EVALUATION OF DIFFERENT VARIETIES OF SWEET POTATO INTERCROPPED AT DIFFERENT TIMES WITH PEPPER IN THE MANAGEMENT OF SWEET POTATO WEEVIL (*CYLAS PUNCTICOLLIS* BOHEMAN) IN UMUDIKE SOUTH EASTERN NIGERIA.

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SUMMARY

The African sweet potato weevil (*Cylas puncticollis*) is the number one constraint to sweet potato production in Nigeria. A field study was conducted at the National Root Crop Research Institute Umudike, Abia state during 2015 and 2016 cropping seasons to evaluate the effect of intercropping three varieties of sweet potato with hot pepper (*Capsicum frutescence* Linn) on the management of sweet potato weevil (*C. puncticollis)*. The experiment consisted of sweet potato intercropped with pepper using different times of introduction of pepper into sweet potato (i.e. pepper planted same time with sweet potato, pepper planted 2 weeks after sweet potato, 4 weeks after sweet potato, pepper planted 2 weeks before sweet potato and 4 weeks before sweet potato. The experiment was laid out in a Randomized Complete Block Design (RCBD) with three replicates. The plot size was 18m^2 each. Parameters evaluated included weevil population density, marketable and unmarketable weight of crop tuber, crop yield, root damage, root weight, yield loss and percentage colonization. Results from the study indicated lower insect pest populations were recorded in the intercrop plots (0.70, 1.17, 0.99, 1.05, 0.22 and 1.58) than sole crop plots (2.09, 2.17, 2.02, 2.03, 1.38 and 1.26) in both seasons. Results showed that the introduction of sweet potato 2 and 4 weeks after planting pepper were significant ($P \leq 0.05$) and gave lower unmarketable yields of sweet potato roots, lower colonization and lower yield losses of sweet potato roots than the sole crops. Hence, farmers should adopt the practice for effective control of sweet potato weevil especially, during dry seasons when the insect pest infestations are more prevalent.

Keywords: *Cylas puncticollis*, Dry season, Intercropping, Pepper population density, Sweet potato.

SWEET POTATO [*Ipomoea batatas* L. (Lam)] is an important and one of the most widely grown crops in Nigeria and the world at large (Stevenson *et al*., 2009). Currently, Nigeria is the largest producer of sweet potato in Africa with 3.46 million metric tons and second to China with 106 metric tons annually in global production (Mwanja *et al*., 2017). It has the potential for yield improvement and year-round availability (Eddison *et al*., 2009). It is a crop of great value widely grown in Sub-Sahara African, where it has helped in the eradication of poverty and increased food security due to its high productivity per unit area and time (NCRI, 2005). It is ranked the seventh most important crop in the world with a total production of 103 million tons in 2013. It is produced more in Asia, accounting for up to 76.1% of world production in 2013, followed by the African continent (19.5 %) (Soew-Mon and Min-Yang, 2015). In 2014, China, Nigeria, Uganda, Indonesia, and the United Republic of Tanzania were the five top producers of sweet potato (Soew-Mon and Min-Yang, 2015). Besides rice, wheat, maize, and cassava, it is one of the five most important crops in 40 developing countries. Sweet potato production, marketing and utilization have grown in the last decade to almost all ecological zones in Nigeria (NCRI, 2009). However, among the roots and tuber crops, it is the only crop with positive per capita annual rate of increase in production in sub-Saharan Africa (Rao, 2005). It has the potential for yield improvement and year-round availability (Elena, 2013). Sweet potato is an important food security and early maturity crop that can be intercropped with some crops as yam and maize and can also be mono cropped based on the famer intentions. It is a crop of great value widely grown in Sub-Sahara African, where it has helped in the eradication of poverty and increased food security due to its high productivity per unit area and time (NCRI, 2005). It supplies 3.9% of the caloric and 1.5% protein intake for human requirement. Globally, sweet potato ranks seventh among the most important food crops after wheat, maize, rice, potato, barley and cassava. More than 85% of the sweet potato production in Nigeria is carried out by farmers who maintained small farms and carry out their operations manually using traditional farm tools such as hoes and machetes (Pillai *et al*., 1987).

Sweet potato weevil (*Cylas puncticollis.*) is the most destructive insect pest of sweet potato in Nigeria causing serious hindrance to sweet potato production. *C. puncticollis* limits sweet potato production by damaging vines, tubers and occasionally the foliage. Adults and larvae bore into soft tissues of the stems and tubers leaving tunnels which may be partly filled with frass. Fungal pathogens invade the tunnels causing rot which give a bitter taste to sweet potato due to production of tarpenoid phytoalexins. Damage to potatoes by this insect continues through storage leading to the reduction in quantity and quality of yields. Young sweet potato plants which develop from infested cuttings may be so badly damaged that they may wilt and die. It is one of the most important biotic factors limiting sweet potato production in Africa (Kabir *et al*., 2001). Some cultural practices such as intercropping, prompt harvesting and earthing-up have been evaluated and proven to be effective in the control of *C. puncticollis* (Emana, 1990). However, each component of these cultural practices only reduced the effect of *C. puncticollis* and its population to a certain level. It is assumed that if some of these cultural practices are put together as components of an integrated pest management strategy a more effective management of *C. puncticollis* could be achieved.

Intercropping is the growing of two or more crops simultaneously on the same piece of land, in a definite pattern so as to produce a greater yield by making use of resources that otherwise would not be utilized by a single crop (Elena, 2013). It often reduces insect pest population compared with monoculture (Bukosvinszky *et al*., 2010). It is a common agricultural practice among small scale farmers in West Africa and also one of the most widespread traditional agricultural practices where it provides food and income at different periods of the year for the family (Emede and Adegoke, 2011).

As the world population is increasing rapidly and must have to fulfill their food requirement, an efficient technique for increasing productivity and to intensify land use is needed, intercropping serves as the most useful approach for this purpose. Generally, intercropping increases crop

diversity which provides both barriers to pest dispersal and more dwelling place for natural enemies thereby reducing both colonization of the crop by pests and their subsequent control (Risch *et al.*, 1987).

Pepper *(Capsicum* spp.) are moderately deep-rooted crops that belongs to the family Solanaceae and is among the most varied and widely used foods in the world (Dipeolu and Akinbode, 2008) Pepper has been reported to be effective in repelling insects and other garden pests because it contains a chemical component called capsaicin which irritates the eyes and skin of insects, animals and people and tastes bad to some pests making the host plant unappealing (Kathleen, 2010).

A number of control methods have been used to reduce crop losses caused by insect pests and diseases both in fields and storage. Chemical control has been reported to be ineffective in Nigeria and the farmers have resorted to use their own ability and other control methods. Intercropping is the most widely used management practice for *C. puncticollis* in our locality. The objective of this study was to evaluate the effect of three sweet potato varieties intercropped with pepper at different times on the population of *Cylas puncticollis.*

MATERIALS AND METHODS

The field experiment was conducted for 2 cropping seasons during the dry season (August to December 2015 and 2016) at the National Root Crops Research Institute farm Umudike. Umudike is located at latitude $05^{o}\ 29^{1}$N, longitude $7^{o}\ 33^{1}$E and altitude of 122 m above sea level in the rain forest agro-ecological zone of South Eastern Nigeria with average annual rainfall of 2046 mm.

Capsicum frutescens (‘Ose ngwa’) and three varieties of sweet potato: UMUSPO-3 (an orange fleshed), UMUSPO-1 (slightly orange fleshed) and BUTTER MILK (white fleshed) were selected for the study. Pepper was raised in the nursery for 6 weeks before it was transplanted to the field.

The sweet potato varieties were collected from National Root Crops Research Institute (NRCRI) Umudike while the pepper variety (Ose ngwa) was sourced from the local farmers in Umudike environs. The land was cleared, ploughed and harrowed to a fine tilth. Ridges were made using a tractor at 1m×0.3m spacing according to sweet potato agronomic practices. The experiment was laid out in a Randomized Complete Block Design (RCBD) with three replications. Each plot size measuring 4 m in width × 4.5 m in length (18 m^2) was used for the experiments. The spacing for the sweet potato was maintained at 1m × 0.3m in all the experiments, while that of the pepper was 1 m×0.5 m and these gave a total plant population of 33,333 plants per hectare for sweet potato and 20,000 plants per hectare for pepper.

The experiment consisted 18 treatments which included sole crops of the three varieties of sweet potato, sweet potato planted same day (SD) with pepper, pepper planted 2 weeks and 4 weeks before (WB) planting sweet potato and pepper 2 weeks and 4 weeks after (WA) planting sweet potato.

Data collection

Number of adult *Cylas puncticollis* and percentage colonization

The number of *C puncticollis* infesting sweet potato was determined by visual counting of the adult *C. puncticollis* from ten randomly selected plants. Plants were considered as colonized or infested when damage was evident on the stem base starting four weeks after planting (WAP). Total percentage infestation or colonization was calculated according to Mtunda *et al.* (2001) as follows:

$$\text{Infestation (\%)} = \frac{\text{Number of sampled plants infested}}{\text{Total number of sampled plants per plot}} \times \frac{100}{1}$$

Number and weight of sweet potato roots per plot at harvest

This was determined by counting the total number of the storage roots harvested per plot and weighing them using a Hana 50kg weighing scale. Storage Root Yield (t/ha) was calculated using the formula according to Mtunda *et al.* (2001).

$$Y\ (t/ha) = \frac{\text{Yield (kg)/Plot} \times 10000}{\text{Plot area } (m^2) \quad 1000}$$

The infested/damaged roots of the sampled plants

These were separated based on the external damage symptoms on a scale of 1-5 where 1 = 0% damage, 2 = 1-25% damage, 3 = 26-50% damage, 4 = 51-75% damage and 5 = 76-100% damage. The percentage of damaged roots was calculated using the formula by (Mtunda *et al.,* 2001).

$$\text{Damaged roots (\%)} = \frac{\text{Number of infested roots}}{\text{Number of infested roots + Number of healthy roots}} \times \frac{100}{1}$$

Harvested roots were separated depending on the size and healthiness of the roots into marketable and healthy when the weight of roots is greater or equal to 100 g and unmarketable and unhealthy roots when the weight of tuber is less than 100 g and unhealthy visually according to Mtunda *et al.* (2001).

Yield loss

The harvested roots were separated into weevil infested and non-infested groups and counted. Yield losses due to the weevils were determined by measuring the total weight of all the tubers, the weight of the *C. puncticollis* damaged tubers and then the weight of the remaining edible portion of the *C. puncticollis* infested tubers after the damaged parts were cut off. Yield losses due to *Cylas* weevil damage was expressed in percentages as described by Kabir *et al*. (2001)

$$\text{Yield Loss (\%)} = \frac{\text{Total Tuber Weight} - \text{Clean Tuber Weight}}{\text{Total Tuber Weight}} \times \frac{100}{1}$$

Data analysis

All data collected were subjected to analysis of variance using GENSTAT (2007). All data on insect pest counts were transformed using square root transformation before analysis. Significant means ($P<0.05$) were separated using Fishers protected Least Significant Differences (LSD) at 5% level of significance.

RESULTS

Table 1 shows the effect of time of introduction of pepper in sweet potato intercrop on population of sweet potato weevil. Result obtained from this experiment indicated a highly significant difference ($P \leq 0.05$) in the population densities of sweet potato weevil between some of the intercrop plots and their sole crops at 6, 8 and 10 weeks after planting in 2015. The sweet potato variety UMUSPO-1 consistently recorded lower insect pest population in all the intercrops than the sole crops and this was highly significant ($P \leq 0.05$) when compared with the sole crops. The variety UMUSPO-3 recorded lower weevil population in the intercrops at 10 weeks when sweet potato was introduced at 2 and 4 weeks after planting pepper (0.99 and 0.70) and this was significantly different ($P \leq 0.05$)) from the sole crop (2.17). In 2016, lower weevil population was recorded more in the intercrops than the sole crops. A significant difference ($P \leq 0.05$) was recorded between the intercrop and sole crop at 8 and 10 weeks after planting when UMUSPO-1 was introduced at 2 and 4 weeks after planting pepper (1.58, 1.17, 1.46 and 1.05 respectively) and the sole (2.32 and 2.02), also at 6 weeks after planting when the variety UMUSPO-3 was introduced 2 and 4 weeks after planting pepper (0.70 and 0.70) compared to the sole crop (1.87).

Table 2 shows the effect of time of introduction of component crop (pepper) on number of roots and root weight of sweet potato. in 2015 and 2016 cropping seasons. In 2015, there were no significant differences ($P \leq 0.05$) in number of roots and root weight of sweet potato between the

sole crops and the intercrops while also in 2016, no significant difference was recorded between the intercrops and the sole crops in all the sweet potato varieties except in number of roots per plot when Umuspo-3 was introduced 4 weeks before (38.30) and 4 weeks after pepper (40.30) while the sole recorded (9.80) and also when Umuspo-1 was planted same day with pepper.. Similar result was observed in root weight, in 2015 and 2016. No significant difference was recorded in the root weight between the intercrop and the sole crops for all the varieties.

Table 1: Effect of time of introduction of component crop (pepper) to sweet potato plots on population of *Cylas puncticollis*.

	2015 cropping season				2016 cropping season			
Treatments	4WAP	6WAP	8WAP	10WAP	4WAP	6WAP	8WAP	10WAP
Sole Umuspo-1	0.99	1.44	1.94	2.09	1.05	1.58	2.32	2.02
Sole Umuspo – 3	1.2	2.18	2.02	2.17	1.34	1.87	2.02	2.03
Sole Butter milk	0.88	1.17	1.05	1.26	0.88	1.29	1.58	1.38
Umuapo-1+ 4WB pepper	1.40	1.55	1.90	1.67	0.07	1.34	1.67	1.85
Umuspo-1 + 2WB pepper	1.17	1.58	1.078	1.17	1.17	1.44	1.77	1.87
Umuspo-1+ SD pepper	0.88	1.55	1.05	1.64	0.88	1.17	1.26	2.09
Umuspo-1+ 2WA Pepper	0.70	1.34	1.44	1.05	0.07	1.34	1.58	1.46
Umuspo-1+ 4WA Pepper	0.70	0.88	1.22	0.70	0.07	0.70	1.17	1.05
Butter milk + 4WB pepper	0.70	1.34	1.44	1.65	0.88	1.11	1.65	2.12
Butter milk + 2WB pepper	0.70	0.88	1.29	1.17	0.70	1.29	1.34	1.83
Buttermilk + SD pepper	0.88	1.17	1.52	1.17	1.11	0.88	1.29	1.34
Butter milk + 2WA pepper	0.70	1.17	1.22	1.34	0.88	0.70	1.22	1.05
Butter milk + 4WA pepper	0.70	1.34	0.88	0.70	0.88	1.05	1.05	1.22
Umuspo-3 + 4WB pepper	1.17	1.55	1.17	2.18	1.31	0.68	1.67	1.87
Umuspo-3 + 2WB pepper	1.17	1.09	1.05	2.08	1.34	1.70	1.58	1.58
Umuspo-3 + SD pepper	1.17	1.52	1.77	1.82	0.70	1.34	1.09	0.70
Umuspo-3 + 2WA pepper	0.707	0.88	1.26	0.99	0.88	0.70	1.77	1.95
Umuspo-3 + 4WA pepper	0.99	0.70	0.88	0.70	1.05	0.70	1.05	1.58
Grand Mean	0.91	1.26	1.40	1.44	0.99	1.17	1.05	1.61
LSD (0.05)	0.54	0.59	0.58	0.78	0.46	0.44	0.53	0.42

WAP= Weeks after Planting, WB=Weeks before, SD = Same day with pepper

Table 2: Effect of time of introduction of pepper on root number and root weight of sweet potato in 2015 and 2016 cropping seasons.

	2015 cropping season		2016 cropping season	
Treatments	Number of roots/plot	Root weight (t/ha)	Number of roots/plot	Root weight(t/ha)
Sole Umuspo-1	58.70	6.14	67.70	9.00
Sole Umuspo-3	54.70	4.44	9.30	1,04
Sole Butter milk	23.3	1.68	54.70	6.83
Umuspo-1+ 4WB pepper	52.70	4.66	54.70	6.95
Umuspo-1 + 2WB pepper	50.00	5.78	55.30	8.01
Umuspo-1 + SD Pepper	34.70	3.87	4.30	9.71
Umuspo-1+2WA Pepper	48.00	5.10	52.00	6.93
Umuspo-1+ 4WA Pepper	55.30	5.81	54.30	8.46
Buttermilk+ 4WB pepper	22.70	2.03	40.70	6.72
Buttermilk+ 2WB pepper	11.70	1.20	56.70	8.11
Buttermilk + SD pepper	36.00	3.70	51.30	6.27
Buttermilk+ 2WA pepper	30.30	2.79	56.00	6.30
Buttermilk +4WA pepper	34.70	3.03	60.00	9.36
Umuspo–3+ 4WB pepper	41.70	4.37	38.30	4.80
Umuspo-3+ 2WB pepper	45.70	5.13	8.70	0.47
Umuspo-3+ ST pepper	42.70	5.44	27.30	3.36
Umuspo-3+ 2WA pepper	39.00	4.07	24.00	2.40
Umuspo-3+ 4WA pepper	50.30	5.33	40.30	4.65
Grand Mean	40.7	4.14	45.90	6.08
LSD (0.05)	21.96	2.69	28.20	4.21

Table 3 shows the effect of time of introduction of pepper on marketable and unmarketable root weight of Sweet potato. There was no significant difference between the intercrops and the sole crop on the marketable yield of sweet potato in 2015 and 2016 cropping seasons. In 2015, a significant difference ($P \leq 0.05$) in unmarketable yield was recorded between the intercrops of Umuspo-3 (0.72, 0.23, 0.44, 0.21) and the sole crop (1.62) except when it was planted 4 weeks before pepper. Umuspo-1 also recorded lower yield in the intercrops though it was not significantly different from the sole crop. In 2016, a significant difference ($P \leq 0.05$) in unmarketable root yields was recorded between all the intercrops of Umuspo-1 (0.24, 0.16, 0.08, 0.08) and the sole crop (2.16) except when it was planted 4 weeks before pepper. Similarly, buttermilk recorded higher number of unmarketable root yields in the sole crop but it was not significantly different from the intercrop except at 4WB pepper. Umuspo-3 recorded a highly significant difference ($P \leq 0.05$) from the sole crop when it was planted 4 weeks before pepper whereas other intercrops were not significantly different from the sole crop.

Figures 1 and 2 show the effect of time of introduction of component crop on root damage, % colonization and % yield loss of sweet potato roots in 2015 and 2016 cropping seasons. Lower percentage root damage was recorded more in the intercrops than the sole crops. The lower sweet potato yield recorded in some of the intercrop plots could be as a result of erosion and water logging that occurred in the experimental field which affected some plots. Also, low rainfall especially during the 2016 cropping season affected the sweet potato. Another limitation in the study was that the pepper plants were attacked by crickets at the seedling stage which lowered pepper population in some of the intercrop plots and this contributed to the poor yield obtained from some of the intercrops

In 2016, result shows there was significant difference ($P \leq 0.05$) between the sole crops and almost all the intercrops of the three varieties of sweet potato except the variety buttermilk that had lower

root damage not significantly different from the sole crops and also the variety Umuspo-3 when planted at 4 weeks before pepper.

Table 3: Effect of time of intercrop introduction on quality of sweet potato yield

Treatments	2015 cropping season		2016 cropping season	
	Root weight (t/ha) for:		Root weight (t/ha) for:	
	Marketable harvest	Unmarketable harvest	Marketable harvest	Unmarketable harvest
Umuspo-1	5.11	1.03	6.83	2.16
Sole Umuspo-3	2.82	1.62	0.54	0.50
Sole Butter milk	1.61	0.07	6.26	0.55
Umuspo-1+ 4WB pepper	3.28	1.38	5.09	1.85
Umuspo-1+ 2WB pepper	5.09	0.68	7.77	0.24
Umuspo-1 + pepper SD Pepper	3.72	0.14	9.55	0.16
Umuspo-1+ 2WA Pepper	4.61	0.49	6.85	0.08
Umuspo-1 + 4WA Pepper	5.40	0.41	8.37	0.08
Buttermilk + 4WB pepper	1.38	0.53	4.83	1.88
Butter milk + 2WB pepper	1.07	0.07	7.91	0.20
Butter milk + SD pepper	3.55	0.14	6.13	0.13
Butter milk + 2WA pepper	2.52	0.27	6.03	0.27
Butter milk + 4WA pepper	2.94	0.09	9.30	0.05
Umuspo-3 + 4WB pepper	2.89	1.48	3.25	1.55
Umuspo-3 + 2WB pepper	4.41	0.72	0.38	0.08
Umuspo-3 + SD pepper	5.20	0.23	3.25	0.10
Umuspo-3+ 2WA pepper	5.11	0.44	2.26	0.13
Umuspo-3 + 4WA pepper	3.63	0.21	4.63	0.02
Grand Mean	3.57	0.56	5.51	0.56
LSD (0.05)	2.69	0.66	4.26	0.59

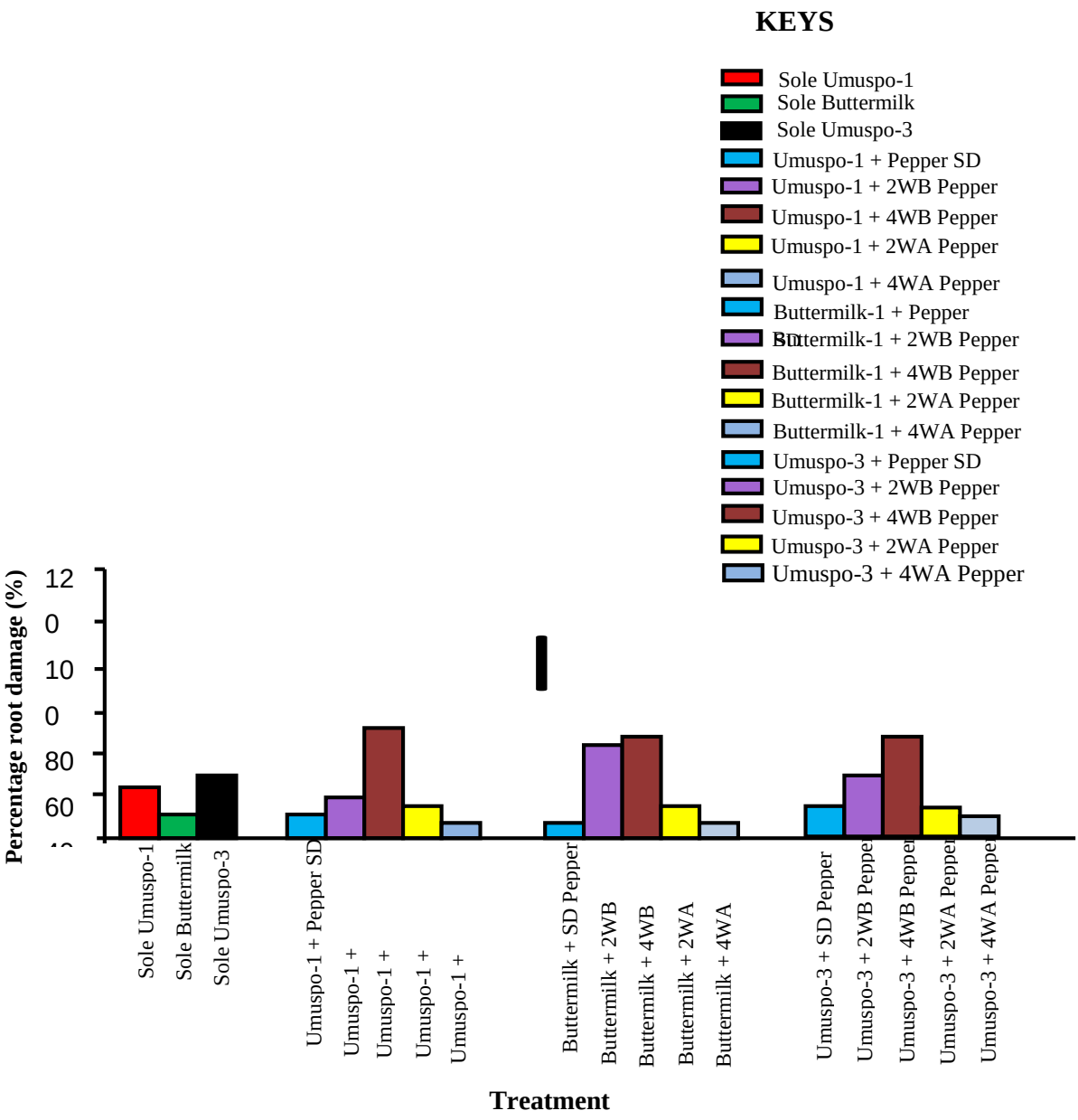

Figure 1: Effect of time of introduction of component crop on percentage root damage of sweet potato in 2015 cropping season

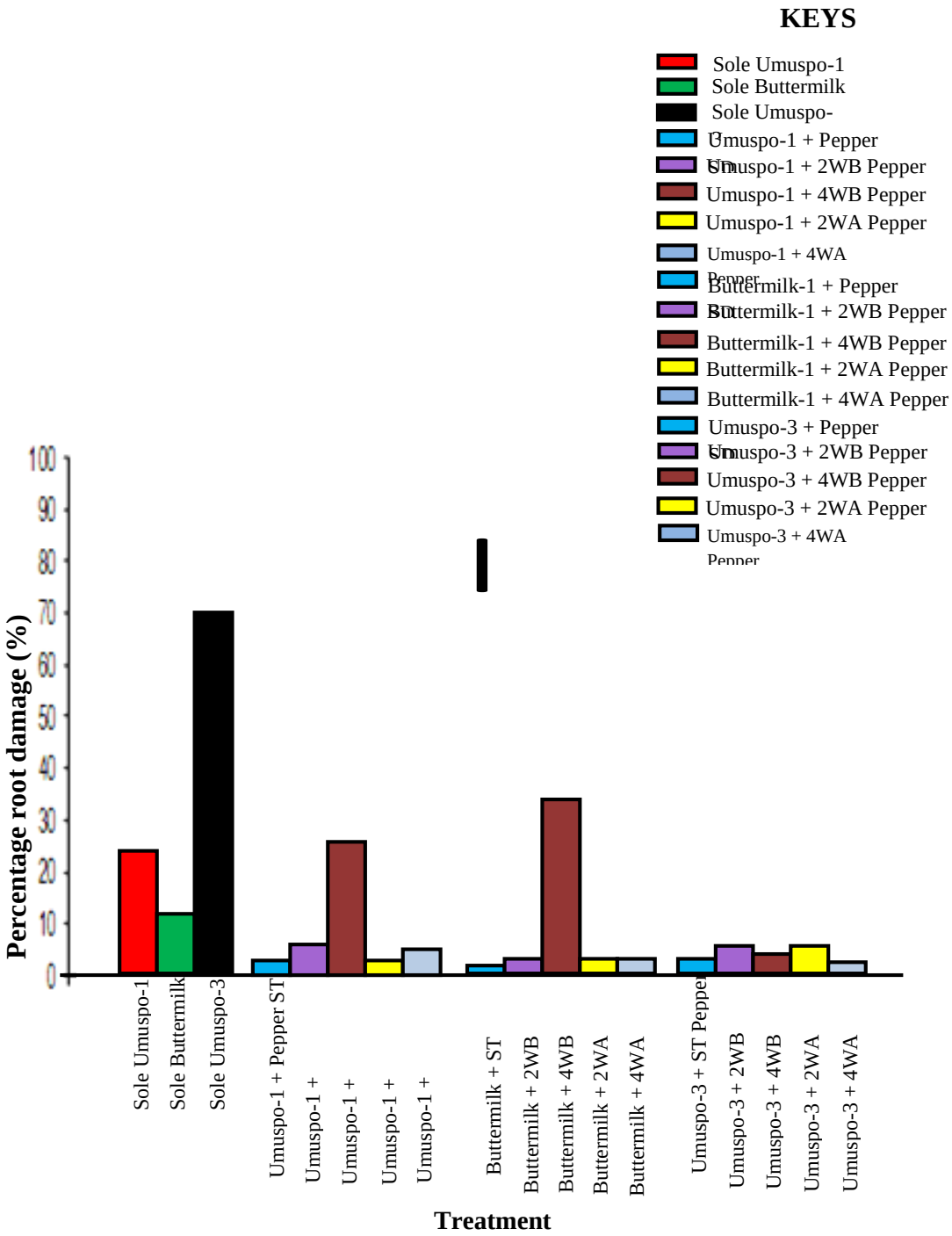

Figure 2: Effect of introduction of component crop on percentage root damage of sweet potato in 2016

Figures 3 and 4 show the effect of time of introduction of component crop on percentage colonization of sweet potato roots. Higher sweet potato root colonization was recorded in the sole crops compared to the intercrops in 2015 though this was not significant. A significantly higher colonization ($P \leq 0.05$) was recorded when Umuspo-3 was planted 4 weeks after pepper (15.50) while the sole recorded (57.50). In 2016 the intercrops generally recorded lower colonization than the sole crops though not statistically significant.

Figures 5 and 6 show the effect of time of introduction of pepper crop into sweet potato on percentage yield loss of sweet potato roots in 2015 and 2016 cropping seasons. In 2015, lower percentage yield losses of sweet potato roots were recorded in all the intercrops of the three sweet potato varieties though not significantly different from the sole crops, except when Umuspo-3 was planted 4 weeks after pepper (3.60) and this was significantly different ($P \leq 0.05$) from the sole crop (53.40).

In 2016, all the intercrops of Umuspo-1 and Umuspo-3 recorded highly significant difference ($P \leq 0.05$) in sweet potato yield loss compared to their respective sole crops except when planted 4 weeks before pepper.

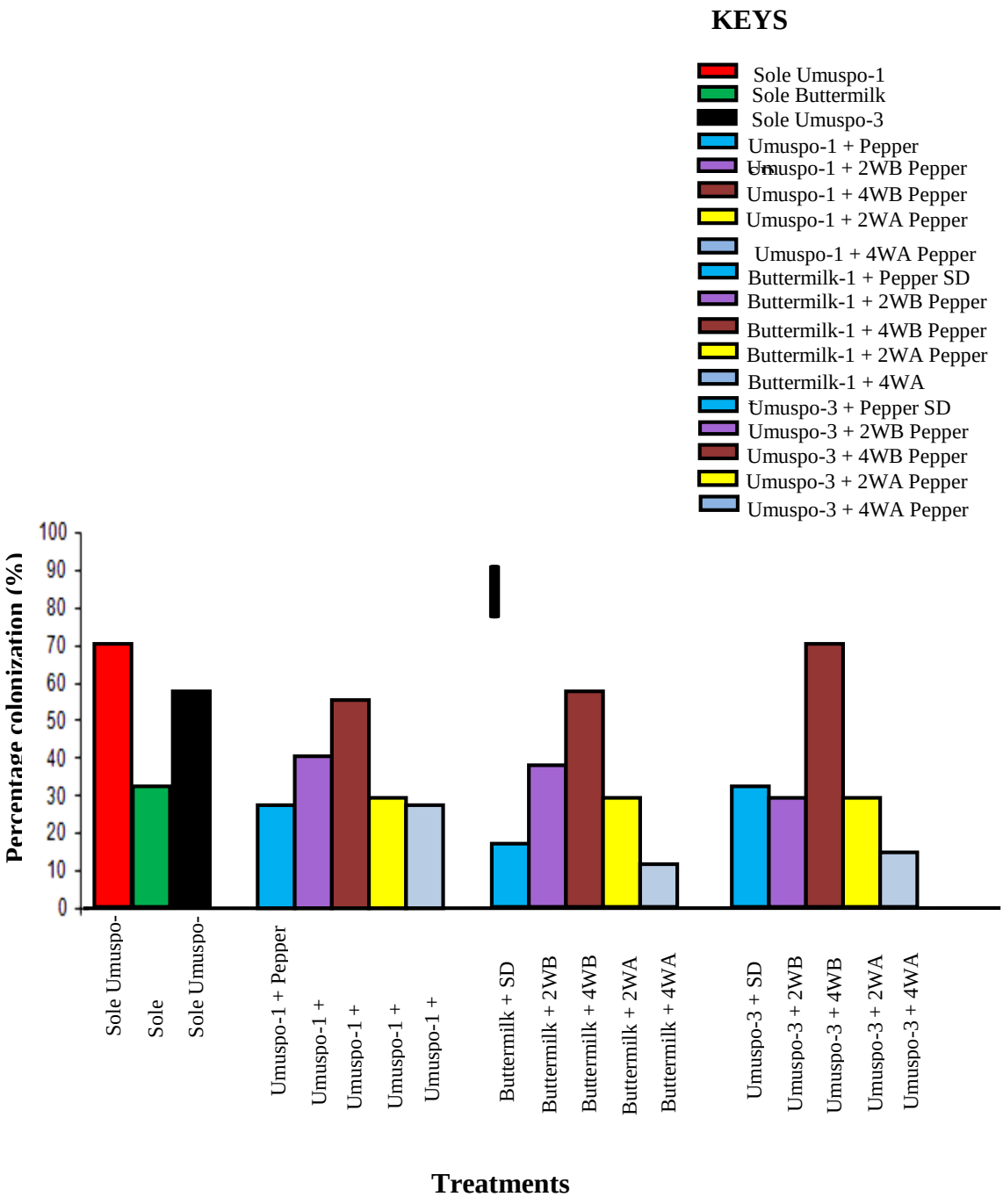

Figure 3: Effect of time of introduction of component crop (pepper) on percentage colonization of sweet potato roots in 2015 cropping season

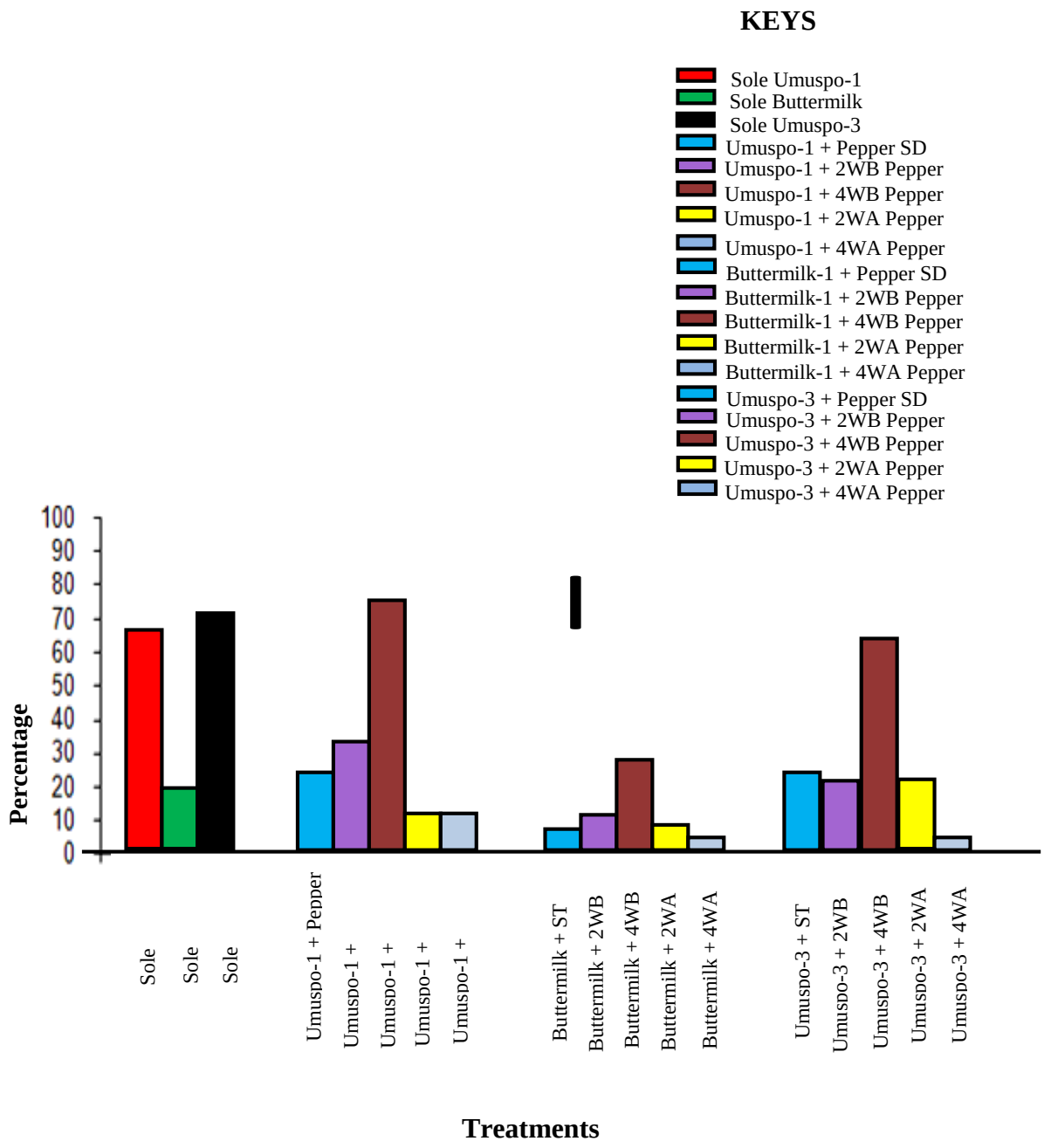

Figure 4: Effect of time of introduction of component crop (pepper) on percentage colonization of sweet potato roots in 2016 cropping season

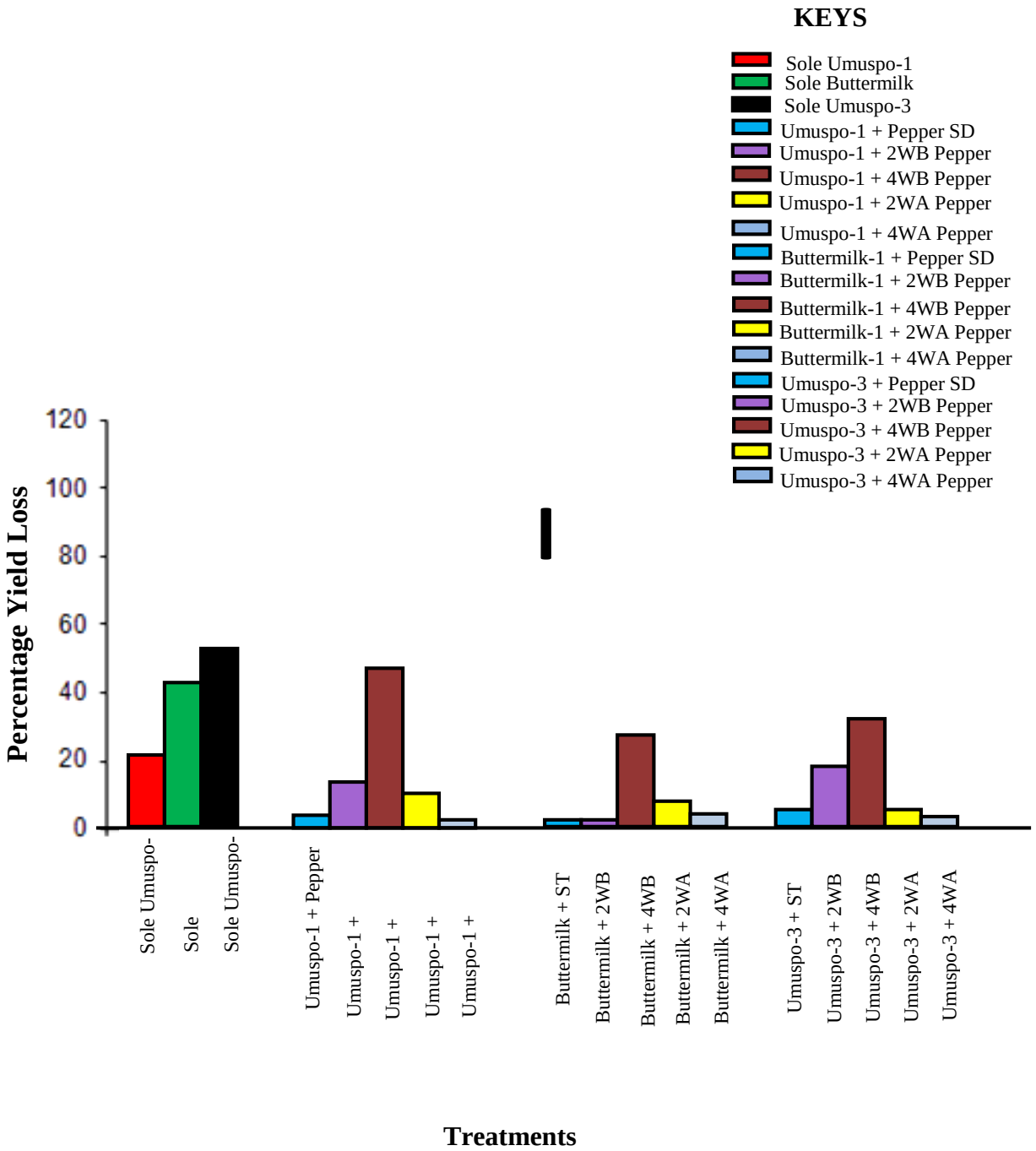

Figure 5: Effect of time of introduction of component crop (pepper) on yield loss of sweet potato roots in 2015 cropping season

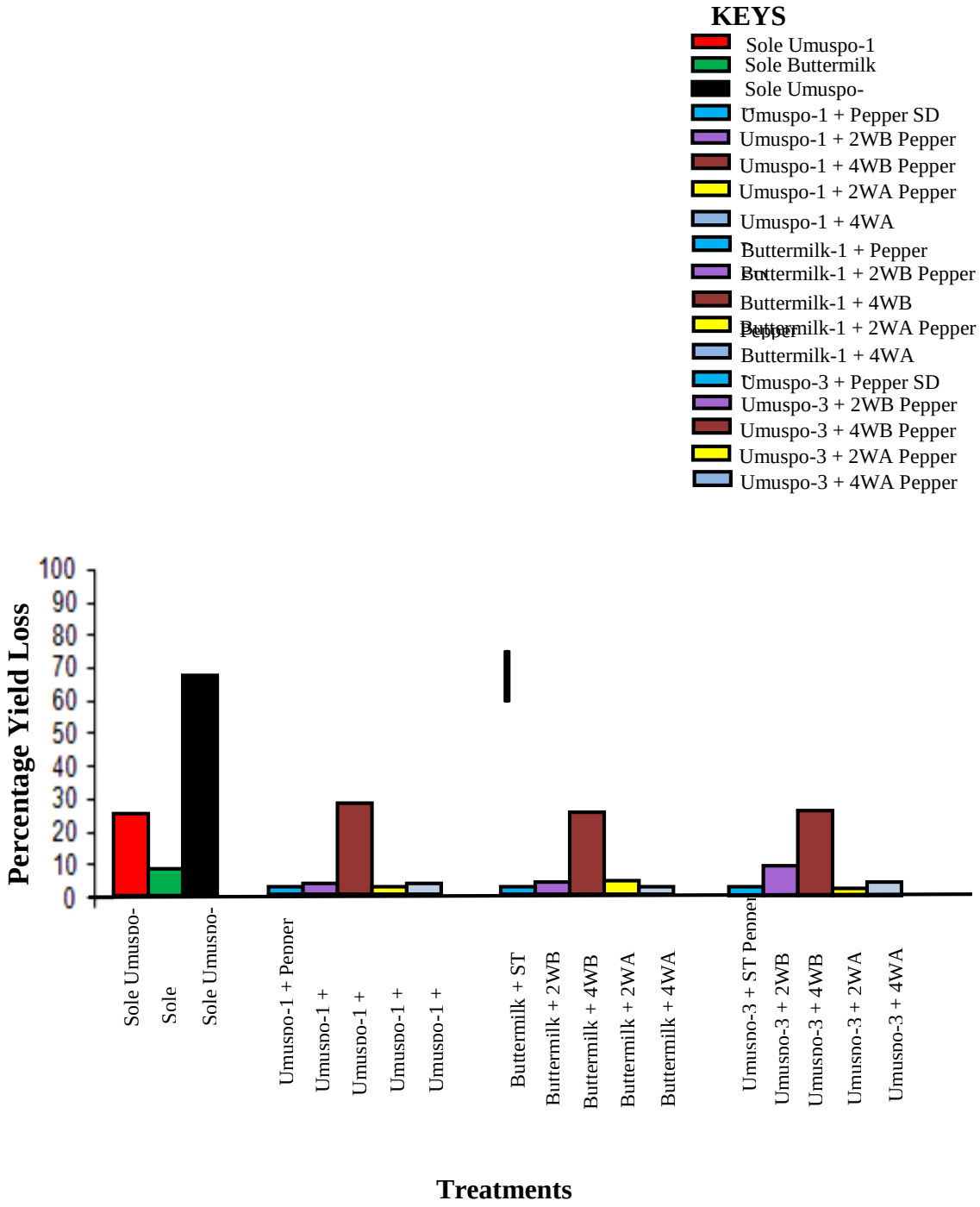

Figure 6: Effect of time of introduction of component crop (pepper) on yield loss of sweet potato roots in 2016

DISCUSSION

The results from this study has shown that early introduction of Pepper in a Sweet potato/pepper intercrop could control sweet potato weevil and subsequently increase the yield. It revealed that planting pepper at four weeks and two weeks before planting sweet potato was very effective in controlling the Sweet potato weevil than when Sweet potato was planted 2 and 4 weeks before planting pepper suggesting that sweet potato as a creeping plant with fast growing vines could easily cover the field thereby, overshadowing Pepper. This result corroborated the findings of Pillai *et al.* (1987 who reported that intercropping sweet potato with *Colocasia*, rice, or cowpea resulted in up to tenfold reduction in the infestation of sweet potato weevil (4.8 to 11.54 weevils per kg of tubers) compared to sole crop of Sweet potato (217.5 weevils per kg of tubers) in Kerala, India. It also corroborates the findings of (Asawalam *et al.,* 2012) who reported that intercropping cowpea with turmeric significantly lowered the population of *Aphis craccivora* Koch and *Riptortus dentipes* Fab. Similarly, Rao (2005) reported low incidence of *Cylas formicarius* in a multiple cropping system. According to Suris *et al*. (1997) and (Alexander, 1992) sweet potato intercropped with corn resulted in lower percentage of sweet potato weevil population than in pure stands. There was no significant difference in sweet potato yield between the intercrop patterns and the sole crops in both cropping seasons.

The highest weight of unmarketable yields of sweet potato was recorded in the sole crops followed by plots where Sweet potato was planted 2 and 4 weeks before Pepper. This finding agreed with Ashenafi *et al*. (20133) who reported that when pepper was intercropped with maize, it significantly reduced the aphid population, increased marketable fruits yield and reduced unmarketable fruit yield.

The introduction of sweet potato at 2 and 4 weeks after planting pepper recorded significantly lowered colonization and yield losses compared to when sweet potato was planted 2 and 4 weeks before pepper. Similar results regarding attack by sweet potato weevil (*C. puncticollis* and *C.*

brunneus) that cause up to 80% yield losses has been reported by Risch *et al.* (1987). The results from this study have shown that intercropping pepper and sweet potato is highly beneficial since it was able to check sweet potato weevil infestation and attack on sweet potato and enhanced yield in the sweet potato intercrop with pepper than in sole crops.

CONCLUSION

In this study, the time of introducing pepper in Sweet potato/Pepper intercrop proved effective in lowering Sweet potato weevil population and attack on Sweet potato in the field. Introduction of Pepper as a component crop especially before planting sweet potato and planting pepper at the same time with Sweet potato was effective in reducing Sweet potato weevil populations in the field. Sweet potato being a deep-rooted crop can conveniently be combined with Pepper being a shallow rooted crop for greater yields. The intercrop did not affect the potato yield. Based on the findings from the study, it is recommended that Pepper and Sweet potato intercrop be used by our poor resource farmers in the control of Sweet potato weevil as an effective alternative to synthetic insecticide in the management of the insect pests in the field. Supplementary spray using a good synthetic insecticide could be carried out before planting to control those crickets that affected pepper seedlings in the intercrop.

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