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THE USE OF WILD CANE, *SACCHARUM* HYBRID CLONE *MOENTAI*, FOR WINDBREAK IN HAWAII

Gordon T. Shigeura and Wade W. McCall

THE AUTHORS

Gordon T. Shigeura is Associate Horticulturist, Hawaii Agricultural Experimental Station and Area Specialist in Horticulture, Cooperative Extension Service, University of Hawaii.

Wade W. McCall is Specialist in Soil Management, Cooperative Extension Service, University of Hawaii.

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The use of windbreak, whether planted or constructed, depends on specific need. It depends on the type of crops being protected and the areas to be protected. Long-range protection from storm winds should be met with permanent plantings of trees and shrubs that attain heights of 30 to 100 feet. If the need is protection from strong tradewinds, as in the production of vegetable crops or protection of homesites, constructed barriers of burlap materials, wood lath, or saran cloth may be used. If desired, a dense, colorful, upright-growing shrub may be more appropriate to preserve the aesthetic value of the protected area. An upright and easily manageable wind barrier adapted to all island growing conditions and especially useful in protecting low-growing crops is the recently introduced wild cane, *Saccharum* hybrid clone *Moentai* (Fig. 1,2).

The purpose of this circular is to present information on the use of wild cane as a windbreak.

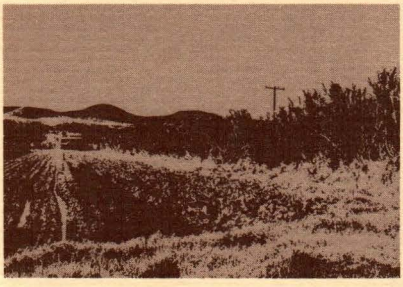

Figure 1. *Saccharum* hybrid clone *Moentai* being used in the Lalamilo farm lots to protect low growing vegetable crops.

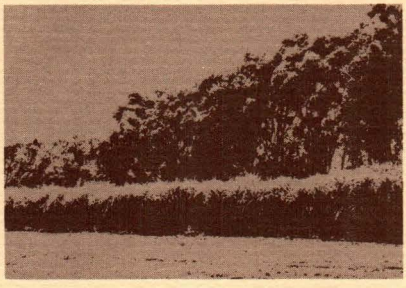

Figure 2. A row of *Saccharum* hybrid clone *Moentai* windbreak used along with a taller-growing row of *Eucalyptus robusta* in the Kamuela farm area.

INTRODUCTION OF WILD CANE

Saccharum hybrid clone *Moentai* was introduced in 1953 by Dr. A.J. Manglesdorf when he was Geneticist with the Hawaiian Sugar Planters' Association Experiment Station. The clone was found growing wild at an elevation of 300 feet along the banks of Mahakam River near Moara Moentai in Borneo. It is a vigorous plant producing underground rhizomes, and this trait was considered desirable for incorporation on the Station's cane breeding program.

The clone was orginally introduced as *Saccharum spontaneum moentai* because it was similar in appearance and growth habit to *S. spontaneum.* However, the chromosome number 2N=105 determined by Dr. Samuel Price, formerly Cytogeneticist with the U. S. Department of Agriculture, suggested it is not a true *S. spontaneum* but possibly a hybrid of the species.

The clone has been used in sugar cane breeding at the Experiment Station of the Hawaiian Sugar Planters' Association, and its descendents are being used in active breeding work today.

Figure 3. In-field windbreak planting at South Point, Hawaii, using *Saccharum* hybrid clone *Moentai* to protect small macadamia trees on the right.

USE AS A WINDBREAK

The *Saccharum* hybrid clone was first used as windbreak in a 1957 trial while the senior author was working on the Land Utilization Project with C. Brewer and Company in Ka'u. In the course of the project development, an area toward South Point with normal tradewinds ranging anywhere from 10 to 20 miles an hour was observed to be too windy for optimum tree growth (Figs. 3 and 4). To afford immediate protection of the crops and to determine the suitability of each of the windbreak materials tested, an "in-field" windbreak trial was installed using burlap bags, pigeon pea (*Cajanus indicus*), giant crotolaria (*Crotolaria* sp.), napier grass *(Pennisetum purpurea),* several species of sugar cane (*Saccharum officinarum*), and *Saccharum* hybrid clone *Moentai.* Within two years the evidence made it quite obvious that wild cane was the best species for use in this area as an in-field windbreak. Futher experimental trials planted in macadamia fields exposed to strong tradewinds and in the nursery area at Pahala, Hawaii, again indica-

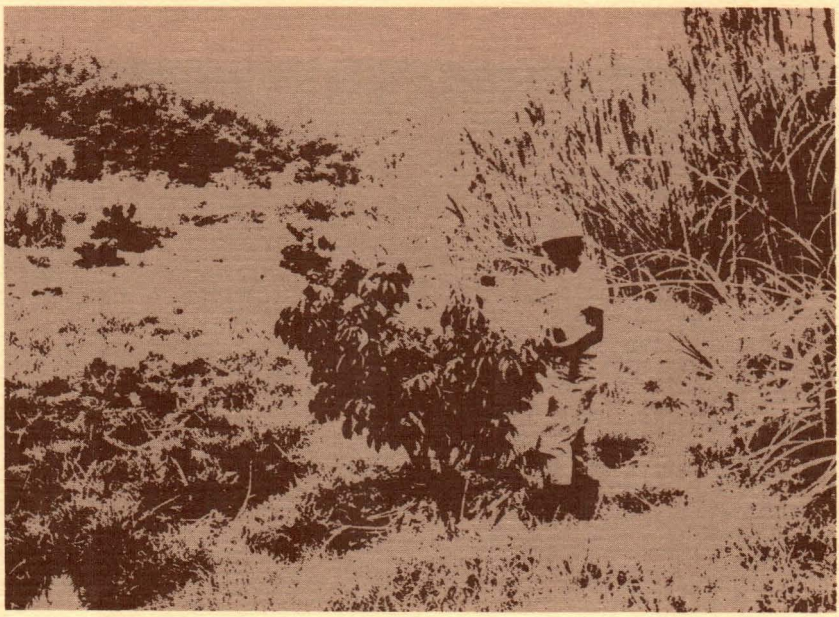

Figure 4. *Saccharum* hybrid clone *Moentai* used at Kaiholena, Hawaii, to protect small lychee trees.

ted the superiority of this clone. The clone is now being used advantageously throughout the state. Nowhere is it better used than in the wind-swept Lalamilo farm lots in Kamuela, Hawaii. Before the use of the clone the farmers were plagued with dust storms, making farming in Lalamilo very unproductive and amost marginal.

CULTURAL PRACTICES

The *Saccharum* hybrid clone is propagated either by stump divisions or by stem cuttings. Stump divisions are more difficult to handle than stem cuttings and are not recommended. Two or three node seed pieces or stem cuttings planted a foot or two apart are much easier to handle and make a good stand of growth. Weed control, irrigation, and fertilization are required only until the cane growth is about 3 feet high. After the initial period of growth, care can be very minimal.

The clone seems to be very well adapted to all soil conditions from aa lava to the very clayey hydrohumic latosols found in the high-rainfall area. It is now being used up to an elevation of at least

Figure 5. Badly lodged wild cane developed under excessively good cultural management.

2,700 feet. There is no reason, at the moment, to suppose that 2,700 feet is the upper limit of elevation in which this clone will thrive. It is an excellent perennial and once established maintains itself for a number of years. It also does not have any major insect or disease problem.

With reasonable care the overall growth of the *Saccharum* clone does not exceed 12 feet with the caney portions not much more than 6 to 8 feet high. When grown with reasonable care the caney stems are upright and can persist and be useful for many months. When necessary the canes can be removed at the base to afford more growth space for the new canes that are continually emerging from underground rhizomes.

Under exceptionally good management over all height of the canes can exceed 20 feet causing the canes to lodge and to occupy space needed by the cash crops being protected (Fig. 5). These lodged canes should be cut, water and fertilization drastically reduced, and general good care lessened. With experience in management the clones become very useful in that they require very little maintenance and care.

Figure 6. The vigorous rhizomatous development of *Saccharum* hybrid clone *Moentai* can become a serious drawback in its use if left unattended.

In older plantings the rhizomatous growth habit (Fig. 6) becomes more obvious and pronounced, necessitating plowing or rooting at the base of the windbreak to destroy the spreading rhizomes and to confine the windbreak to the desired area. This can be done relatively easily without hurting the main row of canes and need not be a deterrent to the use of this species for windbreaks in Hawaii.

The distance between windbreak rows depends on the growth height of crops being protected. Since wild cane is permeable to wind flow, good protection can be obtained in the area leeward to the windbreak for a distance 5 to 10 times the height of the windbreak row. With judicious maintenance and care the wild cane can grow upright about 12 feet high, providing good protection for distances between 60 to 120 feet. For low-growing vegetable crops a distance of 120 feet between windbreak rows is appropriate, while for crops like tomatoes and cucumbers grown on trellis 60 feet may be more appropriate.

Reference

McCall, Wade W., Gordon T. Shigeura, and Yusuf N. Tamimi. 1970. Windbreaks for Hawaii. Univ. Hawaii Coop. Ext. Ser. Circ. 438.

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