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The Diversity of Oil Palm Weeds Results in The People's Oil Palm Plantations in Kuantan Singingi Regency

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ABSTRACT

Weeds are defined as plants that have the potential to disrupt or harm human interests, and as a result, humans have developed methods to control their proliferation. The weeds in oil palm plantations exhibit considerable diversity, encompassing grasses, sedges, and woody plants. This research aims to ascertain the diversity of weed species present in mature oil palm plantations in the Kuantan Singing District. The research was conducted using the proposed random sampling method. Data were collected through direct interviews, which included information such as the age of the plant and the type of herbicide and fertilizer used. The weed vegetation was analysed using the quadrant method on each plot of land. The observation plots were 10 m x 10 m in size, with 25 plots in each garden. The weeds are identified at each observation point through a visual examination of their morphological characteristics, which are then matched with those described in the relevant literature. The observations of plantation conditions indicate that the predominant age of the oil palm is 5-7 years, with a planting distance of 8x9 metres. The soil types observed in each plantation area included black sandy, white sandy, and rocky, with black sandy soil representing the dominant soil type. Farmers employ both mechanical and chemical techniques to control weeds. The frequency of control is once every three months. A total of 14, 12, and 9 weed species were identified in the Central Kuantan, Inuman, and Sintajo Raya sub-districts, respectively. The results of the observation of the types of weeds found in the people's coconut plantations on yield crops revealed the presence of five types of narrow-leaf weeds, ten types of broad-leaf weeds, and four types of fern weeds.

Keywords: Kuantan Singingi Regency, Palm Oil, People's Plantations, Weeds

1. INTRODUCTION

Wild plants frequently proliferate as invasive species, competing with cultivated plants and becoming weeds in cultivated land. One such species is the oil palm. Oil palm plants are a primary commodity in the Kuantan Singingi district, playing a significant role in the local economy. The capacity of oil palm plants to produce vegetable oil is a requisite for the industrial sector, as it facilitates the enhancement of human well-being. The total area of oil palm plantations is 235,629.93 hectares, with a total production of 405,793.10. The considerable expansion of the oil palm industry in Kuantan Singingi district is a favourable development that warrants continued support and enhancement. The maintenance and enhancement of oil palm production are inextricably linked with the issue of weed interference. Weeds are defined as wild plants that grow in proximity to oil palm plants, including within the area of the trellis plate and the market. Weeds are defined as plants that interfere with or harm human interests, prompting humans to attempt their control. The flora of oil palm plantations is highly diverse, encompassing a wide range of species, including grasses, sedges, and woody plants. The composition of the plantation land also influences the types of weeds that flourish. In peat land, the weed population is predominantly composed of broad-leaved species and ferns, whereas in mineral soil, it is primarily represented by broad-leaved sugar and grass. The majority of oil palm plantations in the Kuantan Singing District are situated on mineral land. A total of 26 weed species have been identified in oil palm plantations in Petai village, Kuantan Singing District. Of these, 12 are classified as immature plants and 14 as productive plants. The control of weeds on oil palm plantations is typically achieved through the use of herbicides. The continuous use of herbicides is considered ineffective due to its detrimental impact on the environment and the high cost associated with it.

2. RESEARCH METHOD

2.1. Selecting Research Site

The research was conducted on 6 areas of smallholder oil palm plantations in the districts of Inuman, Sintajo Raya, and Kuantan Tengah, with 2 areas selected from each district. These smallholder plantations have a land area ranging from 2 to 3 hectares and are 5 to 7 years old, with a planting distance of 8x9 meters.

2.2 Weed Vegetation Analysis

A quadrant method was employed to analyse the weed vegetation in each plot of land. An observation plot measuring 10 m x 10 m was established, and a sub-observation plot measuring 1 m x 1 m was created within this plot. These sub-observation plots were placed systematically, with a diagonal line marked using a plastic rope. A total of 25 plots were established within each garden. The weed vegetation analysis results yielded data on the specific types, quantities, and densities of weeds present. The data are presented in tabular form.

2.3 Weed Identification

Identification of weeds found at each observation point was carried out by visually observing the morphological form of the weeds, then matching them with the literature.

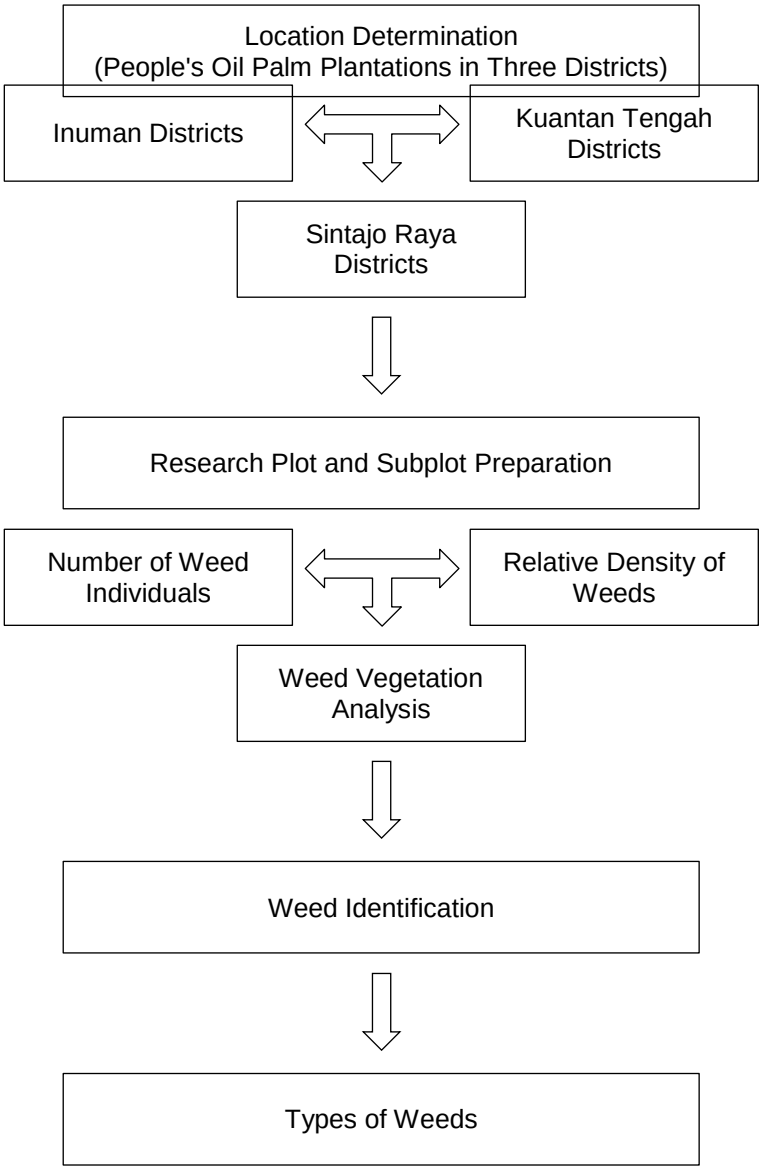

Figure 1. Research Flow Diagram

3. RESULT AND DISCUSSION

3.1 Description of Research Site

The location of this research consists of 6 areas of smallholder oil palm plantations, with two farmers selected from each sub-district. The oil palm plants are between 5 to 7 years old, with a planting distance of 8x9 meters. The soil types in each plantation area include sandy black soil, sandy white soil, and rocky soil, with sandy black soil being the most dominant. Weed control conducted by the farmers employs both mechanical and chemical control techniques. Mechanical control is carried out using a brush cutter, while chemical control utilizes herbicides. The farmers use the herbicide type Gromoxone with a control frequency of once every three months.

3.2 Number of Weed

The results of weed observations on the people's oil palm plantation land in Kuantan Tengah sub-district found 14 types of weeds, Inuman sub-district found 12 types of weeds and Sintajo Raya sub-district found 9 types of weeds. (Table 1).

Observation results of the types of weeds found in people's coconut plantations on productive plants found 5 types of narrow-leaf weeds, 10 types of broad-leaf weeds and 4 types of fern weeds.

Table 1. Number of Weed

Kuantan Tengah			Inuman			Sintajo Raya		
Weed Name	Qty.	KR	Weed Name	Qty.	KR	Weed Name	Qty.	KR
Melastoma Malabatrchum	104	0,59	*Melastoma Malabatrchum*	335	2,071	*Melastoma Malabatrchum*	554	0,59
Clidemia Hirta	12	1,19	*Clidemia Hirta*	158	*0,80*	*Clidemia Hirta*	374	1,1
Borreria leavis	63	0,519	*Borreria leavis*	260	*1,21*	*Borreria leavis*	398	0,35
Paspalum conjugatum	396	1,644	*Paspalum conjugatum*	454	*0,73*	*Paspalum conjugatum*	1795	1,21
Ottochloa nodosa	198	1,921	*Ottochloa nodosa*	86	*2,57*	*Ottochloa nodosa*	304	0,1
Cyperus iria	57	0,39	*Cyperus iria*	85	*0,27*	*Cyperus kylinga*	491	0,4
Davillia denticulata	15	*0,02*	*Davillia denticulata*	76	*0,71*	*Mimosa pudica*	106	0,159
Ageretum conyzaides	66	0,16	*Ageretum conyzaides*	213	*1,39*			
Choromoleana odorata	12	0,09	*Mikania micranta*	16	*0,16*	*Choromoleana odorata*	434	0,54
Imperata cylindrica	16	*0,02*	*Nephrolepis biserrata*	26	0,18	*Imperata cyllindrica*	375	0,14
Calopogonium Mucunoides	41	*0,15*	*Microsorum scolopendria*	199	0,27			
Ttyphonium blumei	20	*0,08*	*Dicranopteris linearis*	24	0,05			
Asystasia gangetica	276	1,196						
Borreria latifolia	90	*0,44*						

The *Paspalum conjugatum* species is a narrow-leaf weed that is most commonly found in people's oil palm plantations observed in three sub-districts in Kuantan singing. According to Harahap 2008 *Paspalum conjugatum* is a common weed that is dominant in plantations, this weed grows in both lowlands and highlands and can also survive in both shaded and unshaded conditions. The spread of this weed is very fast because it can grow with seeds and easily reproduce using stolons (Wisdawati et al 2022). Conditions like this cause the Paspalum conjugatum population to be found a lot on oil palm plantations because it can grow in any conditions and has a generative and vegetative reproduction system. The reproduction of weeds both generatively and vegetatively causes the weed population to be found more.

Dicranopteris linearis is the least weed with a total relative density of 0.05% and is only found in Inuman sub-district. According to Wijayanto et al 2019 *Dicranopteris linearis* is found in areas with a soil pH close to acidic, namely 5-6, air humidity 78%, soil humidity 60% with soil conditions widely covered with litter. This is in line with the condition of the garden in Inuman sub-district where Dicranopteris linearis was found, the plantation land is located in a slightly swampy area with lots of litter covering the soil in the plantation area.

The most common broadleaf weed is the *Melastoma malabatrchum* species. *M. malabathricum* is a shrub with woody and branching stems with reddish purple flowers clustered at the tips of brownish green flower algae leaves. According to Madusari, 2016 Melastoma malabathricum is classified as a dangerous and invasive weed, one of the weeds that is quite dominant in plantation areas. The M. malabathricum weed is a weed that grows and reproduces quite

quickly because it can produce many seeds to reproduce.

3.3. Identiying Weed

3.3.1. *Melastoma malabatrchum*

M. malabathricum is a shrub with woody and branched stems with reddish-purple flowers clustered at the ends of brownish-green flower algae leaves. Pinnate leaf veins on the leaf surface have three clear leaf bones and extend straight above the leaf tip. The brown coloured fruit is round like a flower vase, the ripe fruit will break into cracks and be divided into several parts. According to tjitrosoepomo (2013) the fruit of M. malabathricum tastes sweet and can be eaten.

Figure 2. *Melastoma malabathricum* Source (left) Tjitrosoepomo (2013) (right) Research Documentation

3.3.2. *Chromoleana odorata*

Chromoleana odorata is a shrub plant of the asteraceraea group that has a woody stem overgrown with fine hair, the leaves are oval-shaped the wider the bottom and the more to the end the more tapering the arrangement of the leaves face to face. According to Soeryako 2011 Chromoleana odorata has white flowers in clusters and locks during the dry season. Prawiradiputra 2007, states that *Chromoleana odorata* plant wreaths are located at the end of the cabag. Each wreath consists of 20-35.

Figure 3. *Chromolaena odorata* (Kirinyuh) Source (left) https://ccrc.farmasi.ugm.ac.id (right) Research Documentation

3.3.3. *Mimosa pudica*

Mimosa pudica is a shrub with a woody stem that is round and spiny, with pinnate and flat-edged leaves with a green, hairy leaf surface. Mimosa pudica roots have a taproot system. Mimosa

pudica has a distinctive feature, namely the response of folding leaves when it gets a touch stimulus.

Figure 4. *Mimosa pudica* Source (left) Dalimartha 2008 (right) Research Documentation

According to Dalimartha 2008, the diameter of mimosa roots ranges from 1-5 mm and has a distinctive odour that resembles the smell of jengkol. Young stems of mimosa pudica are strikingly green and old stems are red. Flowers are pink with a round shape, stout spines, small petals and have pink corolla leaves. Flowers on this plant are composed of 4 lobes with a total of 4 seeds and have a large number of ovules (Ahmad, 2011). The flowers of the putri malu plant (Mimosa Pudica Linn) grow between the petioles, are round, and pink in colour (Joseph et al., 2013).

3.3.4. *Clidemia hirta*

Clidemia hirta is a branched shrub with woody stems that are erect with a few brown scales having single oval-shaped leaves covered with hairs or flat leaf edge hairs. Clidemia hirta L flowers are located at the ends of white stems and include compound flowers.

Figure 5. *Clidemia hirta* Source (left) Sandoval and Rodriguez 2014 (right) Research documentation

According to Sandoval and Rodriguez 2014, the lower surface of *Clidemia hirta* leaves has many hairs compared to the upper surface of the leaves with reddish brown leaf hairs. *Clidemia hirta* has true fruit. This fruit contains compound berries. The fruit is also covered with hard hairs that spread across the surface of the fruit, especially

when it is young. Young fruit is green and old fruit is black-purple.

3.3.5. *Borreria laevis*

Borreria laevis belongs to the Rubiaceae family which has the characteristics of a square-shaped stem with fine hairs, the stem grows upright and is purple in color. The leaves are opposite, oval in shape, the leaf edges are flat, the leaf base is blunt and the leaf tips are pointed, the leaves are green with purple leaf edges. Has bell-like flowers that grow in the leaf axils.

Figure 6. *Borreria laevis* Source (left) Tanasale, et al 2023 (right) Research documentation

The stem is purple in colour, rectangular in shape with smooth haired sides. The leaves grow opposite ovate in shape, measuring 2.5-5.5 cm x 0.75-2 cm, the base of the leaf is blunt, the tip of the leaf is pointed, the edge of the leaf is flat, the upper surface is hairy dark green, the root system is taproot, has many root branches, with real leaf veins. The flowers have two smooth-haired petals, a bell-shaped corolla measuring 3-3.75 mm with 4 white corolla leaves with a purple pattern at the tip, small flower heads, growing points in the leaf axils and at the ends of the stems measuring 12 mm. Fruit oval, split longitudinally or longitudinally into two hemispheres, hairless on top, persistent partition or septum clearly visible, measuring approximately 1 mm (Tanasale, et al 2023)

3.3.6. *Borreria latifolia* L.

Borreria latifolia is a herbaceous plant with a taproot system.

Figure 7. *Borreria latifolia* L (Potato) Source (left) Herlinda (2018) (right) Research Documentation

The stem of Borreria latifolia is rectangular, single leaves, opposite leaves, oval, pointed leaf tips, pointed leaf bases, flat leaf edges, thin leaf flesh, penninervis pinnate leaf veins, green leaf color. According to Widhyastini el al 2012 *Borreria latifolia* has morphological characteristics, namely having a taproot with many branches. The stem grows in rows, square, segmented with fine green hairs, monopodial branching. The stem grows upright or creeping which can reach a height of 15-75 cm, the flowers are light green. Flowers are located in the leaf axils, oval forming clusters of seeds found in flower clusters, finely hairy. Leaves are oval, the tip and base of the leaf are blunt, the leaf veins are pinnate, the leaf edges are flat, the leaf stalks are short, green, there are fine hairs.

3.3.7. *Ageratum conyzoides*

Ageratum conyzoides is a shrub with a taproot system, 26-29.4 cm tall. The stem is round with fine hairs, purplish green in colour. Single leaf position opposite, ovoid leaf shape, tapered leaf tip with serrated leaf edges and pinnate leaf reinforcement, leaf surface downy, green leaves. Babadotan flowers are in the leaf axils fused into a bouquet with a bell-shaped crown with white or purple colour.

Figure 8. *Ageratum conyzoides* (Babadotan) Source (left) Dalimartha, 2006 (right) Research Documentation

Ageratum conyzoides is a plant with a taproot that grows upright with a height of 26-29.4 cm. Round stem shape with fine hairs, purplish green in colour. Single leaf, sitting opposite, ovate ovate leaf shape, acuminate tapered leaf tip, serrated serrated leaf edge, pinnate penninervate leaf reinforcement, pinnate penninervate leaf base, papyraceous thin leaf flesh, downy leaf surface, green leaves with leaf width 3.1-4.3 cm and leaf length 4.7-5.5 cm. (Dalimartha, 2006). Babadotan flowers are located in the leaf axils (axillary), the bumps merge into a wreath with a length of 6-8 mm with hairy stalks, hairy petals, bell-shaped crown with white or purple colour. Flowers are compound flowers that gather more than 3 flowers.

3.3.8. *Imperata cylindrica*

Imperata cylindrica belongs to the Poaceae family, which has a taproot, has many roots, the main root is white. The stem including the grass stem, grows upright, covered with leaves, is round and has a smooth surface. The leaves are oblong, including single leaves, grow from the stem layer, the tip of the leaf is pointed, the edge of the leaf is sharp, the surface of the leaf is rather rough.

Imperata cylindrica is an upright plant with a height of about 30-150 cm, branched roots are in the soil with a depth of more than 50 cm. Flowers are in the form of white grains with a length of 5-20 cm with a diameter of 2.5 cm. Seeds are oval, brown with a length of 1-1.5 mm (Hidayat & Rachmadiyanto 2017).

Fibrous roots with a diameter of 2.2 mm, uneven surface, wrinkled, brownish yellow, unclear taste and smell (Jayalakshmi et al. 2010).

Figure 9. *Imperata cylindrica* Source (left) Jayalakshmi et al 2010 Right Research documentation

3.3.9. *Paspalum conjugatum*

Paspalum conjugatum grows creeping stems that form roots and new shoots at each node, have parallel leaf shapes, pointed tips, flat edges, parallel leaf veins, fine hairs, sheaths, scattered leaves, green in color. Flowers at the end of the stem, have two panicles, composed of lanceolate-shaped grains, which are attached along the panicle, fine hairs, greenish white in color. Taproot, with many branches and root hairs, brownish in color.

Figure 10. *Paspalum conjugatum* Source (left) yolla et al 2022 (right) Personal Documentation

Paspalum conjugatum has a cylindrical stem, calmus, smooth, purplish in color, sympodial stem whose nodes form new roots and shoots and generally each shoot produces flowers. The stem partly grows upright with a height of 30-100 cm, has many leaves, round shape, hairless. Flowers are panicles with branches "panicle" that resemble barbed wire, purple in color therefore this grass is often called wire grass. The length of the panicle branch is 2.5-25 cm and grows in all directions. Many seeds are small. Reproduces by seeds and stolons that spread very quickly so that it is a competitor in the use of nutrients and

growing space (Prawirosukarto et al., 2005)

3.3.10. *Asystasia gengetica*

Asystasia gengetica is a soft-stemmed herbaceous plant, brownish green in color and can grow in less than ideal conditions. The leaves grow opposite each other, are oval in shape, with a rounded leaf base, pointed tip, pinnate leaf veins and stalks and there are a few fine hairs on the leaves. The flowers are white with purple stripes on the petals. The taproot system, has small branches, has root hairs and is brownish white in color.


Figure 11. *Asystasia gangetica* Source (left) Moenandir, 2006 (right) Research Documentation

According to Moenandir, 2006. *Asystasia gengetica* is a herbaceous plant that grows quickly and is easy to reproduce. It has a soft stem, brownish green in color, the stem is soft so that the stem is easily broken if touched. The leaves are opposite, oval in shape, rounded at the base, pointed at the tip. The taproot system, has small branches, has root hairs and is brownish white in color. The flowers are white with purple mosaics on the petals and the flowers are arranged in dense bunches like grains (Elliot et al., 2004). The fruit is a box, 2-3 cm long, in one box there are four or less seeds. When the fruit is not ripe, the skin of the fruit is green, but when the fruit is ripe, the skin of the fruit is brown

3.3.11. *Ottochloa nodosa*

Ottochloa nodosa is included in the group of grass weeds which grow in spreading and intertwining forms in sheets.


Figure 12. *Ottochloa nodosa* source (left) Mawandha et al., 2022 (right) research documentation

The stem of this weed has segments and nodes, each node is capable of producing new roots and shoots and producing flowers. The leaves are oval, linear, long and tapered. This weed produces small seeds. According to Mawandha et al., 2022 Ottochloa nodosa is included in the group of grass weeds that have widespread distribution and rapid growth. This weed has morphological characteristics of lanceolate, linear, long and tapered leaves. The height of the wire stem can reach 30-120 cm which is composed of internodes and nodes. Each node can produce roots, new shoots and flowers. Wire flowers are purple and panicle-shaped with a panicle length of 2-25 cm (Fauzi et al., 2023). The seeds produced by wire weeds are numerous and small in size, so they are easily spread by the wind (Mawandha et al., 2022).

3.3.12. *Nephrolepis biserrata*

Nephrolepis biserrata is a group of ferns that have light brown fibrous roots and upright rhizome stems, covered in brown hair.

Figure 13. *Nephrolepis biserrata* source (left) yolla et al 2022 (right) Personal Documentation

The stems are round, slender and elongated, with brownish green hair, the leaves are arranged in alternating pinnate compounds, the shape of the leaves is elongated with serrated leaf edges, the surface is smooth, the leaf tips are pointed and the base of the leaves is hollow.Romaidi et al., 2012 stated that the morphology of Nephrolepis biserrata leaves is relatively thin, the leaf surface area is wider, the number of leaves is large, which is the characteristic of this plant. Long fibrous roots, rhizome stems with surfaces covered by hair. Flat, rectangular leaf stalks with hairy surfaces. Young leaves are light green with rolled tips. Compound leaves, pinnate, elongated leaf shape, serrated edges, pointed tips and bases. The leaf surface is hairy, the width of the largest leaf is about 0.6 cm and the length of the largest leaf is about 2 cm. Round or line-shaped sori can be found on the lower surface of the leaf which are arranged parallel to the edge (Tjitrosoepomo, 2014). *Nephrolepis biserrata leaf* stalks are soft scaly, the scales are brown. The leaf surface is rough with a fertile leaf shape larger than sterile leaves, fertile leaves are pointed. The spores are evenly distributed along the edge of the leaf. The stem is round, slender and elongated, brown in color. The roots are fibrous and black in color so that the growth of this weed can prevent erosion (Romaidi et al., 2012).

3.3.13. *Dicranopteris linearis*

Dicranopteris linearis is a land plant that grows upright and has fibrous rhizome roots and a clear stem. The surface of the stem is hairy and brownish in color. The leaves are compound

pinnate, the shape of the leaves is elongated, with flat leaf edges, smooth surfaces, pointed leaf tips and flat leaf bases. grows upright with a plant height of about 60 cm.

Figure 14. *Dicranopteris linearis* source (left) yolla et al 2022 (Right) Personal Documentation

Dicranopteris linearis has brown fibrous roots with long rhizome segments. The stem is round, upright, and brownish yellow. The branching of the stem is pseudodichotomous. The last branch has many leaves arranged in pairs. The leaves are dark green with small pinnae and are arranged closely together and opposite each other. Young leaves that are still rolled up are light green and are generally covered with fine white hairs. The lowest pair of pinnae is usually located at the branching of the stem and is smaller than the previous pair of pinnae. The pinnae have blunt tips, flat basal, and flat edges. Sporangia are located on the abaxial part of the yellow fertile leaves and are irregularly distributed.

3.3.14. *Kyllinga brevifolia*

Kyllinga brevifolia has morphological characteristics, namely *K. brevifolia* or jukut pendul is included in the Cyperaceae family and is an annual plant that grows in tropical areas. *K. brevifolia* has fairly large fibrous roots without many branches. The stem is grass-like, the surface of the stem is flat, smooth, and grows creeping. The leaves are green, lanceolate, and grow on the stem layer. The seeds are large and round.

Figure 15. *Kyllinga brevifolia* source (left) yolla et al 2022 (Right) Personal Documentation

3.3.15. *Typhonium blumei*

Typhonium blumei is a herbaceous plant similar to taro that has oval leaves with pointed heart-shaped tips. One plant has 3 leaves with wide tips, the upper and lower leaf surfaces are flat with a green color. This plant has white tubers with a round shape and has sap.

Figure 16. *Typhonium blumei* source (left) Heng and Hetterscheid 2010 (Right) Personal Documentation

According to Heng, L., and Hetterscheid 2010 *Typhonium blumei* is a herbaceous plant with a height of 25-30 cm. In one individual generally has 3-4 oval leaves with both ends widening to form an arrow. The color of the leaves is light green and as they get older the color of the leaves changes to dark green. The leaf stalks are green measuring 15-30 cm and the base of the stem is in the soil while the tubers are round and flat as big as nutmeg.

3.3.16. *Calopogonium mucunoides*

Calopogonium mucunoides is a plant with fibrous roots that branch out and has a round stem that twists at the part of the stem that produces roots.

Figure 17. *Calopogonium mucunoides* Source (From) Research Documentation Source (Right) https://tropicalforages.info/text/entities/calopogonium_mucunoides.htm

The stem is light green, the surface of the stem is hairy. The leaves are oval with blunt leaf tips, flat leaf edges, pinnate leaf veins, the surface of the leaves is finely hairy. The growth of the leaves is opposite each other and the color of the leaves is green. Calopogonium mucunoides has root

nodules.According to Tosang 2019 *Calopogonium mucunoides* is a shrub with a taproot system. The shape of the stem is long and creeping and covered with fine brown hairs, single leaves sit opposite leaves, three leaf blades, round ovate leaf structure, obtuse leaf tips, flat leaf edges, integer, penninervis pinnate leaf veins, blunt leaf base, thin leaf flesh like papyraceus paper, the leaf surface is finely hairy with a golden brown color, the leaves are green and have elongated green hairy pods, leaf width 2.4-5.4 cm and leaf length 3.4-6.9 cm. Butterfly-shaped flowers and pod-shaped fruit

3.3.17. *Davallia denticulata*

Davallia denticulata Kuhn Fibrous roots, rhizome stems with the surface of the rhizome covered with brown hairs. Round leaf stalks with smooth surfaces. Young leaves are light green with rolled tips, compound leaves, double pinnate veins, triangular leaf shape, serrated edges, pointed tips and bases.

Figure 18. *Davallia denticulata* Source (Left) Research Documentation (Right) https://uforest.org/plants/species?q=Davallia_denticulata

The leaf surface is smooth, the largest leaf width is about 3 cm and the largest leaf length is about 4.3 cm. Sori are round to elongated which can be found on the lower surface of the leaf along the leaf edge and are arranged separately (Tjitrosoepomo, 2014).

3.3.18. *Mikania micrantha*

Mikania micrantha is a climbing shrub. Its heart-shaped leaves are arranged opposite each other.

Figure 19. *Mikania micrantha* Source (left) https://www.flickr.com/photos/jackforest (Right) Research Documentation

The leaves are arranged opposite each other, heart-shaped with pointed tips; wavy leaf edges, finely hairy surface, leaves grow on stem segments. *Mikania micrantha* has small, whitish flowers, clustered at the ends of branches or leaf axils. The stem of *Mikania micrantha* is light green, hairy, grows creeping, has many branches.

Mikania micrantha is a herbaceous plant that exhibits a creeping or twining growth habit, displaying a profusion of branches. The leaves are heart-shaped and arranged in a opposing pattern, with relatively long stems. The leaves are arranged in a opposite pattern and are oval to oval-triangular in shape. The base of the leaf is deeply divided and thin, while the tip tapers. The leaf margins are coarsely or shallowly toothed, wavy or flat. Both surfaces are covered in fine hairs. The plant produces flowers measuring 4.5 to 6 mm in length and in considerable quantity. The flowers are small and pale pink in colour, forming clusters at the ends of the branches or in the leaf axils. The plant exhibits a stem that grows in a light green hue and displays branching characteristics. It is covered with fine hairs. The stem can reach a length of between three and six metres. Each segment is characterised by the presence of two leaves positioned in opposition to one another, along with new shoots and flowers. The surface of the leaf is bowl-like in shape and exhibits serrated edges. The seeds are produced in large quantities and are blackish brown in colour, measuring 2mm in length. This plant is classified as a convoluted liana (Deddy, 2013). Haryanto (2016) observed that the stem of *Mikania micrantha* is light green, hairy, creeping, and possesses numerous branches, with a potential length of 3-6 m. This plant is identified as a broad-leaf weed with triangular leaves (cordate) with pointed tips and serrated edges, arranged in a position facing each other on the stem segments. The flowers of Mikania micrantha are white and grow from the axils of leaves or the tips of shoots. They are small flowers, measuring 4.5-6 mm in length. Mikania micrantha produces a large number of seeds, which are blackish brown in colour and 2 mm in length.

4. CONCLUSION

The findings of the observations conducted on the plantation conditions indicate that the majority of the oil palm plants are between the ages of 5 and 7 years, with a planting distance of 8x9 metres. The soil types observed in each plantation area included black sand, white sand, and rocky soil with a predominantly black sand composition. Weed control is conducted by farmers through the utilisation of both mechanical and chemical control techniques. The frequency of control is performed on a quarterly basis, with each instance occurring every three months. A total of 14, 12, and 9 weed species were identified in the smallholder oil palm plantations of Kuantan Tengah, Inuman, and Sintajo Raya districts, respectively. The results of the observation of the types of weeds found on smallholder coconut plantations revealed the presence of five types of narrow-leafed weeds, ten types of broad-leafed weeds, and four types of fern weeds.

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