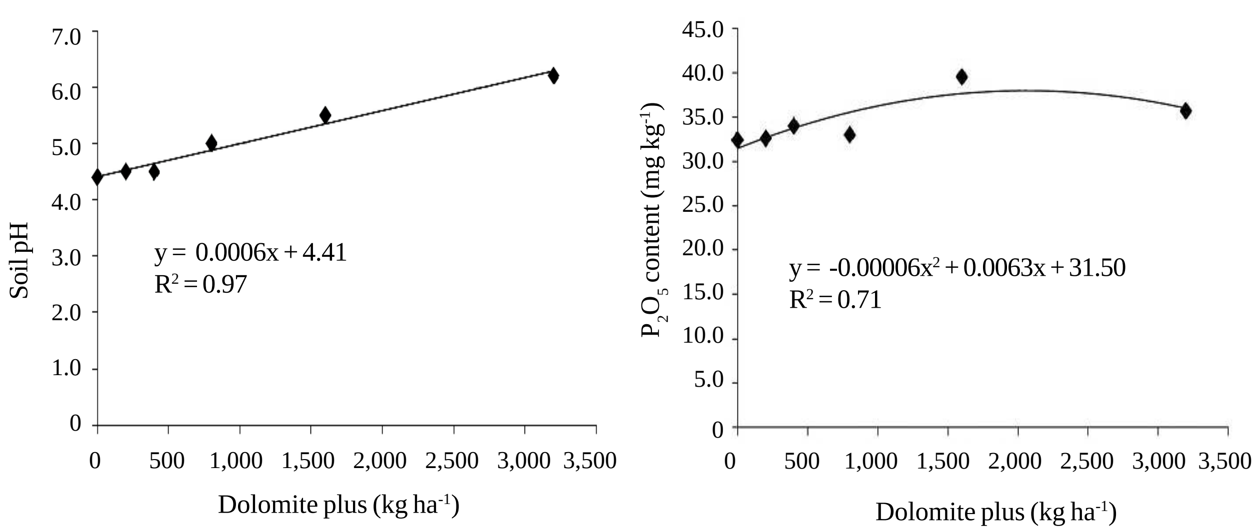

Figure 1. Correlation between dolomite plus rates with soil pH and P_2O_5 content of Inceptisols soil in the greenhouse experiment

content by dolomite plus untill 1,600 kg ha^{-1}, beside due to the addition of P nutrient from SP-36 fertilizer and dolomite plus, was also due to the increasing of soil pH.

Decreasing soil P_2O_5 at the treatment of dolomite plus with rates 3,200 kg ha^{-1} showed that there has been over liming, that caused P in soil solution was bound to be Ca-P, so that it was not available for plant. Table 2 and Figure 2 showed that there has been increasing of Ca content in soil solution as 117% from dolomite plus 1,600 kg ha^{-1} treatment. Decreasing of available P content by over liming was also presented by Heylar and Anderson (1974) that P concentration in soil solution decreased by linear in accordance to increasing of soil pH because of $CaCO_3$ application.

Dolomite plus application increased cations content in soil after the experiment. Soil $Ca_{exc.}$, $Mg_{exc.}$, and CEC increased as 15.87 cmol(+) kg^{-1}, 14.27 cmol(+) kg^{-1}, and 17.29 cmol(+) kg^{-1} respectivelly (Table 4). Figure 2 showed that there were significantly correlation between dolomite plus application with soil Ca and Mg. Increasing of dolomite plus rates also increased $Ca_{exc.}$ and $Mg_{exc.}$ Content in soil solution.

Increasing of $Ca_{exc.}$, $Mg_{exc.}$, and CEC contents were caused by increasing of soil pH, that would decrease exchangeable aluminium and mangan. Aluminium and mangan will be replaced by Ca, Mg, Na, and K cations in adsorpsion complexs, so that soil CEC will increase (Richey *et al*. 2004). Trakal *et al*. (2011) reported that CEC of liming variant increased significantly in comparison with control, due to a well known fact, that limestone application increased the cation retention capacity of soil.

Just the opposite condition was shown by soil K content after experiment. Soil K content was likely to decrease by increasing of dolomite plus rates. There is a relation with characteristif of K nutrient which is mobile, so that it will be easily loss from soil solution, as well as the characteristic of K nutrient as a luxurous nutrient i.e. more and more K nutrient in the soil so that more and more K nutrien was adsorbed by the plant.

Effect of Dolomite Plus on the Growth of Peanut

Effects of dolomite plus on peanut plant height at 14 DAP, 21 DAP, and 28 DAP are presented at Table 5. Application of dolomite plus had no significant effect to plant height at 14 DAP, but therewere significant effects at 21 and 28 DAT.

At 21 DAP, application 1,600 kg ha^{-1} dolomite plus significantly increased plant height compared to controll but no significant effect compared to NPK fertilzer treatment. Dolomite plus 1,600 kg ha^{-1} increased plant height as 16.5% than control.

Increasing of dolomite plus rates from 200 to 3,200 kg ha^{-1} did not have significant effect to plant height. However, plant heigh was likely to increase with increasing rates. Plant height increased from 19.64 cm to 21.62 cm with increasing dolomite plus rates from 200 to 3,200 kg ha^{-1}.

At 28 DAP, application 3,200 kg ha^{-1} dolomite plus significantly affected plant height compared to control and NPK treatment. Application of 3,200 kg ha^{-1} dolomite plus had significant different plant height as 26.10 cm and increased plant height 34.4% compared to control and 20,17% compared to NPK treatment.

Increasing of dolomite plus rates to be 3,200 kg ha^{-1} at 28 DAP had a significant effect to plant height compared to 200 kg ha^{-1} and 1,600 kg ha^{-1}

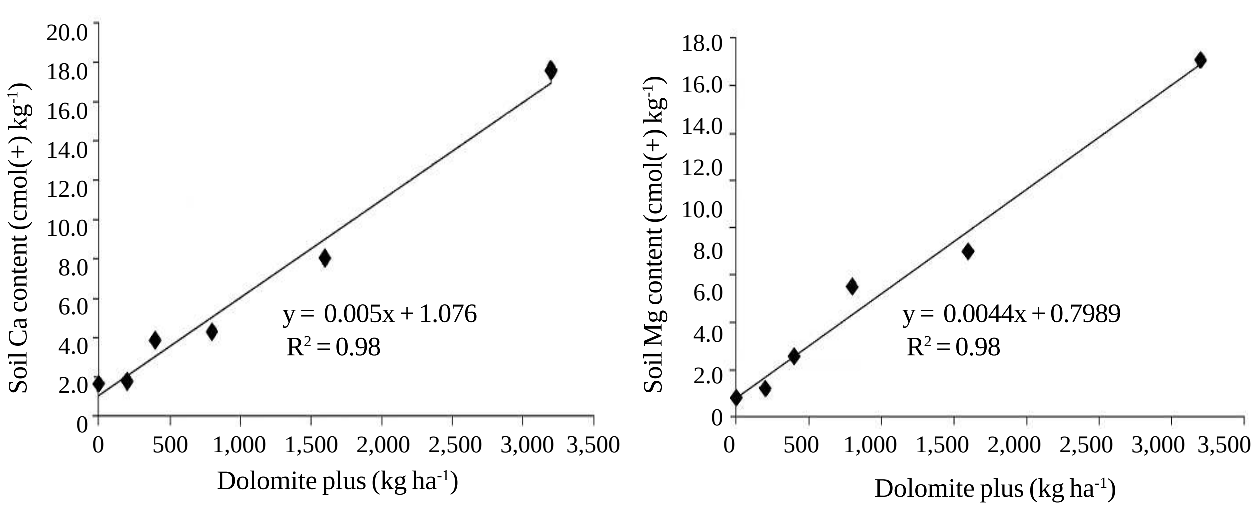

Figure 2. Correlation between dolomite plus rates with $Ca_{exc.}$ and $Mg_{exc.}$ of Inceptisols soil in the green-house experiment.

Table 5. Effect of dolomite plus on peanut plant height at 14, 21, and 28 DAP on Inceptisols soil in the greenhouse experiment.

No.	Treatments	Plant height (cm)		
		14 DAP	DAP	28 DAP
T1.	Control	16.54 a	18.56 b	19.40 c
T2.	NPK	17.94 a	20.86 ab	21.72 bc
T3.	NPK + dolomite1	17.24 a	19.64 ab	20.56 bc
T4.	NPK + dolomite2	18.32 a	19.80 ab	20.86 bc
T5.	NPK + dolomite3	17.42 a	19.66 ab	21.34 bc
T6.	NPK + dolomite4	18.80 a	21.54 a	22.86 b
T7.	NPK + dolomite5	18.60 a	21.62 a	26.10 a
T8.	NPK + dolomite2 + animal manure	18.20 a	21.24 a	26.06 a

Note: Numbers in the same column that are followed by the same letter are not siginificantly different at 0.05 DMRT.

dolomite plus. Rates of dolomite plus 200-800 kg ha^{-1} did not significantly different. It can be concluded that the best dolomite plus rate for increasing plant height was 1,600 kg ha^{-1}.

In general, the acid soil like Ultisols and Inceptisols are low in plant nutrients content. Hence, the crops grown in acid soil show response to the application of N, P, K, Mg, S and micronutrients (Wijewardena 2001).

Effect of Dolomite Plus on Yield of Peanut and RAE

Effect of dolomite plus on the peanut yield components (% filling pod, amount of pod, dry weigh of emphty and filling pod) are presented at Table 6. Dolomite plus treatment significantly affected the peanut yield components compared to control and NPK fertilzer treatment. Dolomite plus 1,600 kg ha^{-1} + NPK (50 kg urea, 200 kg SP-36, dan 150 kg KCl per ha) significantly increased total pod compared to control, but no significant effect compared to NPK treatment (50 kg urea, 200 kg SP-36, dan 150 kg KCl per ha). Dolomite plus rate 1,600 kg ha^{-1} (8 × recommendation rates) + NPK treatment decreased total empty pod untill 10% compared to NPK treatment. It was shown that application of dolomite plus combined with NPK fertilizer increased total pod but decreased percent of empty pod, so that total of filled pod increased too.

Increasing of total filled pod would increase weigth of filled pod. It was shown at application of 1,600 kg ha^{-1} + NPK treatment. This combination treatment had significant different compared to control and NPK fertilizer treatment. Weight of filled pod at application of 1,600 kg ha^{-1} + NPK treatment increased 39%, compared to NPK treatment.

As weigh of filled pod, 1,600 kg ha^{-1} dolomite plus+NPK (T6) also had significant different on dry weigh peanut seed, if compare to control (T1) and NPK fertilizer treatment (T2) (Table 7). Application of 1,600 kg ha^{-1}+NPK treatment (T6) increased dry

Table 6. Effect application of dolomite plus on the precentage filled pod and empty dry weigh and filled pod of peanut on Inceptisols soil in the greenhouse experiment.

No.	Treatments	Amount of pod		Dry weight pod	
		Filled	Total	Empty	Filled
		(%)	(pieces)	………. g plant^{-1}	……….
T1.	Control	35 ab	15.4 a	0.64 b	13.51 a
T2.	NPK	45 a	20.4 ab	1.20 ab	15.45 ab
T3.	NPK + dolomite1	56 b	20.2 ab	1.17 ab	14.83 ab
T4.	NPK + dolomite2	54 ab	20.2 ab	0.99 ab	16.36 bc
T5.	NPK + dolomite3	57 b	23.0 ab	1.06 ab	15.90 ab
T6.	NPK + dolomite4	55 ab	25.4 b	1.17 ab	21.51 d
T7.	NPK + dolomite5	54 ab	22.8 ab	1.12 ab	16.96 bc
T8.	NPK + dolomite2 + animal manure	54 ab	23.8 b	1.17 ab	18.63 cd

Note: Numbers in the same column that are followed by the same letter are not siginificantly different at 0.05 DMRT.

Table 7. Effect of dolomite plus on biomass dry weigh, seed dry weigh, and RAE of the peanut yield on Inceptisols soil in the greenhouse experiment.

No.	Treatments	Biomass dry weight	Seed dry weight	RAE
		.... g per plant	....	(%)
T1.	Control	13.55 e	9.86 a	-
T2.	NPK	14.76 de	11.53 ab	100
T3.	NPK + dolomite1	15.18 de	11.18 ab	79
T4.	NPK + dolomite2	15.45 cd	12.72 bc	171
T5.	NPK + dolomite3	17.08 bc	11.88 bc	121
T6.	NPK + dolomite4	18.57 ab	14.65 c	287
T7.	NPK + dolomite5	17.13 bc	14.05 bc	251
T8.	NPK + dolomite2+animal manure	19.06 a	13.85 bc	299

Note: Numbers in the same column that are followed by the same letter are not siginificantly different at 0.05 DMRT.

weight of peanut seed untill 27%, *i.e*. from 11.53 to 14.65 g per plant. T6 also had significant different to dry weigh of peanut biomass compared to control and NPK fertilizer treatment.

Application of dolomite plus coombine with NPK fertilzer could affect the growth and yield of peanut. Dolomite plus is an ameliorant which containes dolomite and fosfat nutrient, so that it can supply magnesium, calcium, and phosphate nutrients, that are very important for formation of ginofor and filling pod of peanut. The addition of peanut ginofor would affect amount of pod. Therefore, total pod of peanut that was applied by dolomite plus will increase. Besides as supply Ca and Mg nutrients, dolomite plus also increase soil pH. This increasing soil pH will increase the availability of nutrient,

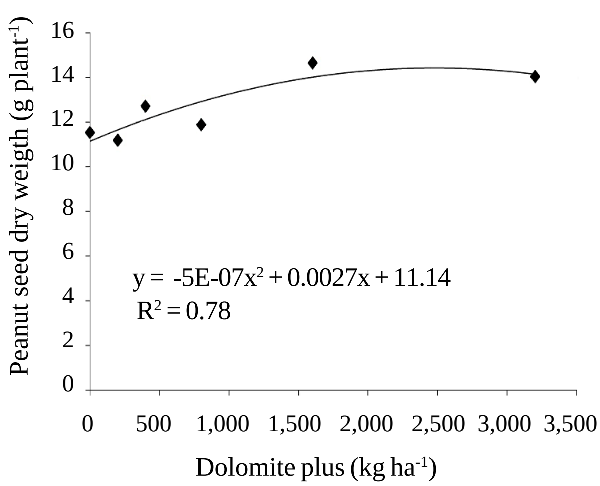

Figure 3. Effect dolomite plus rates combine with NPK fertilizer to dry weight of peanut seed on Inceptisols soil in greenhouse experiment.

especially P. P nutrient in soil is fixed by Al-P and Fe-P and it is not dissolved. Increasing of soil pH will affect the exchange of OH^- ion with P, so that P in $H_2PO_4^-$ will be released to soil solution and availabe for plant (Soepardi 1983). Therefore, will affect the increasing of filled pod, so that dry weight seed increased too.

The treatment of 1,600 kg ha^{-1} dolomite puls+NPK fertilzer (T6) was the rate that resulted the highest yield. Figure 3 shows that maximum dolomite plus rate was 2,500 kg ha^{-1}, and if more higher than this rate, the dry weigh of peanut seed began to decrease.

Application of dolomite plus with rates between 200 and 3,200 kg ha^{-1} combined with NPK fertilizer effectively increased dry weigh of peanut seed. It was shown by relative agronomiy effectiveness (RAE) value which was more than 100% i.e. 144-216% (Table 6). It means that application of dolomite plus could increase dry weigh of peanut seed untill 2 times compared to NPK fertilizer application.

CONCLUSIONS

Application of dolomite plus 1,600 kg ha^{-1}+NPK fertilizer (50 kg urea, 200 kg SP-36, and 150 kg KCl per ha) significantly increased dry weight of peanut seed untill 27% (11,53 to 14,65 g per plant) compared to NPK fertilizer treatment (50 kg urea, 200 kg SP-36, adn 150 kg KCl per ha). It is shown by RAE value which was more than 100% or about 171-251%. Application dolomite plus+NPK fertilizer increased soil pH, available P content (Bray 1 extractan), $Ca_{exc.}$, $Mg_{exc.}$, and CEC which were 1.9 unit, 6.2 mg kg-1, 15.87 cmol(+) kg^{-1}, 14.27 cmol(+)

kg^{-1}, and 17.29 cmol(+) kg^{-1}, respectively. Maximum rate of dolomite plus was 2,500 kg ha^{-1} with the peanut yield was 14,2 g per plant dry weigh of seed, and it more than this rate the peanut yield began to decrease.

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