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On-farm Evaluation and Economic Implication of Neem (*Azadirachta indica*) and Siam Weed (*Chromolaena odorata*) Leaves Powder in the Management of Plant-Parasitic Nematodes Associated with Yam (*Dioscorea* spp.)

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Abstract

Plant-parasitic nematodes threaten yam production, causing yield losses and economic challenges. Eco-friendly management strategies are essential to reduce their impact while limiting synthetic nematicide use. This study was conducted in the late season of 2021 across two adopted villages of the Institute of Agricultural Research and Training: Ogbomoso (Oniyo) and Ibadan (Apete Onidoko) to evaluate the potentials of neem and siam weed leaves powder in the management of plant-parasitic nematodes in yam (*Dioscorea* spp.) field. Yam varieties were sourced from the adopted villages. Naturally infested farmers' fields were selected for the experiment. Neem and siam weed slurry at 5 tonnes/ha were applied as fertilizers at the base of plants. At post planting soil samples were taken to determine nematode population. Data on vine length, tuber yield (kg/ha), nematode parameters were recorded. Data collected were subjected to Analysis of Variance using Statistical Tool for Agricultural Research (STAR) version 2013. Means were separated using Duncan Multiple Range Test (DMRT) at a 5% probability level. Neem and siam weed at 5 t/ha effectively managed plant-parasitic nematodes, significantly reducing *Scutellonema bradys*, *Pratylenchus* sp., and *Meloidogyne* sp., while enhancing yam tuber. Also, the market analysis revealed that yam treated with neem extract had more economic returns due to larger tuber sizes, weight, and number of tubers recorded at harvest. These findings highlight neem and Siam weed as sustainable and eco-friendly management method, contributing to improved yam productivity and offering a viable alternative management method to synthetic nematicides in yam production.

Introduction

Yam (*Dioscorea* spp.), a tuber crop of the Dioscoreaceae family, is a significant staple in tropical regions such as West Africa, Central Africa, and the Caribbean. Known for its nutritional and pharmaceutical properties (Obidiegwu *et al*., 2020). Yam plays a vital role in food security and cultural practices. Recent data indicate that global yam production exceeded 73 million tons in 2021, with over 90% of this output from West Africa. Nigeria and Ghana alone contribute approximately 66% of the global yam supply (FAO, 2023). Yam has superior storage quality, and ability to provide essential dietary carbohydrates and income for millions (Hgaza *et al*., 2021). Despite its significance, yam production faces several challenges. Yam productivity is threatened by plant-parasitic nematodes, including *Meloidogyne spp.* (root-knot nematodes), *Scutellonema bradys*, and *Pratylenchus spp.* These pests cause severe damage, such as dry rot, cracking and galls, resulting in yield losses of 25–38% in Nigeria's major yam-producing areas, and reduction in market value of tubers (Onyenobi, 2022). Nematode infestations also compromise tuber quality during storage, exacerbating postharvest losses (Bridge *et al*., 2021).

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Synthetic nematicides are commonly used for managing nematodes but are costly and environmentally hazardous. Organic amendments and plant-based nematicides are gaining attention as sustainable alternatives. Recent studies have demonstrated that organic soil treatments and plant extracts possess significant nematicidal properties and can effectively reduce nematode infestations while enhancing crop yields (Hassan *et al*., 2021). These eco-friendly solutions are more accessible to resource constrained farmers and mitigate the environmental risks associated with chemical nematicides.

In Southwest Nigeria, limited research exists on the use of bionematicides to manage plant-parasitic nematodes and their impact on yam quality and proximate content. This study investigated the efficacy of extracts from two locally available plants as organic amendments for controlling plant-parasitic nematodes in yam production. These amendments aim to improve yam quality for domestic and export markets, while addressing the challenges of nematode infestations. It also promotes sustainable agricultural practices, support farmers' livelihoods, and reduces reliance on synthetic nematicides (Aghale, 2023).

Siam weed leaves was originally introduced in Nigeria in the year 1937 and Southern Africa in the 1940s (Wise *et al*., 2007) which serves an excellent fallow crop in arable farming due to its fast growth and ability to suppress other weeds and used as a green manure (Iyagba and Offor, 2013). The industrial applications of *Azadirachta indica* in medical, agrochemical, cosmetics, soap, pharmaceutical and wood industries generate considerable revenues in the value chain and various uses (Muhammad, 2016), which can provide estimated economic and ecological services worth US$24,000 in its 250 years life span (Saxena, 2012). Institute of Agricultural Research & Training has conducted research on the use of plant-based botanicals in the control of plant-parasitic nematode in yam on-station with a perfected technology on the use of neem (*Azadirachta indica*) and siam weed (*Chromolaena odorata*) powder in nematode control in yam. However, this study is to evaluate the effect of neem and siam weed leaves powder on the growth and yield of yam in two of the institute's adopted villages.

Materials and Methods

Experimental Site/Materials

The study was carried out in On-Farm Research (OFR) stations managed by IAR&T. The study areas were on the farmers' fields at two adopted villages Oniyo and Apete Onidoko, Oyo State, Nigeria. Prior to selection a preliminary survey was conducted in farmers' fields to determine the presence and extent of plant-parasitic nematode infestation. Infestation levels were evaluated through nematode extraction and quantification from collected soil samples. Nematode populations ranged from 250 to 1,850 juveniles per 100 g of soil, indicating moderate to high infestation across the sampled fields. For the study, two yam varieties each from Oniyo (TDY/02/565 and Ewuru) and Apete Onidoko (Kila 1 and Kila 2) were sourced from farmers in each location. The varieties were selected based on preference and variety grown in the selected villages. The experiment was conducted as a multi-location field trial. Although the same treatment structure was applied across locations, varietal composition differed between Oniyo and Apete Onidoko, allowing assessment of treatment effects under different environmental conditions. The fresh leaves of neem (*Azadirachta indica*) and siam weed were obtained from the farm at the Institute of Agricultural Research and Training (IAR&T), Apata, Ibadan. These indigenous plant materials were air dried and blended into powdery form less than 1,000 micrometres and used for the preparation of biopesticides slurries.

Land Preparation: This was carried out by manual slashing of the experimental site followed by mechanical ploughing and harrowing. Ridges were made and yam setts were planted directly to the field.

Nematode Inoculum Density: The nematode population present in the soil was determined at pre-planting and post planting. Soil samples were randomly collected from each plot with soil auger to a depth of 0-30 cm and bulked together to determine nematode population in the soil using the method Whitehead and Hemming (1965) nematode extraction techniques.

Nematode Extraction: Soil samples were taken for nematode extraction using the tray extraction method of Whitehead and Hemming (1965). Extraction and identification of nematodes were carried out in the Nematology Unit at International Institute of Tropical Agriculture (IITA). Double-ply nematode extractor tissue paper was sandwiched between two plastic sieves of 15 cm inside diameter. Sieves were placed 25 cm inside a bowl of bigger diameter, in which each 250 g sub-soil of the composite soil was placed and spread evenly, labelled and arranged on the laboratory bench. Debris and pebbles were removed and soil lumps were carefully broken in order to allow easy movement of the nematodes out of the soil into water. Water was gently poured to the plastic bowl and the set up was left undisturbed for 24 hours.

Thereafter, the plastic sieve containing the soil was removed briskly, allowed the last water to drop and the nematode suspension in the bowl was poured into a 500 ml Nalgene wash bottle. Nematode suspension in the Nalgene bottle was topped up with water to factory-calibrated point and left undisturbed for 5 hours to ensure that most nematodes settled down to the bottom of the bottle. The supernatant was siphoned out with the aid of a 3 mm inside diameter siphoning tube. The suspension containing nematodes was, thereafter, poured into a McCartney bottle and immediately refrigerated at 15°C prior to quantification of the nematodes. Nematodes were counted using Doncaster (1962) ringed nematode counting dish. The initial volume of nematode suspension was determined using 100 mL measuring cylinder and the volume was adjusted to a known volume for the nematode suspension. The suspension was agitated by blowing air through it using a pipette and 1 mL sub-sample was immediately pipette and transferred into the counting dish, which then was placed under a stereo microscope and the total numbers of nematodes found were counted with the aid of a tally counter.

Treatment Application: At 2 weeks after germination (WAG), yam plants were treated with *Azadirachta indica* (5 tonnes/ha) and *Chromolaena odorata* (5 tonnes/ha) powders, while the farmer's practice serves as the (control). Plate 1 shows the preparation of the leaf powder slurry used for the treatments. The leaf powders were the incorporated into the soil at the depth of approximately 1 centimeter around the base of each plant. Plate 2 shows the application of the leaf powder slurry.

Experimental Layout: The experiment was arranged in a 2 × 2 factorial design consisting of two yam varieties and two treatment levels (control and plant-based amendments) fitted into Randomized Complete Block Design with four replicates. The plot size was 3 m x 2 m with an inter-row spacing of 1 m while intra-row spacing was 1 m for yam. Yam sets were planted on ridges.

Data Collection: Data were collected on agronomic parameters (Vine Length), Yield (Weight and Number of Yam); nematological parameters (Nematode Population, Number of Galls, Gall index) and economic implications (Price and Revenue).

Data Analysis: Data obtained were subjected to descriptive statistics, correlation and General Linear Model (GLM). Means of significantly different variables were separated using Duncan Multiple Range Test (DMRT) at 5% probability level.

Results and Discussion

Effect of neem and Siam weed on plant-parasitic nematode populated soil (200ml) in yam at Oniyo and Apete Onidoko villages of Oyo state.

The effect of treatments on nematode populations and gall formation varied significantly ($P \leq 0.05$) across locations and yam varieties. Nematode populations were expressed as the mean number per soil sample per plot. At Oniyo (Table 1a), the control plots recorded the highest populations of *Scutellonema bradys* (773.25), *Pratylenchus* sp. (731.88), and *Meloidogyne* sp. (532.38), alongside the highest number of galls (56.00) and gall index (4.00). Similarly, Ewuru yam treated with siam weed at 5 t/ha showed relatively high nematode populations, with *S. bradys* (677.67), *Pratylenchus* sp. (612.00), and *Meloidogyne* sp. (448.25), as well as (47.58) galls and a gall index of (4.00), indicating limited suppression of nematode activity.

At Apete Onidoko (Table 1b), TDY/565/02 combined with neem at 5 t/ha consistently reduced nematode populations, with *S. bradys* (549.25), *Pratylenchus* sp. (468.13), and *Meloidogyne* sp. (361.63), and also recorded the lowest gall number

(30.50) and reduced gall index (3.50), demonstrating superior nematode suppression compared to other treatments. Ewuru + neem at 5 t/ha also reduced nematode populations, with *S. bradys* (579.83), *Pratylenchus* sp. (522.08), and *Meloidogyne* sp. (553.58), with (37.92) galls and a gall index of (3.67).

Effect of Neem and Siam weed on Vine Length of Yam at Oniyo and Apete Onidoko

At Oniyo, growth parameters showed significant differences across treatments. TDY/565/02 + neem consistently outperformed others, starting at 2 WAG (22.13) and peaking at 18 WAG (179.38). Control plots exhibited the lowest growth, ranging from 2 WAG (10.75) to 10 WAG (88.13). TDY/565/02 + Siam weed showed average growth 2 WAG (15.75) to 18 WAG (155.88) respectively. Ewuru + neem, and Ewuru + siam weed also exhibited average growth, peaking at 177.08 cm and 151.83 cm, respectively. Neem treatments for both TDY/565/02 and Ewuru were most effective in enhancing growth (Table 2a).

At Apete, Kila 1 + Neem achieved the highest growth 18 WAG (77.75), closely followed by Kila 2 + Neem 18 WAG (76.86), both showing a percentage increase over the control (55.90) by over 38.0%. siam weed treatments, such as Kila 2 + Siam-weed (66.25) and Kila 1 + siam-weed (60.00), showed improvements over the control but were less effective than neem based treatments (Table 2b).

Plate 1: Preparation of Leaves Powder

Plate 2: Application of Leaves Powder

Table 1a: Effect of Neem (*Azadirachta indica*) and Siam weed (*Chromolaena odorata*) on (200ml) soil plant-parasitic nematode population in TDY/565/05 and Ewuru Yam in Oniyo Village, Oyo State

Treatments	***Scutellonema bradys***	***Pratylenchus* spp.**	***Meloidogyne* spp.**	**No of Galls**	**Gall index**
Control	773.25[a]	731.88[a]	532.38[a]	56.00[a]	4.00[a]
TDY/565/02 + Neem @ 5 tonnes/ha	549.25[b]	468.13[c]	361.63[c]	30.50[c]	3.50[b]
TDY/565/0 + Siam weed @ 5 tonnes/ha	713.75[a]	651.13[b]	458.75[b]	41.75[b]	4.00[a]
Ewuru + Neem at 5 tonnes/ha	579.83[b]	522.08[b]	553.58[b]	37.92[b]	3.67[b]
Ewuru + Siam weed @ 5 tonnes/ha	677.67[a]	612.00[a]	448.25[a]	47.58[a]	4.000[a]

Means with the same letters within columns are not significantly different at 5% level of probability

Table 1b: Effect of Neem (*Azadirachta indica*) and Siam weed (*Chromolaena odorata*) on (200ml) soil plant-parasitic nematode population in Kila 1 and Kila 2 Yam at Apete Onidoko Village, Oyo State

Treatments	***Scutellonema Bradys***	***Pratylenchus* sp.**	***Meloidogyne* sp.**	**No of Galls**	**Gall index**
Control	813.71[a]	737.14[a]	724.14[a]	66.14[a]	4.00[a]
Kila 1 + Neem @ 5 tonnes/ha	537.50[c]	571.42[c]	507.33[c]	59.83[b]	4.00[a]
Kila 1 + Siam weed @ 5 tonnes/ha	753.09[a]	687.27[a]	517.64[b]	63.00[a]	4.00[a]
Kila 2 + Neem @ 5 tonnes/ha	680.63[b]	608.88[b]	492.50[b]	55.25[b]	4.00[a]
Kila 2 + Siam weed @ 5 tonnes/ha	749.13[b]	698.25[b]	621.63[b]	63.25[a]	4.00[a]

Means with the same letters within columns are not significantly different at 5% level of probability

Effect of Neem and Siam weed on Yield (kg/ha) and Number of yam tubers at Oniyo and Apete Onidoko

At Oniyo, yam yield and tuber number were significantly influenced ($P \leq 0.05$) by the treatments applied. The control recorded the lowest yield (1.99) and tuber number (2.75), indicating poor productivity in the absence of soil amendments. In contrast, TDY/565/02 + neem produced the highest yield (4.15) and tuber number (3.63), demonstrating superior performance among all treatments.

Ewuru + neem also recorded high yield (3.67) and tuber number (2.93), and was statistically comparable to TDY/565/02 + neem ($P \leq 0.05$), indicating no significant difference between both neem-based treatments. TDY/565/02 + siam weed exhibited intermediate performance with yield (2.79) and tuber number (3.00), while Ewuru + siam weed produced lower yield (2.28) but a relatively higher tuber number (3.33) (Table 3a).

At Apete Onidoko, a similar trend was observed, where yam yield and tuber number were significantly influenced by the treatments applied. The control recorded the lowest yield (0.84) and tuber number (2.57). Kila 1 + neem produced a high yield (1.64) and tuber number (3.58), while Kila 2 + neem recorded the highest overall performance with yield (2.29) and tuber number (4.13).

In contrast, Kila 1 + siam weed (1.52, 3.00) and Kila 2 + siam weed (1.53, 3.13) showed intermediate performance in yam yield and tuber number, but were consistently less effective than the neem-based treatments. Overall, neem application significantly enhanced yam productivity compared with siam weed and the control. (Table 3b).

Economic Implications of Neem and Siam Weed on Yam Yield and Tuber Number at Oniyo and Apete Onidoko Villages

Two varieties of yam (Kila 1 and Kila 2) were valued at the market price in Apete Onidoko village, while TDY/565/02 and Ewuru were valued in Oniyo village, respectively. The prices were influenced by the prevailing average prices in markets outside the study areas, such as Omi Ado and Kila markets for Apete Onidoko, and Tewure and Adafile markets for Oniyo villages. As shown in Table 4a, Kila 2, which had the highest market value (₦410 per kg) in Apete Onidoko village, recorded the highest revenue (₦938.90) when treated with neem at 5 tonnes/ha, followed by Kila 2 treated with siam weed (₦627.30). Similarly, Table 4b shows that TDY/565/02, which had the highest market value (₦450 per kg) in Oniyo village, produced the highest revenue (₦1,867.50) when treated with neem at 5 tonnes/ha, followed by Ewuru treated with neem (₦1,468.00). Overall, the market analysis revealed that neem-treated yam varieties generated the highest economic returns in both villages, while siam weed treatment produced higher returns than the untreated control.

Table 2a: Effect of Neem (*Azadirachta indica*) and Siam weed (*Chromolaena odorata*) on vine length (cm) of TDY/565/05 and Ewuru Yam at Oniyo

Treatments	2 WAG	4 WAG	6 WAG	8 WAG	10 WAG	12 WAG	14 WAG	16 WAG	18 WAG
Control	10.75[c]	13.50[c]	32.75[c]	47.00[b]	70.63[b]	70.38[b]	79.25[c]	82.88[c]	88.13[c]
TDY/565/02 + Neem @ 5 tonnes/ha	22.13[a]	32.88[a]	98.50[a]	127.75[a]	146.75[a]	157.75[a]	163.38[a]	177.38[a]	179.38[a]
TDY/565/02 + Siam weed @ 5 tonnes/ha	15.75[b]	18.75[b]	42.25[b]	88.88[b]	100.88[b]	113.50[b]	131.38[b]	141.88[b]	155.88[b]
Ewuru + Neem @ 5 tonnes/ha	17.92[a]	21.67[b]	72.08[a]	79.83[a]	98.58[a]	103.83[a]	149.50[a]	152.25[a]	177.08[a]
Ewuru + Siam weed @ 5 tonnes/ha	14.50[b]	21.75[b]	56.92[b]	95.92[b]	113.58[a]	123.92[a]	133.17[b]	145.17[b]	151.83[b]

Means along the same column with different alphabet are significantly different ($p \leq 0.05$) from each other WAG: Week After Germination

Table 2b: Effect of Neem (*Azadirachta indica*) and Siam weed (*Chromolaena odorata*) on vine length of Kila 1 and Kila 2 Yam at Apete Onidoko

Treatments	2WAG	4WAG	6WAG	8WAG	10WAG	12WAG	14WAG	16WAG	18WAG
Control	6.88[c]	8.38[c]	11.88[b]	17.88[b]	27.13[b]	33.00[b]	43.13[b]	49.36[b]	55.90[b]
Kila 1 + Neem @ 5 tonnes/ha	9.00	11.58[a]	17.67[a]	26.75[a]	36.67[a]	45.08[a]	55.00[a]	65.83[a]	77.75[a]
Kila 1 + Siam weed @ 5 tonnes/ha	7.18[b]	8.82[b]	13.72[b]	17.82[b]	26.18[b]	28.46[b]	42.36[b]	51.88[b]	60.00[b]
Kila 2 + Neem @ 5 tonnes/ha	9.71[a]	12.43[a]	21.14[a]	24.86[a]	37.43[a]	43.43[a]	56.00[a]	66.14[a]	76.86[a]
Kila 2 + Siam weed @ 5 tonnes/ha	8.00[b]	10.25[b]	15.00[b]	22.37[b]	31.12[b]	35.75[b]	48.63[b]	56.88[b]	66.25[b]

Means along the same column with different alphabet are significantly different ($p \leq 0.05$) from each other WAG: Week After Germination

Table 3a: Effect of Neem (*Azadirachta indica*) and Siam weed (*Chromolaena odorata*) on yield and number of yam tubers per/ha at Oniyo

Treatments	Yield (kg/ha)	Number of yam tubers
Control	1.99^{c}	2.75^{b}
TDY/565/02 + Neem @ 5 tonnes/ha	4.15^{a}	3.63^{a}
TDY/565/02 + Siam weed @ 5 tonnes/ha	2.79^{b}	3.00^{ab}
Ewuru + Neem @ 5 tonnes/ha	3.67^{a}	2.93^{a}
Ewuru + Siam weed @ 5 tonnes/ha	2.28^{b}	3.33^{a}

Means along the same column with different alphabet are significantly different ($p \leq 0.05$) from each other**.**

Table 3b: Effect of Neem (*Azadirachta indica*) and Siam weed (*Chromolaena odorata*) on yield and number of yam tubers per/ha at Apete Onidoko

Treatments	Yield (kg/ha)	Number of yam tubers
Control	0.84^{c}	2.57^{b}
Kila 1 + Neem @ 5 tonnes/ha	1.64^{a}	3.58^{a}
Kila 1 + Siam weed @ 5 tonnes/ha	1.52^{a}	3.00^{b}
Kila 2 + Neem @ 5 tonnes/ha	2.29^{a}	4.13^{a}
Kila 2 + Siam weed @ 5 tonnes/ha	1.53^{b}	3.13^{b}

Means along the same column with different alphabet are significantly different ($p \leq 0.05$) from each other**.**

Table 4a: Economic Implications of Neem (*Azadirachta indica*) and Siam weed (*Chromolaena odorata*) on Yam Yield and Tuber Number at Apete Onidoko Village

Treatments	Number of Yam	Yield (kg/ha)	Price /kg (₦)	Revenue (₦)
Control	3	0.84	385	323.40
Kila 1 + Neem @ 5 tonnes/ha	4	1.64	385	631.40
Kila 1 + Siam weed @ 5 tonnes/ha	3	1.52	385	585.20
Kila 2 + Neem @ 5 tonnes/ha	4	2.29	410	938.90
Kila 2 + Siam weed @ 5 tonnes/ha	3	1.53	410	627.30

Means along the same column with different alphabet are significantly different ($p \leq 0.05$) from each other**.**

Table 4b: Economic Implications of Neem (*Azadirachta indica*) and Siam weed (*Chromolaena odorata*) on Yam Yield and Tuber Number at Oniyo village.

Treatments	Number of Yam	Yield (kg/ha)	Price /kg (₦)	Revenue (₦)
Control	3	1.99	420	835.80
TDY/565/02 + Neem @ 5 tonnes/ha	4	4.15	450	1,867.50
TDY/565/02 + Siam weed @ 5 tonnes/ha	3	2.79	450	1,255.50
Ewuru + Neem @ 5 tonnes/ha	3	3.67	400	1,468.00
Ewuru + Siam weed @ 5 tonnes/ha	3	2.28	400	912.00

Means along the same column with different alphabet are significantly different ($p \leq 0.05$) from each other**.**

Several plants play a crucial role in controlling nematode damage in crops by producing organic compounds with nematicidal (killing) and nemastatic (inhibiting) properties that are toxic to nematodes. This study targeted these botanicals for effective reduction of plant-parasitic nematodes. The findings revealed that the plant extracts significantly contributed to the management of plant-parasitic nematodes. Neem (*Azadirachta indica*) and Siam weed (*Chromolaena odorata*), applied at 5 tonnes\ha reduced nematode populations in yam tubers more effectively than the untreated control. This suggests that these treatments may have lowered the nematodes survival and reproduction rates. These findings align with that of Jusu *et al*. (2024), who reported that neem (*Azadirachta indica*), Siam weed (*Chromolaena odorata*), and African marigold (*Tagetes erecta*) effectively suppressed nematode infestations in tomatoes.

The study also found that while neem and siam weed reduced *Scutellonema bradys*, *Pratylenchus* sp. and *Meloidogyne* sp. populations their effects on *Pratylenchus* sp. and *Meloidogyne* sp. were not significantly different. Nonetheless, applying these botanicals at 5 tonnes/ha appeared sufficient to maximize yam tuber yield across both study locations. This observation supports the findings of Kwodaga *et al*. (2019), who reported that plant extracts contain substances that promote crop yields. Moreover, both botanicals improved vine length and tuber yields compared to the control, indicating their potential as effective and sustainable options for farmers managing nematode infestations in yam crops. Nyong and Nworgu (2023) reported similar efficacy using siam weed leaves to control nematodes in tomatoes. Mensah *et al*. (2002) also observed that neem seed extracts outperformed other botanicals in reducing nematode populations. This study also found that neem at 5 tonnes/ha was more effective than siam weed at the same rate in reducing nematode numbers. This suggests that both Neem and Siam weed, applied at the 5 tonnes/hectares are effective for suppressing nematodes and enhancing yam yield. However, areas with high nematode infestations may experience reduced yield quality if nematodes are not adequately controlled before and during cultivation. Overall, the use of botanicals offers a promising strategy for managing plant-parasitic nematodes in root and tuber crops, ensuring better yields and sustainable agricultural practices.

Conclusion and Recommendation

This study has revealed that the neem (*Azadirachta indica*) and siam weed (*Chromolaena odorata*) at 5 tonnes/ha effectively managed plant parasitic nematodes of yam. Application of neem (*Azadirachta indica*) increased the response of yam tuber yield more than siam weed (*Chromolaena odorata*) at 5 tonnes/ha. The study would introduce to the farmers the nematostatic potential of plant extract employed while yam growers on the other hand would have a cheaper and environmentally safe option for managing plant-parasitic nematodes.

It is recommended that yam growers adopt the application of neem (*Azadirachta indica*) and siam weed (*Chromolaena odorata*) at 5 tonnes/ha as an effective, affordable, and environmentally sustainable strategy for managing plant-parasitic nematodes, enhancing yam tuber yield and improving overall productivity.

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