

Identification of Weeds in Horticultural Plant Cultivation Land in West Tarakan

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ABSTRACT

Weeds are plants that cause losses in plant cultivation activities, to determine the type of weed species weed identification is carried out. Identification in this study aims to determine the types of weed species that grow and the dominant types of weed species growing on horticultural crop cultivation land in West Tarakan District. This research was carried out in the cultivation of horticultural crops in West Tarakan District. The sampling method is by random method using the squared plot method with a size of 1 x 1 m as many as 50 samples. The results showed that there were 38 types of weeds found in the cultivation of horticultural crops in West Tarakan District, namely *Ageratum conyzoides*, *Alternanthera sessilis*, *Amaranthus spinosus*, *Asystasia gangetica*, *Borreria alata*, *Cleome rutidosperma*, *Coleus rotundifolius*, *Commelina nudiflora*, *Cyathium cinereum*, *Drymaria cordata*, *Eclipta prostrata*, *Euphorbia hirta*, *Hedyotis corymbosa*, *Leucas martinicensis*, *Lindernia ciliata*, *Lindernia crustacea*, *Ludwigia parviflora*, *Peperomia pellucida*, *Phyllanthus urinaria*, *Physalis angulata*, *Portulaca oleraceae*, *Scoparia dulcis*, *Spermacoce exilis*, *Tithonia diversifolia*, *Andropogon aciculatus*, *Axonopus compressus*, *Digitaria sanguinalis*, *Echinochloa colona*, *Eleusine indica*, *Juncus effusus*, *Lophatherum gracile*, *Paspalum conjugatum*, *Tradescantia spathacea*, *Urena lobata*, *Cyperus compressus*, *Cyperus iria*, *Fimbristylis miliacea*, *Kyllinga brevifolia*. 24 types of broadleaf weeds, 10 types of grasses, and 4 types of sedges. Weeds The dominant weed species in Horticultural crop cultivation land in West Tarakan District is *Eleusine indica* with a Summed Dominance Ratio of 13.28%.

Keywords:

Horticulture, Weed,
West Tarakan

INTRODUCTION

West Tarakan is one of the sub-districts in Tarakan City with an area of around 27.89 km² [1]. One

of the land uses in West Tarakan is used as a land for cultivating horticultural crops in the form of vegetables. In vegetable cultivation activities, there was a decrease

in production yields on mustard greens and kale from 2015 to 2017 [2].

The decrease in production yields in the cultivation of horticultural crops is caused by the attack of plant-disturbing organisms, namely weeds. Weeds are unwanted plants because they can compete with cultivated plants in fighting for the same necessities of life. Weeds also cause other losses because they have allelopathic compounds that can restrain the growth of cultivated plants [3].

Based on the results of research [4] in Kepahiang District, Bengkulu Province, weed identification and dominance were carried out on upland dry land to obtain 30 weed species from 14 scattered families. The identified weeds included broadleaf weeds (20 species), grasses (8 species), and sedges (2 species).

The results of identification of weeds for North Tarakan horticultural crops yielded the highest SDR value, namely *Eleusine indica* weed of 18.92% [5]. That the results of identification of weeds on pepper plants in Berau Regency, North Kalimantan yielded SDR values the highest was *Ageratum Conizoides* weed with 28.10% [6].

Weeds that are commonly found are broad-leaved groups from the order Dicotyleae which grow with a large habitus, so that competition for light occurs with plants [7]. Weeds can be detrimental to plants, but on the other hand, efforts can be made to seek benefits as an effort to replace expensive control costs [8]. Therefore, identification of weeds is needed to find out, explore and or seek the possible benefits of weeds. So it is necessary to do research with the title Identification of Weeds on Horticultural Plant Cultivation Land in West Tarakan.

METHOD

The research was conducted on horticultural crop cultivation land in West Tarakan District, Tarakan City, North Kalimantan Province. Tools and materials used include machetes, raffia rope, scissors, wooden pegs, stationery, label paper, meter, pH meter, road board, and plastic bags

The research procedure included conducting a preliminary survey to all areas in West Tarakan in order to obtain data on farmer groups, then to collect data on farmer groups who cultivate horticultural crops in the form of vegetables directly in the field. Then conduct interviews based on questionnaires that have been prepared directly. Next, make square plots measuring 1 × 1 m from pegs and raffia. Then carry out an analysis of weed identification taken from horticultural crop cultivation land in West Tarakan. Weed identification data of 50 samples were taken randomly and could represent each field. Before carrying out the identification, first determine the area to be observed in the area of horticultural crop cultivation in West Tarakan, then determine the area to place square plots and record coordinate points on each plot that has been determined using GPS. In addition to determining the coordinates, soil pH was also checked using a pH meter. Then place the square grid in the specified area.

For each group of squared plots, weed data were identified based on the name of the species and the calculation of the number of species. The square plot taken is the square plot with the densest weed density. The parameters of this study were to count the number of weed species and the names of the weed species identified. The data obtained in the field is then processed to determine the level of density, frequency, significance and SDR value.

RESULT AND DISCUSSION

West Tarakan is located at 117°34' 56" E on East Longitude and 3° 18' 49" N on North Latitude which includes lowlands with an altitude of ± 28.00 masl. West Tarakan is bordered by North Tarakan District (north side), Central Tarakan District (west side), Bulungan Coastal District (east and south side). West Tarakan has a total area of 46.35 km² with a land area of 27.89 km² and an ocean area of 18.46 km². West Tarakan consists of 5 Sub-districts including Karang Rejo Village with an area of 0.70 km², Karang Balik Village with an area of 0.65 km², Karang Anyar Village with an area of 6.30 km², Karang Harapan Village with

an area of 12.31 km², and Karang Anyar Pantai Village with an area area of 8.93 km² (BPS, 2019). In this area, each kelurahan area is used in the residential development sector, building public facilities or transportation and agricultural facilities including protected forest areas and or urban forests. The population density in West Tarakan is around 3,178 people/km² and the total population reaches 88,642 thousand. The population growth rate in West Tarakan reaches 3.4% per year [9]

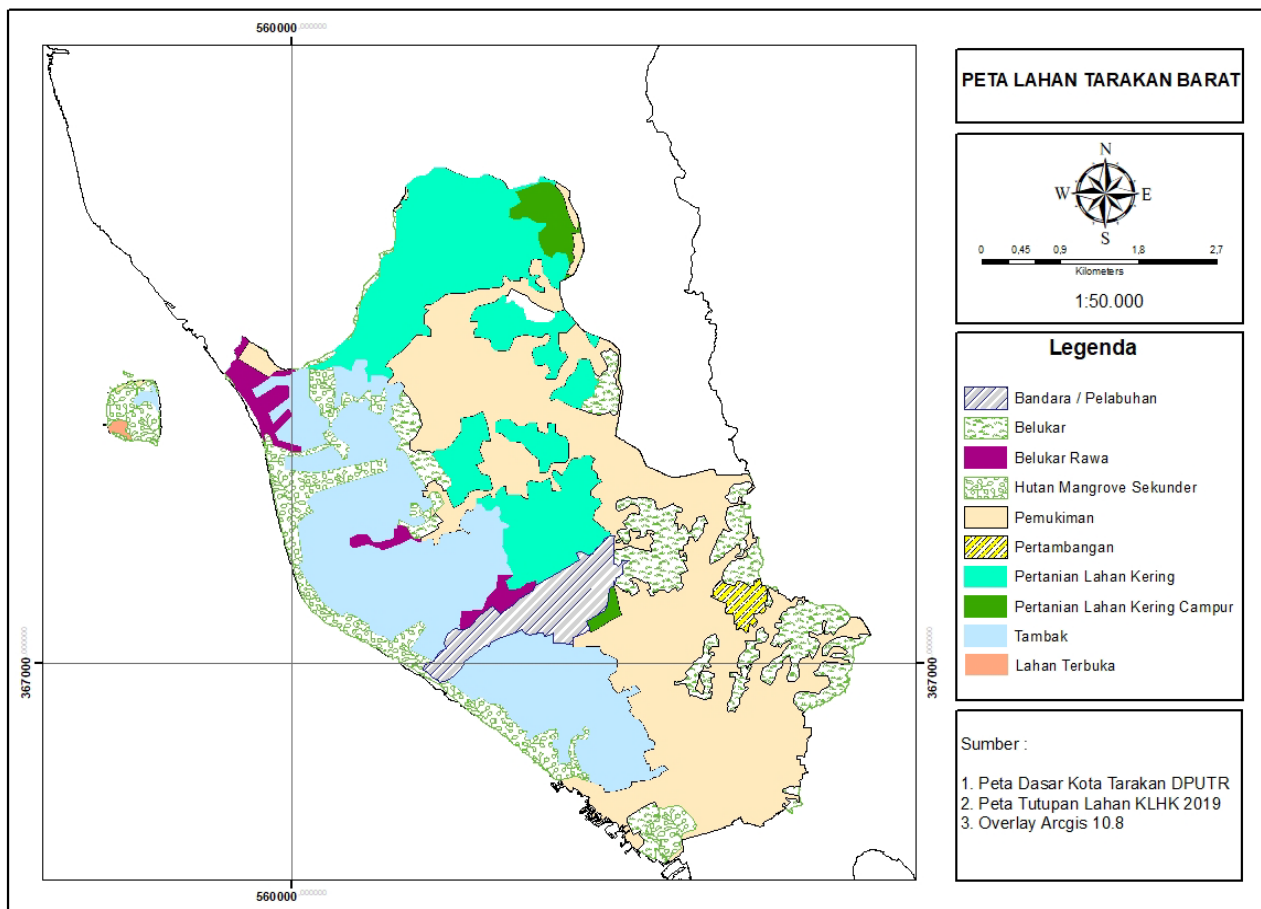


Figure 1. Land Use Map of West Tarakan District, Tarakan City. Source: Tarakan City Public Works Office Tarakan City Administration Map 2020, Tarakan City Public Works Office Land Use Map and the Indonesian Geospatial Information Agency

In the agricultural sector, there is use of cultivated land for biopharmaceutical and horticultural crops. The dominant plants cultivated in West Tarakan include mustard greens as much as 6,436 quintals covering 36 ha, large chili 2,738 quintals covering 38 ha, cayenne pepper 3,287 quintals covering 42 ha, and tomatoes 4,386 quintals covering 20 ha [9].

The soil fraction in West Tarakan's agricultural land contains more sand because the area is lowland, which is around 28 meters above sea level with a slope class of >40% covering an area of 254 km² [9]. The conditions on agricultural land can have an impact on plant growth, because the soil tends to be sandy, the organic matter content is relatively low, the soil temperature is high and water easily passes, so these conditions are unfavorable for plants [10]. Similarly, weeds as wild plants also need light, nutrients, water, CO₂ gas, space and so on, as a requirement of life like

cultivated plants [11]. So it is possible that there are only a few types of weeds that can grow and develop in the soil conditions in West Tarakan.

Based on the results of checking the soil pH while in the field on each weed plot, it can be said to be acid soil. The lowest soil pH was 3.7, while the highest soil pH was 6 with an average pH of 5.05. This condition shows that the weeds found are of various species, many in number, and have the ability to adapt even to unfavorable environments. This shows that these weeds are considered vicious because in extreme environmental conditions, weeds can still grow and reproduce.

The types of weeds that can be found in West Tarakan consist of 3 types of weed groups namely broadleaf, grasses, and sedges. The results are listed in Table 1.

Table 1. Types of weeds on vegetable cultivation land in West Tarakan

No	Name of Scientific Weed	Name of Area Weed	Category of Weeds
1	<i>Spermacoce exilis</i>	Kancing Palsu	broadleaf
2	<i>Cyperus compressus</i>	Payung Alang	sedges
3	<i>Fimbristylis miliaceae</i>	Babawangan	sedges
4	<i>Lindernia ciliata</i>		broadleaf
5	<i>Lindernia crustacea</i>	Brobos Kebo	broadleaf
6	<i>Ageratum conyzoides</i>	Babandotan	broadleaf
7	<i>Cyperus iria</i>	Jekeng	sedges
8	<i>Scoparia dulcis</i>	Jaka Tua	broadleaf
9	<i>Ludwigia parviflora</i>	Lakum Air	broadleaf
10	<i>Eleusin indica</i>	Belulang	grasses
11	<i>Echinochloa colona</i>	Padang Kili	grasses
12	<i>hedyotis corymbosa</i>	Rumput Mutiara	broadleaf
13	<i>coleus rotundifolius</i>	Kentang Hitam	broadleaf
14	<i>Phylantus niruri</i>	Meniran	broadleaf
15	<i>peperomia pellucida</i>	Susuruhan	broadleaf
16	<i>Digitaria sanguinalis</i>	Rumput Belalang	grasses
17	<i>Cleome rutidosperma</i>	Maman Ungu	broadleaf
18	<i>Imprata Cylindryca</i>	Alang-alang	grasses
19	<i>Centotheca lappacea</i>	Jukut Kideng	grasses
20	<i>Axonopus compressus</i>	Paitan	grasses

No	Name of Scientific Weed	Name of Area Weed	Category of Weeds
21	<i>Kyllinga brevifolia</i>	Jukut Pendul	sedges
22	<i>Leucas martinicensis</i>		broadleaf
23	<i>Sphagneticola trilobata</i>	Wedelia	broadleaf
24	<i>Amaranthus Spinusus</i>	Bayam Duri	broadleaf
25	<i>Juncus effucus</i>	Mendong	grasses
26	<i>Eclipta prostata</i>	Urang Aring	broadleaf
27	<i>Euporbia hirta</i>	Nanangkaan	broadleaf
28	<i>physalis angulata</i>	Ciplukan	broadleaf
29	<i>Asystasia gangetica</i>	Violet Cina	broadleaf
30	<i>Borreria Alata</i>	Setawar	broadleaf
31	<i>paspalum conjugatum</i>	Jukut Pahit	grasses
32	<i>Portulaca oleraceae</i>	Krokot	broadleaf
33	<i>Leptochloa chinensis</i>	Timunan	grasses
34	<i>Drymaria cordata</i>	Cemplonan	broadleaf
35	<i>Alternanthera sessilis</i>	Kremah	broadleaf
36	<i>Emilia sonchifolia</i>	Tempuh Wiyang	broadleaf
37	<i>Commelina nudiflora</i>	Aur-aur	broadleaf
38	<i>Andropogon aciculatus</i>	Rumput Jarum	grasses

Based on the results of weed identification on vegetable cultivation land in West Tarakan, 38 types/species of weeds were obtained. It is known that the types of weeds identified came from several different groups, including broadleaf weeds, grasses and puzzles. There were 24 types of weeds from the broad leaf group found in the field, including *Ageratum conyzoides*, *Alternanthera sessilis*, *Amaranthus spinosus*, *Asystasia gangetica*, *Borreria alata*, *Cleome rutidosperma*, *Coleus rotundifolius*, *Commelina nudiflora*, *Cyanthillium cinereum*, *Drymaria cordata*, *Eclipta prostata*, *Euporbia hirta*, *Hedyotis corymbosa*, *Leucas martinicensis*, *Lindernia ciliata*, *Lindernia crustacea*, *Ludwigia parviflora*, *Peperomia pellucida*, *Phyllanthus urinaria*, *Physalis angulata*, *Portulaca oleraceae*, *Scoparia dulcis*, *Spermacoce exilis*, *Tithonia diversifolia*. There are 10 weeds from the grasses group, including *Andropogon aciculatus*, *Axonopus compressus*, *Digitaria sanguinalis*, *Echinochloa colona*, *Eleusin indica*, *Juncus effucus*, *Lophatherum gracile*, *Paspalum conjugatum*, *Tradescantia spathacea*, *Urena lobata*. There are 4 types of weeds from the sedges group, including *Cyperus compressus*, *Cyperus iria*, *Fimbristylis miliaceae*, *Kyllinga brevifolia*.

The population/type of weeds on vegetable cultivation land in West Tarakan, in general, is more than the broadleaf group. Broadleaf weeds are relatively fast weeds and are able to produce abundant seeds so that their spread is very easy [12]. Weeds have the ability to produce a lot of seeds, especially seasonal weeds that can produce a lot of seeds in each season, this will be directly proportional to their ability to produce themselves quickly and in large quantities and the ability of weed seeds is high enough if compared to the seeds of cultivated plants, it was even found that some weed seeds that entered the intestines of animals still had the ability to grow and often weed seeds were found to germinate in animal manure [13].



Figure 2. Vegetable Cultivation Land in West Tarakan

Based on the conditions in the field, the farmers still cultivate the land immediately after the vegetables are harvested, then they are given manure or cow dung so that the weed seeds in the cow dung will germinate and then grow if environmental conditions are favorable. In general, weed propagation is fairly fast and easy both generatively and vegetatively. Generatively, weed seeds that are fine, light and in large numbers can be spread by wind, animals, water, and humans [14]. Vegetative propagation occurs

because the part of the stem that is in the soil will form buds which can later form new plants. Likewise, parts of plant roots, such as rhizomes, stolons, and tubers will sprout and form new plants if cut into pieces.

The results of the analysis of the SDR value on vegetable cultivation land in West Tarakan reached 100%. The results of the identification of weed vegetation analysis are in Table 2.

Tabel 2. Analysis of Weed Vegetation on Vegetable Cultivation Land in West Tarakan

No	Name of Scientific Weed	Name of Area Weed	SDR (%)
1	<i>Spermacoce exilis</i>	Kancing Palsu	2.69
2	<i>Cyperus compressus</i>	Payung Alang	4.55
3	<i>Fimbristylis miliaceae</i>	Babawangan	9.60
4	<i>Lindernia ciliata</i>		2.91
5	<i>Lindernia crustacea</i>	Brobos Kebo	2.58
6	<i>Ageratum conyzoides</i>	Babandotan	2.03
7	<i>Cyperus iria</i>	Jekeng	12.82
8	<i>Scoparia dulcis</i>	Jaka Tua	1.39
9	<i>Ludwigia parviflora</i>	Lakum Air	5.99
10	<i>Eleusin indica</i>	Belulang	13.82
11	<i>Echinochloa colona</i>	Padang Kili	4.14
12	<i>Hedyotis corymbosa</i>	Rumput Mutiara	7.73
13	<i>Coleus rotundifolius</i>	Kentang Hitam	1.42
14	<i>Phyllanthus niruri</i>	Meniran	4.43
15	<i>peperomia pellucida</i>	Susuruhan	0.28
16	<i>Digitaria sanguinalis</i>	Rumput Belalang	2.65

No	Name of Scientific Weed	Name of Area Weed	SDR (%)
17	<i>Cleome rutidosperma</i>	Maman Ungu	2.77
18	<i>Imprata Cylindryca</i>	Alang-alang	0.14
19	<i>Centotheca lappacea</i>	Jukut Kideng	0.16
20	<i>Axonopus compressus</i>	Paitan	6.23
21	<i>Kyllinga brevifolia</i>	Jukut Pendul	0.42
22	<i>Leucas martinicensis</i>		0.68
23	<i>Sphagneticola trilobata</i>	Wedelia	0.13
24	<i>Amaranthus Spinousus</i>	Bayam Duri	0.17
25	<i>Juncus effucus</i>	Mendong	0.13
26	<i>Eclipta prostata</i>	Urang Aring	1.20
27	<i>Euphorbia hirta</i>	Nanangkaan	0.26
28	<i>physalis angulata</i>	Ciplukan	0.26
29	<i>Asystasia gangetica</i>	Violet Cina	0.51
30	<i>Borreria Alata</i>	Setawar	1.98
31	<i>paspalum conjugatum</i>	Jukut Pahit	0.79
32	<i>Portulaca oleraceae</i>	Krokot	0.68
33	<i>Leptochloa chinensis</i>	Timunan	2.63
34	<i>Drymaria cordata</i>	Cemplonan	0.46
35	<i>Alternanthera sessilis</i>	Kremah	0.48
36	<i>Emilia sonchifolia</i>	Tempuh Wiyang	0.14
37	<i>Commelina nudiflora</i>	Aur-aur	0.17
38	<i>Andropogon aciculatus</i>	Rumput Jarum	0.56
JUMLAH			100

Based on the results of the analysis of SDR values on vegetable cultivation land in West Tarakan, there were 38 types of weeds identified with the highest SDR value of 13.82%, namely *Eleusin indica* weeds. *Eleusin indica* is a weed whose existence can be found in almost all cultivated lands, even residential areas.

Eleusin indica is a weed that can grow quickly as well as its breeding. *Eleusine indica* itself has a strong and dense root system that is very difficult to remove [15]. *Eleusine indica* weed reproduces mainly by seeds, the many and small seeds are very easily carried away [16]. This is in accordance with what was described by [17], which stated that *Eleusine indica* flowers all year round and each plant can produce as many as 140,000 seeds per season. So it is very natural that the population of *Eleusin indica* is very high and becomes

the dominant weed in vegetable cultivation areas in the West Tarakan region.

CONCLUSION

Identification of weeds on horticultural crop cultivation land in West Tarakan found 38 species of weeds consisting of 24 species of broadleaf, 10 species of grass, and 4 species of sedges. While the dominant weed on horticultural crop cultivation land in West Tarakan is *Eleusin indica* with a weed Summed Dominance Ratio (SDR) value of 13.82%.

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