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Influence Of Mulching Materials On Yield And Economic Returns Of Potato (*Solanum tuberosum l.*) In Gisesero And Muhira Sites Of Rwanda

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Abstract

A study on"Influence of mulching materials on yield and economic returns of potato (*Solanum tuberosum L.*) in Gisesero and Muhira sites of Rwanda" was conducted from 20th February to 10th July, 2022 with the main objective of investigating the influence of different mulches yield of Irish potato and to identify the effective mulching materials for potato producers recommendation. Water shortage, lack of irrigation facilities, high cost of weeding as well as high weed infestation were the problem found in the potato production at farm level. To find out the efficiency of different mulching materials, a field experiment was conducted in Randomized Complete Block Design (RCBD) with five treatments: Control (T1), Dead mulch made of bean stalk (T2), Live/*Mucuna pruriens*(T3), Live/ *Desmodium uncinatum*(T4) and Live/ *Lablab purpureus* (T5) replicated four times. The data on different physical growth and yield parameters were taken over agricultural season before and at harvesting. Data entry and analysis was done using MS- Excel and OPSTAT software. The ANOVA was performed followed by the Duncan's multiple range tests for separation of means into homogenous groups using the Least Significant Difference (LSD) at various levels of significance. From the experiment it was found that the highest tuber yield was obtained in bean stalk mulch for both Gisesero and Muhira sites, 31.92 tha^{-1} and 30.5 tha^{-1} respectively, which was followed by live/*Desmodium uncinatun* (27.31 tha^{-1}) for Gisesero site and live/*Lablab purpureus* (27.31 tha^{-1}) for Muhira site, Live *Mucuna pruriens* for both Gisesero and Muhira sites, 21.63 tha^{-1} and 19.96 tha^{-1} respectively, Live *Lablab purpureus* (18.28 tha^{-1}) at Gisesero site and *Desmodium uncinatum* (18.13 tha^{-1}) at Muhira site, and lowest tuber yield was obtained in control condition for both Gisesero and Muhira sites,15.59 tha^{-1} and 15.88 tha^{-1} respectively. In case of economics, the highest benefit cost ratio was found in bean stalk mulch (3.49) for Muhira site and 3.57 for Gisesero site. Thus, this practice is the most effective mulching material for the high production of potato at Gisesero and Muhira sites of Rwanda.

Keywords: *Solanum tuberosum*, Mulch, tuber, stalk, *Mucuna*, *Desmodium*, *Lablab*

Introduction

Agriculture, the most important sector of Rwanda's economy, accounts for one-third of the country's GDP. However, the sector is characterized by low production as a result of increasing soil fertility reduction over time, which is mostly due to constant cropping without proper nutrient input (Turamyenyirijuru et al., 2019). The potato (*Solanum tuberosum L.*) is a popular crop that is grown in more than 160 countries across the world (Farzana, et al., 2021)**.** It is the fourth most produced crop in the world, behind wheat, rice, and corn (Rajesh *et al*, 2018).

Irish potatoes are one of Rwanda's primary value chains, and they are huge in the north and northwest, but not so much in the rest of the country. The potato is a priority crop for Rwanda's Crop Intensification Program (CIP), which aims to assure a steady supply of fertilizer and better seed to small-holder farmers in order to increase productivity (Mugabo et al, 2018). Although potato is grown throughout the country, the majority of it is grown in four districts in the north-west: Rubavu, Musanze, Nyabihu, and Burera (Shimira *et al*, 2020).

Soil fertility is maintained in permanent agricultural systems by using organic and mineral fertilizers. In many regions of the world, particularly in Sub-Saharan Africa (SSA), inorganic fertilizer supply, use, and profitability have remained poor, despite increasing intensification of land use and expansion of crop cultivation onto marginal soils. Intensive soil cultivation is common in potato farming, which can lead to soil erosion. Erosion control has been explored using a variety of ways. Reduced tillage and mulching, for example, have proven to be effective (Du *et al*, 2022).

Living mulches are usually a legume intercrop placed between the rows of another crop that is growing at the same time. Although living mulch may provide some nitrogen to the crop, their major function is to conserve soil. The crop's roots help to keep the soil in place, while the stem and leaves aid to lessen the impact of rainfall. Living mulches require water and nutrients to grow, and if not maintained properly, they can compete with the main crop thus reducing yields (Stein*et al*., 2022). A wide range of crops have been successfully cultivated with living mulches. Crops that serve as a cover slow erosion, improve soil, smother weeds, increase nutrient and moisture availability, aid in pest control, and provide a slew of other advantages to the farm. At the same time, they can cut expenses, boost profitability, and even generate new revenue stream (Rupali.&Sandeep. 2017). For the above facts, two parallel field trials were conducted at Gisesero and Muhira sites of Rwanda to test the impacts of the various mulches on growth, yield and economics of potatoes.

Materials and Methods

The first field experiment took place at the University farm Busogo in the Busogo Sector, Gisesero Cell, Musanze District, Northern Province. Musanze is Rwanda's most mountainous district, with a volcanic soil type, which is loose and well aerated. Its climate has a mean temperature of 16.7°C and a large amount of rainfall ranging from 1400 to 1800 mm. It is located at 1°33'26" S and 29°32'39"E; Musanze-Rubavu road.
Light dry season from end-December to mid-February, heavy rainy season from mid-February to June, heavy dry season from June to end-August, and light rainy season from end-August to end-December are the four seasons in Busogo Sector. The majority of people in Busogo Sector live in rural areas and work in agriculture; potatoes, maize, wheat, beans, and vegetables are the main crops grown there (Uwiringiyimana, 2019).
The second field experiment took place in the field of COFAR (Cooperative defacilitateurs de Rubavu) which is located in Rugerero Sector, Muhira Cell, Rubavu District, Western Province.
It is on the Musanze-Rubavu road, at 1°41'27" S and 29°18' 2"E. Rugerero has an equatorial climate and is situated at an average altitude. The average temperature is 15 degrees Celsius on the vertices, with night time temperatures ranging from 6 degrees Celsius to 20 degrees Celsius near Lake Kivu's boundaries. The annual rainfall in the Rugerero sector ranges from 1200 to 1500 mm. The Land of Northwest Sector has a very rich soil, but it is shallow due to volcanic ash and lava decomposition, whereas the Land of Southeast Sector has deep soils, but they are poor, typically acidic, sandy clay, and are easily leached due to severe erosion. The Rugerero sector has suitable land for maize, coffee, and potato farming (Anon., 2018).
For both sites, field experiments were set up in one season, 2022A.Experiments were laid out in randomized complete block design with four replications each having five treatments, to make a total of twenty treatments (20). The area of the plot was 10.5 m^2 (3.5m length and 3m width). The spacing between plots and replications were 0.5m and 1m, respectively.T_1 was the control with no mulch,T_2 was dead mulch(bean stalk),T_3 was living *Mucuna pruriens*, T_4 was living *Desmodium uncinatum*, and T_5 was living *Lablab purpureus*.
Dead (bean stalk) mulch were locally collected and placed on the soil by hand at the rate of 10t/ha with 10cm thickness after soil preparation and potato planting to completely cover the soil (Lalit *et al*, 2019) Potato plants were able to grow through it.Living mulches such as *Desmodium uncinatum, Mucuna pruriens* and *Lablab purpureus* were planted after potato emergence between rows to avoid competition. *Mucuna pruriens* and *Lablab purpureus* were planted at 20cm spacing in rows while *Desmodium uncinatum* were spread in lines between Irish potato rows.
The seeds of living mulches were purchased from Rwanda Agriculture and Animal Resources Development Board (RAB). Hand hoeing was done in three and seven weeks following planting. Ridomil fungicide was applied 2 weeks after emergence two times for prevention at weekly basis. Fungicide Mancozeb (Dithane M_{45}) and insecticide Cypermethrin were applied in case of disease and insects appearance. A knapsack sprayer was used to apply those chemicals.
Potato seed of cultivar Kinigi from a well-recognized and certified seed multiplier were planted with a spacing of 30 cm between plants and 80 cm between rows during the 2022A season. At planting, Farmyard manure (FYM) as organic fertilizer were used at a rate of 20t/ha. At the first weeding and earthing up phases, a chemical fertilizer $NPK17^3$ was applied at a rate of 300kg.ha^{-1} in two splits.

Data collection and analysis

The five plants were tagged randomly from each plot for data collection. The data regarding to plant height, leaves number and stem diameter were taken at 45, 60, 75, 90 and 105 days after sowing. Yield and tuber grading have been taken at 135days after planting. The data collected were entered in MS-Excel and then analyzed by using OPSTAT software. The means were compared at 5% level of significance.

Results and Discussion

Number of leaves is one of the major growth attributing parameter in terms of biomass production. The leaf number per plant was found very significantly higher in mulch condition as compared to control condition. At 45 DAP the highest number of leaves was found in bean stalk mulch for both Gisesero and Muhira sites: 9.4 and 32 respectively. The lowest number of leaves was found in control condition for both Gisesero and Muhira sites: 8.05 and 22.1 respectively. At 60 DAP the number of leaves was found higher in bean stalk mulch (15.1 and 85 respectively) while the lowest number of leaves per plant was found in control condition for both Gisesero and Muhira sites: 12.05 and 49.8 respectively. At 75 DAP the number of leaves was found higher in bean stalk mulch for Gisesero and Muhira sites (37.85 and 185.5 respectively) while the lowest number of leaves per plant was found in control condition with 29.25 for Giseser site and in *Desmodium uncinatum* with 109.4 for Muhira site.

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At 90 DAP the number of leaves was found higher in bean stalk mulch for both Gisesero and Muhira sites (57.05 and 219.7 respectively) while the lowest number of leaves per plant was found in control condition for Gisesero with 43.9 and in *Mucuna pruriens* with 134.4 for Muhira site. At 105 DAP the number of leaves was found higher in bean stalk mulch for both Gisesero and Muhira sites (54.22 and 108.1 respectively) while the lowest number of leaves per plant was found in control condition for both Gisesero and Muhira sites: 38.51 and 66.25 respectively. The higher number of leaves in bean stalk mulch could be attributed to the organic matter from it after decomposition, penetration of nutrients deep into the roots of potato, soil erosion reduction and soil born diseases reduction. Similar observations were made by Santosh, et al., 2020.

Table 1. The potato leaf number as influenced by different types of mulche sat various dates of observation (number of days after plantation, DAP) The number of leaves after mulching experiment has been presented in the table below:

Site	Gısesero Ste					Muhıra Sıte				
DAP	45	60	75	90	105	45	60	75	90	105
Treatments										
Control	8.05a	12.05a	29.25a	43.95a	38.51a	22.1b	49.8b	112.8b	143.6b	66.25b
Bean stalk mulch	9.4a	15.1a	37.85a	57.05a	54.22a	32a	85a	185.5a	219.7a	108.1a
Mucuna(live)	8.7a	13.7a	33.15a	45.8a	46.67a	23.3b	57.25b	113.5b	134.4b	70.95b
Desmodium(live)	8.85a	14.9a	34.55a	47.95a	52.87a	22.06b	56.8b	109.4b	138.8b	68.5b
Lablab (live)	8.85a	12.45a	32.7a	45.35a	46.71a	27.5c	62.2b	146b	171.8b	86.15b
S.Em.±	0.54	1.41	6.32	7.31	7.36	1.97	7.21	9.27	10.76	5.6
C.D.	N/A	N/A	N/A	N/A	N/A	6.14	22.46	28.9	33.55	17.45

T_1:Control(no mulch),**T_2**:Dead mulch(beanstalk),**T_3**:Living mulch of *Mucuna*,**T_4**:Living mulch of *Desmodium*&**T_5**:Living mulch of *Lablab*

Table 2. The plant height as influenced by different types of mulches at various dates of observation (number of days after plantation, DAP) The plant night after mulching experiment has been presented in the table below:

Site	Gısesero Ste					Muhıra Sıte				
DAP	45	60	75	90	105	45	60	75	90	105
Treatments										
T1	20.9a	34.8a	36.1a	63.65a	67.35a	39.8a	50.31a	70.15c	81.23b	77.93b
T2	23.3a	44.1a	44.6a	78.25a	84.8a	48.46a	63.63a	85.75b	101.3a	99.08a
T3	21.7a	35.9a	37.25a	67.45a	73.45a	41.6a	61.13a	78.82c	91.95b	88.65b
T4	22.8a	37.8a	39.2a	74.65a	76.3a	41.4a	55.52a	78.35c	91.17b	87.87b
T5	21.4a	34.85a	37.05a	66a	69.15a	43.46a	62.4a	81.5c	94.25c	91.85c
S.Em.±	1.77	2.62	3.14	4.55	6.27	2.11	3.52	2.6	3.09	3.12
C.D.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	8.1	9.63	9.72

T_1:Control(no mulch),**T_2**:Dead mulch(beanstalk),**T_3**:Living mulch of *Mucuna*,**T_4**:Living mulch of *Desmodium*&**T_5**:Living mulch of *Lablab*

Plant height is one of growth attributing parameter. Potato height was found very significantly higher in bean stalk mulch for both Gisesero and Muhira sites: (23.3,44.1,44.6,78.25,84.8 and 48.46,63.63,85.75,101.3,99.08) and at 45, 60, 75,90 and 105 DAP respectively which was found significantly at par with *Desmodium uncinatum* (22.8,37.8,39.2,74.65,76.3) for Gisesero site and with *Lablab purpureus* (43.46,62.4,81.5,94.25,91.85) for Muhira site and at 45, 60, 75,90 and 105 DAP respectively.

The increased potato height in bean stalk mulched potatoes was possibly due to better availability of soil moisture and optimum soil temperature provided by the mulches. Changes in the plant height of potato have been observed by using different live mulches and bean stalk mulch increased the potato height than other mulches. Mulch materials created favorable condition for the growth of potato. Such response was mainly due to the physio-chemical and biological improvement occurred in the soil including favorable temperature and moisture regimes, nutrient availability and microbial activity in mulch condition. Among the different mulch materials bean stalk mulch was more effective, which ensured maximum vegetative growth with maximum foliage coverage, these result is in agreement with the findings of (Arash *et al*, 2012).

Stem diameter of plant is one of the major contributing parameter on the vigor of the potato plant. The stem diameter of plants was found highest in bean stalk mulch for both Gisesero and Muhira sites (2.96,3.96,41.16,3.36,2.66and 4.36,4.61,4.72,4.7,3.12) and at 45, 60, 75,90,105 DAP respectively which was found significantly at par with *Desmodium uncinatum* (2.88,3.88,4.08,2.61) at 45,60,75and 105DAP respectively and *Mucuna pruriens* (3.28) at 90DAP for Gisesero site and with *Lablab purpureus* (4.3,4.5,4.7,4.68,2.87) for Muhira site and at 45, 60, 75,90 and 105 DAP respectively. The mulching condition produced significantly higher stem diameter of plant as compared to the control condition and in case of mulching material, highest stem diameter of plant was found in bean stalk mulch. Mulch materials created favorable condition for the growth of plant which led to production of big stem; this result is in accordance with the findings of Namarata *et al*, 2021.

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Table 3. Potato stem diameter as influenced by different types of mulches at various dates of observation (number of days after plantation, DAP) The stem diameter of potato after mulching experiment has been presented in the table below:

Site	Gisesero Site					Muhira Site				
Day After Planting	45	60	75	90	105	45	60	75	90	105
Treatments										
T1	2.8a	3.6a	3.8a	3a	2.52b	3.96a	4.17b	4.28a	4.17b	2.63b
T2	2.96a	3.96a	4.16a	3.36a	2.66a	4.36a	4.61a	4.72a	4.7a	3.12a
T3	2.82a	3.82a	4.025a	3.28a	2.6b	4.18a	4.35b	4.52a	4.42b	2.84b
T4	2.88a	3.88a	4.08a	3.16a	2.61c	4.16a	4.33b	4.47a	4.32b	2.69b
T5	2.74a	3.74a	3.94a	3.22a	2.57b	4.3a	4.5c	4.7a	4.68c	2.87b
S.Em.±	0.17	0.18	0.18	0.13	0.02	0.1	0.05	0.1	0.08	0.06
C.D.	N/A	N/A	N/A	N/A	0.06	N/A	0.16	N/A	0.26	0.21

T_1:Control(no mulch),**T_2**:Dead mulch(beanstalk),**T_3**:Living mulch of *Mucuna*,**T_4**:Living mulch of *Desmodium*&**T_5**:Living mulch of *Lablab*

Table 4. Potato tuber grading as influenced by different types of mulches at various size of observation (Big size, Medium size and Small size) The potato tuber diameter after mulching experiment has been presented in the table below:

Site	Gisesero Site			Muhira Site		
Parameters	Grading/Big Size(Cm)	Grading/Medium Size(Cm)	Grading/Small Size(Cm)	Grading/Big Size(Cm)	Grading/Medium Size(Cm)	Grading/Small Size(Cm)
Treatments						
T1	35.15b	24.43b	21.23a	34.05b	25.13b	21.13a
T2	43.3a	28.88a	14.17a	41a	28.27a	16.17b
T3	37.37b	26.10b	16.68a	35.57b	26.32b	20.4c
T4	35.73b	26.26b	15.9a	33.83b	25.75b	20.33c
T5	37.86b	26.03b	17.45a	36.46b	26.62b	17.43b
S.Em.±	1.201	0.35	1.53	1.2	0.35	0.62
C.D.	3.74	1.09	N/A	3.74	1.09	1.94

T_1:Control(no mulch),**T_2**:Dead mulch(beanstalk),**T_3**:Living mulch of *Mucuna*,**T_4**:Living mulch of *Desmodium*&**T_5**:Living mulch of *Lablab*

In case of large size tubers (>30cm) the maximum number of large tubers were found in bean stalk mulch for both Gisesero and Muhira sites: 43.3 and 41 respectively while the minimum number were found in control condition (35.15) for Gisesero site and *Desmodium uncinatum* (33.83) for Muhira site which was statistically at par with Lablab purpureus for Gisesero and Muhira site 37.86 and 36.46 respectively. Medium sized tuber (25 -30cm) were found significantly higher in mulch condition as compared to the control condition. In bean stalk mulch the maximum numbers of medium sized tubers per plant were found for Gisesero and Muhira site: 28.88 and 28.27 respectively. The minimum number of medium sized tubers was found in control condition for Gisesero and Muhira sites: 24.43 and 25.13 respectively which was statistically at par with *Desmodium uncinatum* 26.26 for Gisesero site and *Lablab purpureus* 26.62 for Muhira site.

The highest numbers of small sized tubers were found in control condition for both Gisesero and Muhira sites, 21.13 and 21.23 respectively which was statistically at par with *Mucuna pruriens* (20.4) for Gisesero site and *Lablab purpureus* (17.45) for Muhira site. The minimum numbers of small sized tubers were found in bean stalk mulch for Gisesero and Muhira sites, 16.17 and 14.17 respectively. The higher yield of large sized tubers and medium sized tubers with mulch was due to the less resistance of soil and more uptake of water and nutrients which might have led to better development and growth of individual tuber and hence large-sized potato. The results were more pronounced in case of bean stalk mulch compared to other mulches and control condition because of optimum soil moisture and nutrient retention due to lesser weed competition and maintenance of soil cover; this is in line with the findings of Farzana *et al*, 2021.

Mulch materials showed significant difference on yield of potato. The maximum yield was recorded from bean stalk mulch for both Gisesero and Muhira, 31.92 tha^{-1} and 30.5 tha^{-1} respectively while the lowest yield was recorded in control condition for Gisesero and Muhira sites: 15.95 tha^{-1} and 15.88 tha^{-1} respectively which was statistically at par for *Desmodium uncinatum* (27.31 tha^{-1}) for Gisesero site and for *Lablab purpureus* (27.31 tha^{-1}) for Muhira site. Mulch materials created favorable condition for the growth of plant which led to the production of maximum yield per hectare. Mulch application resulted in a significant maintenance of soil temperature in the root zone and the conservation of soil moisture. The number and weight of tubers and tuber yield in the mulched treatment were significantly greater than on plots without mulching. Similar result with application of mulches was reported by Santosh, *et al*., 2020.

Table 5. The total potato tuber yield as influenced by different types of mulches at the harvest. The yield in tha^{-1} after mulching experiment has been presented in the table below:

Site	Gisesero Site	Muhira Site
Parameters	Yield(tha^{-1})	Yield(tha^{-1})
Treatments		
T1	15.95b	15.88b
T2	31.92a	30.5a
T3	21.63b	19.96b
T4	27.31b	18.13bc
T5	18.28bc	27.31b
S.Em.±	1.120	1.081
C.D.	3.488	3.275

T_1:Control(no mulch),**T_2**:Dead mulch(beanstalk),**T_3**:Living mulch of *Mucuna*,**T_4**:Living mulch of *Desmodium*&**T_5**:Living mulch of *Lablab*

Benefit-Cost Ratio

Benefit Cost Ratio is the discounted benefits divided by the discounted capital costs and the discounted net operating costs. The BCR will be greater than 1 whenever discounted benefits exceed discounted costs. A project with a BCR above 1 provides a net economic gain and can be considered economically justified. For both sites, the highest BCR were found in bean stalk mulch practices. In a budget constrained environment, projects should be prioritized according to their BCRs. A project with a higher BCR provides a greater benefit per dollar invested and should receive priority in the allocation of funding. This will ensure the efficient allocation of scarce resources (Anon., 2015). The economic returns after mulching experiment conducted at Muhira site have been summarized in the table below:

Table 6. Potato economics as influenced by different types of mulches from Muhira site

Treatments	Production cost(RWF)	Gross returns(RWF)	Benefit(RWF)	BCR
T1	3749524	5957143	2207619	1.59
T2	3273333	11439000	8165667	3.49
T3	4035238	7485714	3450476	1.86
T4	4130476	6800000	2669524	1.65
T5	4320952	10242857	5921905	2.37

T_1:Control(no mulch),**T_2**:Dead mulch(beanstalk),**T_3**:Living mulch of *Mucuna*,**T_4**:Living mulch of *Desmodium*&**T_5**:Living mulch of *Lablab*

Mulch materials showed high benefit cost ratio of potato compared to the control. The maximum BCR was recorded from bean stalk mulch (3.49) while the lowest BCR was recorded in control condition (1.59). The highest benefit cost ratio in bean stalk mulched treatment was due to the highest yield from it and the lowest production cost. The lower BCR from the no mulched treatment was due to low yield from it and high cost of production registered from it (Chanda *et al*., 2019; Solomon *et al*., 2019). The economic returns after mulching experiment conducted at Gisesero site have been summarized in the table below:

Table 7. Potato economics as influenced by different types of mulches from Gisesero site

Treatments	Production cost(RWF)	Gross returns(RWF)	Benefit(RWF)	BCR
T1	3654286	5664637	2010351	1.55
T2	3178095	11334034	8155939	3.57
T3	3940000	7681524	3741524	1.95
T4	4035238	9698194	5662956	2.40
T5	4225714	6491429	2265714	1.54

T_1:Control(no mulch),**T_2**:Dead mulch(beanstalk),**T_3**:Living mulch of *Mucuna*,**T_4**:Living mulch of *Desmodium*&**T_5**:Living mulch of *Lablab*

Mulch materials showed high benefit cost ratio of potato. The maximum BCR was recorded from bean stalk mulch (3.57) while the lowest BCR was recorded in control condition (1.55). The highest benefit cost ratio in bean stalk mulched treatment was due to the highest yield from it and the lower production cost. The lowest BCR from the no mulched treatment was due to low yield from it and high cost of production registered in this practice (Chanda *et al*., 2019; Solomon *et al*., 2019).

Conclusion And Recommandations

Soil fertility decline, Low soil moisture content, weed infestation are among the major constraints of potato production and its economic returns in Rwanda. To address on these issues, a study on the influence of different mulching materials on yield and economic returns of potato have been conducted. The experiment was conducted in Randomized Complete Block Design (RCBD) with five treatments such as control (T1), Dead mulch made of

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stalk bean (T2), Live *Mucuna pruriens* (T3), Live *Desmodium uncinatnum* (T4) and *Live lablab purpureus* (T5) replicated four times on Both Gisesero and Muhira sites. Bean stalk mulch was found to be more suitable mulching material for both sites compared to the live mulches such as *Mucuna pruriens*, *Desmodium uncinatum* and *Lablab purpureus* for potato crop productivity increase. The maximum yield was obtained from bean stalk mulch which was followed by *Desmodium uncinatum* at Gisesero site and *Lablab purpureus* at Muhira site, *Mucuna pruriens* at both Gisesero and Muhira sites, *Lablab purpureus* at Gisesero site and *Desmodium uncinatum* at Muhira site, the control condition as the least among other practices for both sites. The production of potato with the use of bean stalk mulch was found economical at both Gisesero and Muhira sites of Rwanda.Therefore, the farmers for these two sites are recommended to use bean stalk mulch for potato mulching to increase productivity and economic returns.

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Yield and Grading of Potato (*Solanum tuberosum* L.) as influenced by different Mulch Materials**.** Agrotechniques in Industrial Crops. 1(1): 1-10.