PLANT MATERIALS SPECIALIST REPORT OF PLANTS FOR FIELD AND INCREASE PLANTINGS
August 2009
Introduction

This report provides a description of non-invasive, promising species featured for field and increase plantings in the Pacific Islands Area. Other species may be suitable and may be requested. Plantings are conducted with cooperators or clients through field offices. This document serves as a guide to field office personnel when considering plants for testing with cooperators. The excellent cooperation between plant materials and field office personnel in the Pacific Basin Area has enabled us to maintain a viable Plant Materials Program. We look forward to the continued high interest in plant materials by our field people who are so important to the success of the Program.

The basic job of the Plant Materials Program is to assemble, test, and release new plants for conservation use. Proven plants are formally released by the NRCS in cooperation with the University of Hawaii and other institutions. Plants released for public use are commercially produced by growers. Increase plantings are established with cooperators for the commercial production of the released plants.

Data collected from field plantings are used to document the release of new cultivars. The field planting is the final phase of testing in the plant materials systematic testing process. It is where a new plant is tested on a farm or other site under actual use conditions. Field plantings may also be used to gather additional information on previously released and commercially available plants and to demonstrate a new plant, technique, or practice. Information gained from field plantings is incorporated into the Field Office Technical Guide, fact sheets, plant guides, and other documents.

Field office personnel may request a field or increase planting of the plants in this report by contacting the Plant Materials Specialist by phone at: (808) 567-6866 extension 109 or by e-mail at: Robert.J.Joy@hi.usda.gov. After the Planting Plan for Field, Special, and Increase Plantings (ECS-PM-9 form) is completed by the field office and signed by the cooperator, it is sent for approval to the Plant Materials Specialist. Arrangements will then be made with the Plant Materials Center Manager and staff to send the plant materials to the field office for delivery to the cooperator. There is no charge for plant materials for approved plantings and they are shipped pre-paid. However, supplies are limited and plantings should be kept relatively small.

Field Office Role in Field and Increase Plantings

- Select clients who are interested and knowledgeable about the purpose of the planting.

- Complete the ECS-PM-9 form and send it to the Plant Materials Specialist for approval.

- Advise the client on the planting. Refer to the section on Plant Establishment Procedures from the Pacific Islands Area Vegetative Guide – Vegetative Technical Note No. 7.

- Follow the applicable FOTG Standard and Specification.

- Within 60 to 180 days, evaluate the planting and send photos with the completed evaluation form to the Plant Materials Specialist. This first evaluation of the field planting is especially important for cover crop plantings that are terminated for soil improvement within 60 to 90 days. The Photo Documentation Form (Conservation Planning Technical Note – No. 4) works well for sending photos.

- Evaluate the planting after the first year’s growth and again once each year for the next four years (unless the Plant Materials Specialist determines that no additional information can be learned and closes the planting) and send the evaluation and photos to the Plant Materials Specialist.

- The Field and Increase Planting Evaluation form has been streamlined for ease of use and consists of only a single page. The evaluation form is available from the Plant Materials Specialist. An example of the form is included in this report.
FIELD AND INCREASE PLANTING EVALUATION

Client: _______________________                Date Planted (m/y):__________________
Evaluator: ____________________                Plant Common Name: ________________
Date Evaluated: ________________               Cultivar Name or Accession #:__________

CHARACTERISTICS

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<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>Ratings (X)</th>
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<tr>
<td>Average Plant Height (ft., in.): Leaves</td>
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<td>Seed Heads/Pods</td>
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<td>Average Width or Spread (ft., in.):</td>
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<td>Times Mowed, Trimmed, Grazed/Yr:</td>
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<td>Plant Density or Stand:</td>
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<td>Plant Vigor:</td>
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<td>Ability to Compete with Weeds:</td>
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<td>Ease of Establishment:</td>
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<td>Shade Tolerance:</td>
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<td>Drought Tolerance:</td>
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<td>Insect Resistance:</td>
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<td>Disease Resistance:</td>
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<td>Tolerance to Low Fertility Soils:</td>
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<td>Tolerance to Grazing:</td>
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<td>Ability to Spread by Seed:</td>
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<td>Ability to Spread by Vegetative Means:</td>
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<td>Ease of Maintenance:</td>
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<tr>
<td>Quality of Growth for Intended Use:</td>
<td></td>
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Comments on overall plant performance, fertilizer and pesticides applied, unusual conditions, existing vegetation, explanation of ratings, and other factors:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Client’s comments and opinion of plant:
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Instructions: Evaluate planting with the client, if possible. Complete all items. Enter NA next to criteria that are not applicable. Use a separate form for each cultivar or accession number. Send one copy of the completed form to the Plant Materials Specialist and keep a copy for your files.
TERMS EXPLAINED

**Field Planting:** a planting conducted by a client/cooperator to evaluate the performance of a new plant under actual use conditions.

**Increase Planting:** a planting conducted by a client/cooperator to multiply the seed or vegetative parts of a formally released plant for commercial use or sale.

**Plant Density or Stand:** consider how much of the plant is there.

**Plant Vigor:** overall appearance or health of the plant.

**Ability to Compete with Weeds:** consider how many weeds there are compared to the plant being evaluated and if the plant is out-growing the weeds or vice versa.

**Ease of Establishment:** consider the time and effort it took for the plant to reach this stage of growth and density.

**Shade Tolerance:** consider how well the plant grows in shaded conditions.

**Drought Tolerance:** consider how well the plant handles dry conditions.

**Insect Resistance:** consider the amount and severity of insect damage observed on plant.

**Disease Resistance:** consider the amount and severity of disease present.

**Tolerance to Low Fertility Soils:** ability of the plant to establish itself and grow on a low fertility site.

**Tolerance to Grazing:** ability of the plant to re-grow and thrive after grazing.

**Ability to Spread by Seed:** consider the amount of volunteer seedlings found near the planting site.

**Ability to Spread by Vegetative Means:** consider the amount and rate the plant spreads by stolons (runners) or rhizomes.

**Ease of Maintenance:** amount of care required to keep the plant in the desired condition.

**Quality of Growth for Intended Use:** consider growth rate, uniformity, adaptability, and other characteristics important for intended use.

**Note:** locally occurring plants can be used for comparison when evaluating if they serve the same conservation purpose.
Arachis pintoi and Arachis glabrata (pinto and rhizoma peanut): These perennial peanuts are creeping, low growing legumes that make a dense cover. They are native to Brazil. Perennial peanuts are useful as low maintenance, permanent covers for erosion control and beautification. They have attractive yellow flowers. They may be used for forage and are grazed by all classes of livestock. Using the moveable chicken coop or “chicken tractor” system (http://en.wikipedia.org/wiki/Chicken_tractor), range chickens have been reported to do well grazing perennial peanuts in the Kona area of Hawaii. Propagation of rhizoma peanut (A. glabrata) is by rhizomes since very little seed is produced. Propagation of pinto peanut (A. pintoi) is by seed, cuttings, and stolons or runners. The seed is commercially available. Fact sheets on perennial peanuts can be found at: http://www2.ctahr.hawaii.edu/sustainag/CoverCrops/perennial_peanut.asp and http://www.tropicalforages.info/key/Forages/Media/Html/Arachis_glabrata.htm.
Chrysopogon zizanioides synonym Vetiveria zizanioides (‘Sunshine’ vetivergrass): This tall bunch grass is non-fertile and will not spread by seed. Propagation is by plant divisions or slips. Its main use is as a vegetative barrier (FOTG Practice Code 601), but it is used in many other ways for controlling erosion and improving water quality. It is planted as vegetative barriers throughout the PIA. The photo shows it planted for erosion control on Maui. The tops are used for mulch in the adjacent taro crop. Commercial producers are selling slips of ‘Sunshine’, so field plantings will be limited to special applications. A plant guide and PIER information sheet on ‘Sunshine’ are at: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technical/pmc/Sunshine_Vetive_grass_Plant_Guide_090521.pdf and http://www.hear.org/pier/species/chrysopogon_zizanioides.htm.
Crotalaria juncea (‘Tropic Sun’ sunn hemp): Sunn hemp is an erect, annual legume that grows very well throughout the Pacific Islands Area. The cultivar ‘Tropic Sun’ is an excellent cover/green manure crop that is resistant to root-knot nematodes and is non-toxic to animals. The photo shows a crop being cut by hand for mulching the soil surface. Green onions are planted through the mulch. This type of culture looks promising for areas such as American Samoa where equipment is limited. Sunn hemp is popular with farmers for soil improvement, nematode control, weed suppression, moisture retention, and temporary windbreak. ‘Tropic Sun’ seed is commercially available. Plantings will be limited to special plantings such as the type pictured. Further information on ‘Tropic Sun’ can be found at: http://plants.usda.gov/plantguide/pdf/pg_crju.pdf, http://www2.ctahr.hawaii.edu/oc/freepubs/pdf/GreenManureCrops/sunn hemp.pdf, and http://www.plant-materials.nrcs.usda.gov/pubs/hipmcrb8433.pdf.
Dodonaea viscosa (‘a’ali’i, lampuaye, Florida hopbush): A widely adapted indigenous shrub that is native to Hawaii and naturalized in the Northern Marianas. It is a good windbreak, hedge, screen, and landscaping plant. It is mostly seen growing to a height of approximately 10 feet, but can reach 25 feet under certain conditions. It has a slow to moderate growth rate. It is propagated by seed and its attractive seed capsules make colorful leis. We have formally released a selection collected on Molokai referred to as Kamilolola Germlasm ‘A’ali’i Source Identified Class of Natural Germlasm (pictured). A fact sheet on ‘a’ali’i may be viewed at: http://www.ctahr.hawaii.edu/oc/freepubs/pdf/OF-20.pdf.
Eragrostis variabilis (kawelu,’emoloa, lovegrass): A perennial bunchgrass that is endemic to Hawaii. It is an attractive grass that is found on all the main islands and in the Northwestern Hawaiian Islands. It occurs on coastal dunes and grasslands, open sites in dry forests, and on exposed cliffs up to approximately 3,600 feet. It shows promise for erosion control on critical areas, restoration, wildlife, and beautification. It may be somewhat short lived. It is propagated by seed. Because it is endemic to the Hawaiian Islands, it should be planted only in Hawaii. The kawelu pictured was collected on Kaho’olawe and was formally released as Kaho’olawe Germplasm Kawelu Source Identified Class of Natural Germplasm. Please see the following fact sheet for additional information: ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technical PMC/Kawelu_FactSheet1_090616.pdf.
Gliricidia sepium (gliricidia, quick stick, madre de cacao, rechesengel): Gliricidia is a fast growing leguminous tree that usually grows approximately 30 to 35 feet tall. It is used for windbreak, forage, and shade for crops such as cacao and coffee. It is popular for agroforestry practices. To maintain a compact, hedge type windbreak, it would require trimming as it gets somewhat rangy at maturity. The trimmings can be used for mulch and green manure. It is propagated by seeds and stem cuttings. The cuttings root easily which is why one of its common names is quick stick. PIER risk assessment and agroforestry fact sheets are at the following sites: http://www.hear.org/pier/species/gliricidia_sepium.htm and http://www.agroforestry.net/tti/Gliricidia-gliricidia.pdf.
Heteropogon contortus (piligrass, tanglehead): Piligrass is indigenous to the Pacific Islands Area and is widely distributed in the tropics and subtropics. The native Hawaiians used it to thatch their houses and other buildings in dry areas. It is a drought tolerant bunch grass. It is currently being used for erosion control and restoration on Kaho‘olawe. It is also used for forage, conservation cover, landscaping, and roadside revegetation. The piligrass pictured was collected on Kaho‘olawe and was formally released as Kaho‘olawe Germplasm Piligrass Source Identified Class of Natural Germplasm. It is propagated by seed. Interesting and helpful additional information on piligrass can be found at the following links: 
Musa sp. (dwarf Brazilian banana): This cultivar was named ‘Santa Catarina Prata’ in Brazil and is a delicious dessert banana that has enough wind tolerance to be used as an herbaceous wind barrier (FOTG Practice Code 603). It was brought to Hawaii from Brazil in 1979 by Dr. Leng Chia of the University of Hawaii. We began testing it because of requests from farmers in the PIA-West for multipurpose windbreaks, especially those that could produce an edible product. The University of Guam has evaluated it as a firebreak. It has performed well wherever it has been planted in the Pacific Islands Area. This banana is well accepted in the retail and wholesale food markets where it is, for marketing purposes, referred to as dwarf apple banana. Propagation is by offshoots and corms. Additional information on bananas is at:

http://www.extento.hawaii.edu/kbase/crop/crops/i_banana.htm
*Paspalum hieronymi* (‘Tropic Lalo’ paspalum): The cultivar ‘Tropic Lalo’ is widely adapted. It is a perennial, creeping grass that forms a dense cover. The photo shows it in a mowed condition as a terrace cover. It is tolerant of traffic and is low maintenance. It may be planted to grass waterways, terraces, farm roads, lawns, and used as a conservation cover in orchards. It produces very little seed so propagation is by stolons. Commercial growers are needed for ‘Tropic Lalo’ to make it available to the general public. The PMC will provide stolons or runners for cooperators to establish increase plantings for commercial production of ‘Tropic Lalo’. American Samoa and islands in the Pacific Islands West Area are in need of more field plantings to determine its range of adaptability, particularly with regard to soils. For additional information, a fact sheet on ‘Tropic Lalo’ can be found at the following link: [ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technical PMC/tropic_lalo.pdf](ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technical/PMC/tropic_lalo.pdf).
Pennisetum purpureum X Pennisetum glaucum (Napier X pearl millet hybrid): Hybrids of Napiergrass and pearl millet are sterile and not invasive. They are very leafy and make good forage for cut and carry animal feeding operations. A Napier x pearl millet hybrid called PMN Hybrid (shown) was developed by the Hawaiian Sugar Planters’ Association (now HARC) for the USDA-ARS Georgia Coastal Plain Experiment Station. It has thinner stems than other selections of Napier. A PMC developed hybrid (HA-5690) is a cross between banagrass, a tall Napier, and a male sterile pearl millet. HA-5690 performed well on a slope planting using the live fascine technique. These tall grasses have promise for herbaceous wind barriers, vegetative barriers, biomass for energy production, and forage. Propagation is by stem cuttings planted in furrows similar to sugar cane. Additional information is at:

http://www.tropicalforages.info/key/Forages/Media/Html/Pennisetum_purpureum.htm.
Polyscias guilfoylei (panax, tanitani): Native to Polynesia, panax is used as a space saving wind barrier or hedge. A previous planting of the accession pictured has attained a maximum height of approximately 28 feet. Panax is established with stem cuttings planted at a spacing of 2 feet between plants within the row. It may be planted in single or double rows. It has a maximum growth rate of approximately 7 feet per year. The plants in the picture are about 3 years old and 20 feet tall. Our trials on the PMC indicate that panax may need fertilizer inputs of over 200 pounds per acre per year of nitrogen for maximum growth. A soil test should be taken and the fertilizer recommendations followed. Additional information can be seen at: [http://www.hear.org/pier/species/polyscias_guilfoylei.htm](http://www.hear.org/pier/species/polyscias_guilfoylei.htm) and [http://www.plants.usda.gov/factsheet/pdf/fs_pogu.pdf](http://www.plants.usda.gov/factsheet/pdf/fs_pogu.pdf).
Sporobolus virginicus (seashore rushgrass, seashore dropseed, ‘aki’aki, totoput): An indigenous, creeping, perennial grass that is normally propagated by rhizomes. Recent tests indicate that it can be propagated by stolons if a rooting hormone is used and the stolons are kept continuously moist until they develop roots. It is native to sandy, coastal sites in tropical and subtropical areas worldwide. It is usually found just above the high-tide mark. It will grow up to 1,000 feet in elevation, but the soil must be fairly loose for the rhizomes to spread. It is performing well for erosion control on Kaho’olawe where ripping or chiseling was done to fracture the hard soil. It is drought tolerant and very salt tolerant and should be useful for shoreline, stream bank, and critical area stabilization. It is palatable to animals and can be grazed. Fact sheets may be seen at the following links: [http://plants.usda.gov/factsheet/pdf/fs_spvi3.pdf](http://plants.usda.gov/factsheet/pdf/fs_spvi3.pdf) and [http://www.fao.org/ag/AGP/AGPC/doc/Gbase/data/pf000328.htm](http://www.fao.org/ag/AGP/AGPC/doc/Gbase/data/pf000328.htm).
*Urochloa brizantha* synonym *Brachiaria brizantha* (signalgrass):

Signalgrass is a perennial, creeping grass. It can be used for pasture, conservation cover, critical areas, and waterways. Signalgrass will grow on a wide variety of soils with a pH range from 4 to 8. It is tolerant of soils with high aluminum concentrations. We have had successful field plantings with signalgrass as a waterway cover on Guam and a goat pasture in the Hilo area of Hawaii. It is propagated by seeds and stolons. A PIER species info sheet and a fact sheet on signalgrass can be found at:

http://www.hear.org/pier/species/urochloa_brizantha.htm and
*Vitex rotundifolia* (beach vitex, pohinahina): A native sprawling shrub that is approximately 6 inches to 2 feet tall. It is indigenous throughout the Pacific. The leaves are gray-green to silvery and the flowers are bluish purple. It is found growing naturally on sandy beaches, dunes, and rocky shorelines up to approximately 50 feet. However, observations indicate that it will grow at higher elevations. It is useful for shoreline and stream bank stabilization. Propagation is by seed and cuttings. The following link has additional information:

http://www2.hawaii.edu/~eherring/hawnprop/vit-rotu.htm
Waltheria indica (‘uhaloa, hi’aloa, sleepy morning): An indigenous shrub that has a strong stem emerging from the ground, but frequently branches near the ground. It usually has an upright and somewhat branching form. However, in some environments, it may have a semi-prostrate habit. It usually grows 2 to 3 feet tall, but has been reported to reach 6 feet. It has yellow to orange flowers. It grows throughout the tropics and is adapted to a wide variety of soils from sea level to over 3,000 feet in elevation. Because it is naturally found on disturbed sites and along roadsides, it should prove useful for restoration and critical area plantings. It is tolerant of drought, salt spray, and mildly salty soils. It is browsed by livestock and has medicinal properties. It is propagated by seed. Additional information is at: [http://www2.hawaii.edu/~eherring/hawnprop/wal-indi.htm](http://www2.hawaii.edu/~eherring/hawnprop/wal-indi.htm) and [http://www.fs.fed.us/global/iitf/pdf/shrubs/Waltheria%20indica.pdf](http://www.fs.fed.us/global/iitf/pdf/shrubs/Waltheria%20indica.pdf).