



EFFECT OF GIVING SILVER BLACK PLASTIC MULCH ON 14 GENOTICS OF LONG BEANS (*Vigna sesquipedalis*)

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Abstract

Study this aim for knowing influence gift mulch plastic black silver on results and component results plant peanut long. hypothesis which filed that is there is influence gift mulch plastic black silver on the yield and yield components of long bean plants. Study this implemented in the garden test University Brawijaya which located in the village of Jatikerto. Located at an altitude of ± 330 m above sea level, with Alfisol soil type. This research was conducted in February May 2008. This research uses Draft Plot Divided (RPT) with plot main use mulch and child plot form genotype peanut long. Ma s ing each repeated 3 time. As for treatment that is TM = without mulch, M = with mulch, G1 until G14 = genotype peanut long. Variable which observed that is: Age flowering, Age harvest, Long pod, Amount pod planting, Weight pod planting, Amount seed per pod, Amount pod planting, Amount clusters planting, Potency results planting, Amount pod percluster. Data which obtained analyzed with use analysis variety and done test F on level 5%. If results testing show results which different real, then proceed with the BNT test at the level of 5%. Results study show that interaction real on use mulch plastic black silver to 14 genotype peanut long occur on variable total flower planting, total pod per cluster, total cluster planting. Significant interaction on the yield of long bean plants on the use of mulch seen on weight pod planting and weight pod plot. kindly whole, plant peanut long which planted with use Plastic mulch gives higher yields.

Keywords: Mulch, Genotype, Long Beans.

1. Introduction

Plant peanut long (*Vigna sesquipedalis*) is plant which including vegetables pod which favored by Public wide in this world. Peanut long, as plant legumes annuals, is plant food season hot which could adapt with good on all region tropical wet and currently. Peanut long tolerant on condition hot and dry, but no tolerant frozen. Seed dry and pod fresh usually used as food and part The vegetative part is used as fodder (Peksen, 2004).

Effort enhancement productivity very urgent because peanut long is vegetables which have mark nutrition tall. Until now problem deficiency energy and proteins still struck a number of country in this world, including in Indonesia (Kuswantoetal, 2003). On the pods, peanut long contain around 50 calories per 100g when cooked, with content proteins not enough from 3%. There is also vitamin C (around 15mg) and provitamin A (23 μ g RAE) as well as content folate (around 45g). Content nutrition on leaves young very good, that is contain 25% proteins from weight dry and is a high-quality protein (National Research Council, 2006). Therefore, long bean is a source of protein that is cheap and easy to develop in various regions (Rukmana, 1995).

productivity peanut long still very low, matter this caused because technique cultivation which applied not yet optimal. Planting peanut long on generally still very traditional, so that results production no optimal. Use mulch is wrong one application technology cultivation agriculture. With use mulch this could reduce competition plant to weed, Upgrade humidity land, balancing rate acidity (pH) land, reduce fluctuation temperature land, reduce evaporation land, so that humidity land could maintained, reduce damage (erosion) land because water rain, reduce washing hara especially Nitrogen and Upgrade activity microbiology land, reduce attack pest sucker (Thrips, mite and lice leaf) and disease transmitted land (fall sprouts and swollen roots) .



According to Purwowidodo (1983) for control evaporation water so use mulch is ingredient which potential for maintain temperature, humidity land, content ingredient organic, reduce total and speed Genre surface, Upgrade absorption water and control weed growth. By doing this research is expected capable knowing influence gift mulch plastic black silver on results and long bean yield components.

2. Methods

2.1 Place and Time

Study this implemented in the garden test University Brawijaya which conveniently located in D esa Jatikerto, Subdistrict Kromengan, Regency Poor. Is at on height ± 330 masl, with type land Alfisol. Study this held in February May 2008.

2.2 Tools and Materials

Ingredient which used for study this is 12 strain hope peanut long University _ Brawijaya that is from peanut long collection from Prof. Dr. Ir. Kuswanto, Ms and 2 varieties peanut long as comparison, that is variety KP-7 and varieties local aura White. Besides that used also Furadan. that fertilizer used that is fertilizer NPK 15:15:15 and Urea for Fulfill need plant nutrients.

Tool which used in study this Among other, mulch black silver used for repair air order land and availability water for plant, stake for help growth plant peanut long, rope raffia for tie stem plant on stake, rule for measure long pod, label for mark plant which used in observations, scales for measure heavy pods , planks name and marker for give name on each strain .

2.3 Research methods

Study use Draft Plot Divided (RPT) which repeated 3 times and as the main square is usage silver black mulch namely: Without using mulch (TM) , Using black silver mulch (M) . Whereas child plot is strain peanut long which consists from 12 strain peanut long hope and 2 varieties superior peanut long that is KP7 and White Aura. From treatment the obtained 28 unit combination treatment . Treatment repeated 3 time with randomization which different on plot main child plot on each repetition.

2.4 Implementation Test

The activities carried out in the research include:

a. Preparation

Land Processing land done with method hoe land which has loose then left During, ± 4 7 days. Next formed Becomes beds with wide 105 cm, long 400cm, and 10cm high.

b. Planting

Planting plant with distance plant that is 40x75 cm on each trial bed.

c. Care

Care plant covers stitching, installation ajir/turus, propagation, weeding, sprinkling, fertilization, and eradication pest. Stitching done if seed which planted no grow interval of 7 days after the first planting. 2. Installation of ajir / pillars is carried out week after plant on moment height plant already reach ± 25 cm, tall stake +2m. Aim installation stake is as media propagation plant, no bother between plant, and guard growth for optimal. Propagation done on moment plant has experience period growth vegetative which almost mature that is around 2 - 3 week. Propagation plant done so that plant could grow upright follow direction founding ajir/turus. Propagation done with method winding peanut long around stake in a

manner circular. Weeding done if grow weeds diareal planting. Planting plant peanut long already enter season drought, so that gift water need done be careful possible. Giving water with method inundate land with water. Fertilization first done 2 week after plant, with use fertilizer NPK ± 3 grams/hole plant. Fertilization second done 3 week after fertilization first with use fertilizer urea. Fertilization which third given hose 2 week after fertilization second with use fertilizer urea as much 4,5 grams per hole plant good on fertilization second or third.

2.5 Observational Variables

On every variable which observed originate from taking sample 10 plants randomly in each bed.

- a. Age flowering (hst), counted on moment flower blossom first on every plant. Observations were made when 50% interest from each line.
- b. Age harvest (hst), counted moment first harvest with pod cook. Done on moment 50% harvest from every line. Criteria pod cook is edible and the seeds inside the pods are not yet prominent .
- c. Average long pod planting (cm), be measured from base until end pod from average 5 pod which taken in a manner random on every plant of 10 samples.
- d. Average _ _ weight per pods (g), weighed with use scales, weighed from 5 pod which taken in a manner random on every plant of 10 samples.
- e. Average total seed per pod, counted total seed which there is pad average 5 pod which taken in a manner random on every plant from 10 sample.
- f. Average total pod planting, counted how many total pod in every plant on every time harvest.
- g. Amount cluster planting, counted moment start appear stalk flower compound plant.
- h. Amount pod per cluster, counted from total pod planting shared with total cluster per plant.
- i. Potency results planting, counted from total pod planting times by weight per pod .
- j. Potency results per plot, counted from conversion weight pod perplo deep shape/ha . Aphid attack scale, calculated from the intensity of the attack. In study this used scoring scale attack pest aphids to plant peanut long for determine level resilience plant, from resistant to very sensitive.

Table 1 . Aphid's attack scale

Scale	Symptom
0	No there is symptom attack
1	There is spotting yellow on the leaves in a manner no regular or not equally
2	There is spotting leaves , happened abnormality light form leaf
3	Form leaf experience change symptom twist .
4	Leaf twisted , symptoms point grow die , grow side shoots .
5	Side and point shoots grow dead , plant dwarf colored brown

2.6 Data analysis

For knowing interaction Among treatment mulch plastic black silver and genotype plant peanut long, done with analysis variant. If results count analysis show difference real on test F5%, so done mean difference test based on BNT test.

3. Results and Discussion

On study influence use mulch plastic black silver this variable which observed is age flowering (hst), age harvest (hst), average length pod planting (cm), mean weight per pods (g), average amount seed per pod, average total flower planting, average total pod planting, total cluster planting, total pod per cluster, potency results planting, potency results per plot, scale attack aphids Analysis results variety to variable which observed, will served in form Table anova and Table of average results of the Least Significant Difference Test (LSD) at the 5% level.

3.1 Average pod length, number of seeds per pod, and pod weight

Results analysis variety to average long pod show difference which real on treatment genotype with test BNT with a level of 5%. Average total seed occur difference which real on treatment genotype with test BNT with level 5%. Weight pod occur difference which real on treatment genotype with test BNT with a level of 5%.

Table 2. Average pod length and pod weight.

Treatment	Pod length (cm)	Weight pods (g)
Giving mulch		
Mulching	61.1	19.9
Without mulch	59.41	19.22
BNT 5%	mr	mr
Genotype		
Aura Putih	84.23g	35.13e
KP7	74.24f	25.65d
UB7017	46.55a	13.07a
UB7022	53.43abc	16.65abc
UB7023	55.9cd	16.47abc
UB7037	47.15ab	14.6ab
UB7038	52.92abc	15.45abc
UB7054	54.95bc	16.86bc
UB7064	47.02ab	13.52ab
UB7068	63.44de	18.38c
UB7070	71.25ef	24.15d
UB7073	71.88f	24.4d
UB7074	71.36ef	24.52d
UB7109	49.24abc	14.99abc
BNT 5%	8.35	3.59

Description: Numbers which accompanied alphabet which same on one column signify no different real according to BNT 5%.

Table 3 . Average number of seeds

Treatment Genotype	Amount seed	
	Mulching	Without mulch
Aura Putih	20.05de	20.05e
KP7	19.66de	19.64de
UB7017	19.81de	18.45abcd

UB7022	16.99a	19.91e
UB7023	17.17a	18.38abcd
UB7037	17.91abc	17.67a
UB7038	17.99abc	17.31a
UB7054	19.09bcde	18.19abc
UB7064	17.68ab	18.03ab
UB7068	19.16cde	19.13bcde
UB7070	19.89de	19.48cde
UB7073	19.95de	19.92e
UB7074	20.22e	20.04e
UB7109	18.74bcd	17.81ab
BNT 5%	1.44	1.44

Description: Numbers which accompanied alphabet which same on one column signify no different real according to BNT 5%.

From Table 2 can explained that treatment genotype on study influence gift mulch plastic to 14 genotype peanut long there is results different real on variable long pod. Genotype aura white have long pod Very long and different real with genotype which other. Genotype which Very short that is genotype UB7064. On variable weight pod, weight pod highest that is on genotype aura white and Lowest on genotype UB7017.

From Table 3 can explained that on variable total seed, total seed on planting use mulch, total seed more many there is on genotype UB7074 and total seed which Very a little there is on genotype UB7022 and UB7023. On planting without use mulch ,total seed more many on genotype aura white, UB7022, UB7073 and UB7074 , Total seed least in UB 7037 and UB 7038 genotypes.

3.2 The average age of flowering and harvesting of long bean plants

Results analysis variety to average age flowering not occur difference which real on treatment mulch and genotype with test BNT with level 5%. Average age harvest occur difference which real on treatment genotype with test BNT with level 5%. Age flowering and the harvesting age of long bean plants will be shown in Table 4 .

Table 4 . Age of flowering and harvesting of long bean plants

Treatment	Age flower (hst)	Age harvest (hst)
Giving mulch		
Mulching	35.90	45.83
Without mulch	36.33	46.19
BNT 5%	mr	mr
Genotype		
Aura Putih	36.00	45.00ab
KP7	36.00	45.00ab
UB7017	36.33	43.00a
UB7022	36.17	42.33a
UB7023	35.33	44.67ab
UB7037	36.33	46.83bcd
UB7038	36.67	48.33cd
UB7054	36.33	47.33bcd

UB7064	35.83	44.67ab
UB7068	36.33	46.17bcd
UB7070	36.00	48.00cd
UB7073	35.67	48.17cd
UB7074	36.50	45.83bc
UB7109	36.17	48.83d
BNT 5%	mr	2.73

Description: Numbers which accompanied alphabet which same on one column signify no different real according to BNT 5%.

From Table could explained that gift mulch on planting peanut long with variable age flowering and age harvest plant peanut long no there is difference which real with test Different Real Smallest (BNT) with level 5%. On treatment mulch, age flowering plant peanut long 35.90 hst and on treatment without gift mulch 36.33 hst. On variables of harvesting age, harvesting age of long bean plants in the treatment with mulch 45.83 hst and in the treatment without mulch 46.19 hst.

3.3 Average number of pods and number of flowers per plant

Results analysis variety to average total pod planting occur difference which real on treatment genotype and interaction Among treatment mulch with genotype on test BNT with level 5%. average amount flower planting occur difference which real on treatment genotype and interaction Among treatment mulch with genotype on test BNT with level 5%. Average total flower and total pod planting will be shown in Table 5 .

Table 5. Average total interest and amount pods per plant

Treatment Genotype	Amount flower		Amount pod	
	Mulching	Without mulch	Mulching	Without mulch
Aura Putih	54.20a	50.40a	48.13a	45.27ab
KP7	66.53de	62.13cd	60.67de	53.87cd
UB7017	67.69de	65.07cd	62.18de	58.87cd
UB7022	63.07cde	47.62a	56.80bcde	39.42a
UB7023	61.93bcd	50.40a	55.27abcd	43.67a
UB7037	64.91cde	76.60e	59.54cde	68.20e
UB7038	66.53de	64.00cd	59.47cde	53.53cd
UB7054	69.63e	60.78cd	62.63e	53.29cd
UB7064	66.33de	65.00cd	61.80de	56.87cd
UB7068	65.60cde	59.87bc	59.80de	52.80c
UB7070	58.71abc	53.53ab	52.42abc	44.47a
UB7073	63.60cde	59.80bc	57.87cde	52.09bc
UB7074	55.80ab	51.07a	49.97ab	43.67a
UB7109	77.13f	67.77d	72.27f	60.17d
BNT 5%	3.67	3.67	3.64	3.64

Description: Numbers which accompanied alphabet which same on one column signify no different real according to BNT 5%.

On Table 5 can explained that treatment genotype with variable total pod planting, total pod the most on planting with use mulch that is on genotype UB7109 and which Very a little

on genotype aurawhite. Whereas on planting without use mulch, total pod the most on genotype UB7037 and which Very a little that is UB7022, UB 7023 and UB 7070.

3.4 Average number of clusters per plant and number of pods per cluster

Results analysis variety to average total cluster planting occur difference which real on treatment mulch, genotype and interaction Among treatment mulch with genotype on test BNT with level 5%. Average total pod per cluster no occur difference which real with test BNT with level 5%. Average total cluster planting will displayed on Table 6 and total pod per cluster will displayed in Table 7 .

Table 6. Average number of clusters per plant

Treatment Genotype	Amount Cluster	
	Mulching	Without mulch
Aura Putih	16.33a	15.13a
KP7	21.20defg	18.53b
UB7017	21.76efg	20.07bc
UB7022	19.60bcd	13.67a
UB7023	20.00cde	14.53a
UB7037	20.64defg	23.93d
UB7038	21.00defg	18.20b
UB7054	22.50g	18.31b
UB7064	22.07g	19.60b
UB7068	21.93fg	20.00bc
UB7070	18.20abc	15.33a
UB7073	20.13def	18.38b
UB7074	17.89ab	15.20a
UB7109	25.07h	21.70c
BNT 5%	0.99	0.99

Description: Numbers which accompanied alphabet which same on one column signify no different real according to BNT 5%.

On Table 6 is described that treatment genotype with variable total cluster planting the most on planting with and without use mulch that is on genotype UB7109 and which Very a little that is genotype aurawhite.

Table 7. Number of pods per cluster of long bean plants

Treatment	Amount pod per cluster
Giving mulch	
Mulching	2.85
Without mulch	2.89
BNT 5%	
Genotype	
White Aura	2.99
KP7	2.89
UB7017	2.90
UB7022	2.91

UB7023	2.88
UB7037	2.88
UB7038	2.88
UB7054	2.85
UB7064	2.87
UB7068	2.68
UB7070	2.89
UB7073	2.86
UB7074	2.84
UB7109	2.82

BNT 5%

Description: Numbers which accompanied alphabet which same on one column signify no different real according to BNT 5%.

On Table 7 can explained that treatment genotype on study influence gift mulch plastic to 14 genotype peanut long with variable average total pod per cluster no there is results which significantly different in the BNT test with a level of 5%. The average number of pods per cluster on the 14 long bean genotypes ranged from 2.66 to 2.99.

3.5 Yield potential per plant and yield potential per plot

Results analysis variety to potency results planting occur difference which real on treatment mulch and genotype with test Different Real smallest (BNT) with level 5%. Potency results plot occur difference which real on treatment mulch and genotype with test BNT with level 5%. Potency results planting and potency results plot will shown in Table 8.

Table 8. Yield potential per plant and yield potential per plot

Treatment	Potency yield per plant (g tan-1)	Potency yield per plot (ton ha-1)
Giving mulch		
Mulching	1140.24b	38.01b
Without mulch	972.52a	32.42a
BNT 5%		
	24.69	0.82
Genotype		
Aura Putih	1640.05f	54.67f
KP7	1474.36ef	49.15ef
UB7017	789.83a	26.33a
UB7022	790.50a	26.35a
UB7023	821.24a	27.37a
UB7037	915.99abc	30.53abc
UB7038	876.97ab	29.23ab
UB7054	983.19abc	32.77abc
UB7064	805.61a	26.85a
UB7068	1036.51abc	34.55abc
UB7070	1170.26cd	39.01cd
UB7073	1341.53de	44.72de
UB7074	1148.01bcd	38.27bcd
UB7109	995.30abc	33.18abc

BNT 5%	273.65	9.12
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Description: Numbers which accompanied alphabet which same on one column signify no different real according to BNT 5%.

Potency results plot on treatment genotype occur difference which real between treatment. Potency results plot highest on genotype aurawhite with potency 54.67 tonha⁻¹. Genotype which approach results plot highest is UB7073 genotype with potential per plot of 44.72 tons ha⁻¹.

3.6 Aphid attack intensity

Observation intensity attack aphids done on moment plant aged 2 week after plant until with 9 week after plant, from observation which done obtained data average attack on every the week. Observation started from week second until week ninth. On planting with mulch and without use mulch no occur attack aphids on all genotype plant peanut long. Genotype plant peanut long in a manner whole stand to attack aphids

Potency results planting as well as potency results plot on study this pointing anadanya difference real on treatment mulch and genotype, will but no there is interaction between treatment. In accordance with Purwowidodo (1983) for control evaporation water so use mulch is ingredient which potential for maintain temperature, humidity land, content ingredient organic, reduce total and speed Genre surface, Upgrade absorption water and control growth weeds. Opinion which same also disclosed by Umboh (1999), that is surface silver intended so that reflection (reflection) radiation sun elevated. Height reflection radiation sun this have effect double. Effect first is zoom out hot which flow to land so that possibility temperature land could lowered, temporary effect second is enlarge radiation sun which could accepted by leaves plant so that possibility photosynthesis process can be enhanced.

Use mulch plastic black silver could push growth weeds on land cultivation, plant peanut long which planted with use mulch plastic, no disturbed by exists growth weeds. So that nutrition which available could used fully by plant peanut long in the growth process.

Use mulch plastic black silver could Upgrade humidity land, humidity land will awake because steam water which is lost on process evaporation will stuck by layer mulch and will returned again to land as a source of metabolism. Use mulch plastic black silver could parse level erosion land which caused because water rain. Water rain which fall down no live about the surface land and bring the particles because before When it hits the ground, the rainwater is retained by a layer of mulch.

Use mulch Upgrade results harvest planting as well as potency results per plot, but results which tall also depends from genotype which planted. Genotype aurawhite have potency results which tall compared to with other genotypes. Results study show that no occur interaction Among treatment gift mulch on planting peanut long with genotype use peanut long. Results analysis variety show that difference which real there is on treatment genotype. Genotype which Very superior is genotype white aura with an average pod length of 84.23 cm.

Component microclimate which disclosed by Widiningsih (1985) also raises interaction real on variable total pod. With use of mulch on planting peanut long, total pod his planting more much more than planting without using mulch.

4. Conclusion

Use mulch plastic black silver influence results from peanut long like total flower planting, total cluster planting, total pod planting potency results planting, and potency result per plot. Use mulch plastic black silver no influence component results plant peanut long like long pod, total seed, weight pods, number of pods per cluster, flowering age, harvest age, Genotype which produce results tall is genotype UB7073, then genotype which potentially for developed is UB7070 and UB7074.

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