

*Tropical forage seed production in
Thailand: Maximizing seed yields through
the use of fertilizer and nylon bags for
collecting seed*





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Tropical Seeds contracts village farmers in Thailand and Laos to produce seed of six forage species

- *Mulato II*
- *Ubon paspalum*
- *Ubon Stylo*
- *Panicum maximum cv Mombasa*
- *Panicum maximum cv. Tanzania (Purple guinea TD58)*
- *Cayman*

LAOS

Political Map



Mulato II

- *Seed is produced in Nong Saeng village, Roi-et province and in villages in Oudomxay province, northern Laos.*
- *This year we will also produce a small amount of Cayman hybrid brachiaria in Nong Saeng village, Roi-et.*

Mulato II seed crop management

- *Farmers plant seed nurseries in May-June*
- *Transplant 4-5 week-old seedlings into fields in June-July.*
- *Plant in rows 1 m apart.*
- *Roi-et Thailand. Sweep the seed from the ground!*
- *Laos. Tie seed heads and knock seed out.*
- *All seed is acid treated at Ubon Ratchathani University*

Seed nursery



Preparing seedlings for transplanting



Planting seedlings in rows



Newly planted Mulato II seed crop



Hand weeding



Buffalo inter row cultivation weeding



Mulato II Laos



Cayman Thailand



Cayman Laos



Mulato II Thailand



Harvesting 1 Knocking Laos

- *Tie seedheads for the first time in mid October. Not before then.*
- *Tie seedheads the second time during seed flowering (anthesis).*
- *The first seed is the best. This seed is green not brown.*
- *Knock the seed out every day.*
- *Walk up and down the rows gently knocking seed out.*

















Drying in shade



Drying in the sun



Harvesting

2. Sweeping from the ground Thailand

- *Seeds fall out on to the ground.*
- *After all the seed has fallen, the plants are cut to ground level in late December. The plants are beaten with sticks to knock seed in the leaves on to the ground.*
- *The seeds are swept from the ground along with lots of sand and inert matter.*
- *The first cleaning is through screens in the field to remove soil, sand and inert matter.*



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18/12/2009 12:00



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Acid treatment and cleaning

- *At Ubon Ratchathani University all the Mulato II seed is acid treated, washed, dried and recleaned.*
- *Seed is packed into 25 kg bags and stored in a temperature controlled cool room at 18-20C and 50% relative humidity.*



















Tropical Seeds Mulato II seed production in Thailand

<i>Year</i>	<i>Farmers (no)</i>	<i>Villages (no)</i>	<i>Area (rai)</i>	<i>Production (kg)</i>
<i>2008-9</i>	<i>49</i>	<i>8</i>	<i>170</i>	<i>6,778</i>
<i>2009-10</i>	<i>45</i>	<i>1</i>	<i>165</i>	<i>9,959</i>
<i>2010-11</i>	<i>59</i>	<i>1</i>	<i>209</i>	<i>16,169</i>
<i>2011-12 estimated</i>	<i>72</i>	<i>1</i>	<i>312</i>	<i>25,000</i>

Tropical Seeds Mulato II seed production in Laos

<i>Year</i>	<i>Farmers (no)</i>	<i>Villages (no)</i>	<i>Area (rai)</i>	<i>Production (kg)</i>
<i>2008-9</i>	<i>252</i>	<i>16</i>	<i>742</i>	<i>4,492</i>
<i>2009-10</i>	<i>300</i>	<i>16</i>	<i>743</i>	<i>7,437</i>
<i>2010-11</i>	<i>381</i>	<i>16</i>	<i>825</i>	<i>12,073</i>
<i>2011-12</i>	<i>510</i>	<i>23</i>	<i>1,718</i>	<i>21,762</i>

Mombasa and Tanzania guinea

Mombasa and Tanzania

- *Seed production is in 3 provinces in Thailand; Ubon Ratchathani, Amnart Charoen and Mukdahan.*
- *Farmers plant in rows in July and harvest by knocking tied seed heads in October.*
- *Farmers clean the seed to international standards.*







Mombasa in double rows





Mombasa















Drying Mombasa in the shade





Ubon Forage Seeds
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Tropical Seeds Mombasa seed production in Thailand

<i>Year</i>	<i>Farmers (no)</i>	<i>Villages (no)</i>	<i>Area (rai)</i>	<i>Production (kg)</i>
<i>2008-9</i>	<i>126</i>	<i>8</i>	<i>146</i>	<i>7,318</i>
<i>2009-10</i>	<i>135</i>	<i>9</i>	<i>400</i>	<i>28,570</i>
<i>2010-11</i>	<i>225</i>	<i>8</i>	<i>514</i>	<i>36,024</i>
<i>2011-12</i>	<i>166</i>	<i>7</i>	<i>426</i>	<i>21,269</i>

Tropical Seeds Tanzania seed production in Thailand

<i>Year</i>	<i>Farmers (no)</i>	<i>Villages (no)</i>	<i>Area (rai)</i>	<i>Production (kg)</i>
<i>2009-10</i>	<i>60</i>	<i>3</i>	<i>90</i>	<i>10,726</i>
<i>2010-11</i>	<i>56</i>	<i>4</i>	<i>80</i>	<i>7,050</i>
<i>2011-12</i>	<i>47</i>	<i>4</i>	<i>69</i>	<i>2,435</i>

Ubon paspalum

















Tropical Seeds Ubon paspalum seed production in Thailand

<i>Year</i>	<i>Farmers (no)</i>	<i>Villages (no)</i>	<i>Area (rai)</i>	<i>Production (kg)</i>
<i>2009-10</i>	<i>38</i>	<i>1</i>	<i>126</i>	<i>12,603</i>
<i>2010-11</i>	<i>6</i>	<i>1</i>	<i>20</i>	<i>730</i>
<i>2011-12</i>	<i>47</i>	<i>1</i>	<i>47</i>	<i>2,727</i>

Ubon stylo



















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Tropical Seeds Ubon stylo seed production in Thailand

<i>Year</i>	<i>Farmers (no)</i>	<i>Villages (no)</i>	<i>Area (rai)</i>	<i>Production (kg)</i>
<i>2008-9</i>	<i>30</i>	<i>1</i>	<i>60</i>	<i>6,400</i>
<i>2009-10</i>	<i>30</i>	<i>1</i>	<i>20</i>	<i>1,950</i>
<i>2010-11</i>	<i>26</i>	<i>1</i>	<i>60</i>	<i>6,265</i>
<i>2011-12 estimated</i>	<i>30</i>	<i>1</i>	<i>50</i>	<i>6,000</i>

Profitability of forage seed production in Thailand

- *Forage seed crops are more profitable than rice.*
- *Land competition from cassava and rubber in many districts.*
- *Cassava is the main competitor.*
- *Farmers plant cassava and business people come into villages to rent land for cassava.*

Estimated costs and gross and net income (baht/rai) from rice, cassava and forage seeds

	<i>Rice</i>	<i>Cassava</i>	<i>Ubon paspalum</i>	<i>Mulato II</i>	<i>Ubon stylo</i>	<i>Mombasa</i>
<i>Direct costs</i>	<i>3,800</i>	<i>6,100</i>	<i>2,750</i>	<i>3,500</i>	<i>4,000</i>	<i>2,750</i>
<i>Gross Income</i>	<i>5,400</i>	<i>11,200</i>	<i>7,200</i>	<i>14,400</i>	<i>10,200</i>	<i>8,000</i>
<i>Net Income</i>	<i>1,600</i>	<i>5,100</i>	<i>4,460</i>	<i>10,900</i>	<i>6,200</i>	<i>5,250</i>

Maximizing forage seed yields using fertilizer

- *Soils in northeast Thailand are very poor.*
- *Research studies have increased seed yields from using fertilizer.*
- *Ubon paspalum seed yields have increased by 25-70% using nitrogen.*
- *Jarra digit seed yields increased by 100% using nitrogen.*
- *Mulato II seed yields increased by 74% using NPK.*
- *Townsville stylo seed yields increased by 60% from sulphur*

Number of farmers, area, amount of fertilizer and funds required in 2012-13 for forage seeds

<i>Area of production</i>	<i>No. of existing farmers</i>	<i>Area to be planted (rai)</i>	<i>Fertilizer for 80% of farmers (kg)</i>	<i>Funds for 80% of farmers (baht)</i>
<i>Thailand</i>	<i>365</i>	<i>1,460</i>	<i>58,400</i>	<i>1,168,000</i>
<i>Laos</i>	<i>510</i>	<i>1,530</i>	<i>61,200</i>	<i>1,224,000</i>
<i>Total</i>	<i>875</i>	<i>2,990</i>	<i>119,600</i>	<i>2,392,000</i>

Maximizing seed yields by using nylon bags to collect seed

- *Nylon bags tied around grass seed heads just after anthesis have increased seed yields in research studies.*
- *Seed yields of Tanzania guinea increased by 36%, Ubon paspalum by 75% and Mulato II by 100%.*

- *Nylon bags catch the seed as it falls out of the seed heads.*
- *Nylon bags not only increase seed yields but reduce the risk of low seed yields.*
- *Harvesting Ubon paspalum, Mombasa and Tanzania guinea and Mulato II by tying seed heads can be risky due to rain and wind during flowering and harvesting.*

Nylon bags collecting hybrid brachiaria seed in research plots



Nylon bags collecting Mombasa seed in research plots



Farmer tying a nylon bag over Ubon paspalum seed heads





Farmer field of Ubon paspalum with nylon bags to collect seed



Costs of nylon bags

- *Nylon bags cost between 20-30 baht/bag for the nylon material and cost of cutting and sewing.*
- *Too expensive for farmers, Need 2,000 bags/rai in Thailand and 1,000 bags/rai in Laos.*
- *However, bags will last for over 5 years if carefully looked after.*
- *Farmers would rather receive rolls of nylon and cut and sew the bags themselves.*
- *One roll costs 800 baht and 80 bags can be made.*

- *Tropical Seeds would provide bags for 1 rai of seed crop per farmer.*
- *Only provide bags to 770 current farmers.*
- *We expect that only 40% of farmers would like to try bagging, requiring a budget of 4,120,000 baht.*
- *Nylon bags would increase income from between 1,200 baht/rai for Mulato II in Laos to 4,000 baht baht/rai for Ubon paspalum in Thailand*

Cost of nylon bag project for harvesting grass seeds

<i>Species</i>	<i>Area to be bagged (rai)</i>	<i>No. of plants</i>	<i>Cost of bags (baht)</i>	<i>Cost @ 60% uptake</i>
<i>Mombasa Thailand</i>	<i>166</i>	<i>332,000</i>	<i>3,320,000</i>	<i>1,328,000</i>
<i>Tanzania Thailand</i>	<i>47</i>	<i>94,000</i>	<i>940,000</i>	<i>376,000</i>
<i>Ubon paspalum Thailand</i>	<i>47</i>	<i>94,000</i>	<i>940,000</i>	<i>376,000</i>
<i>Mulato II Laos</i>	<i>510</i>	<i>510,000</i>	<i>5,100,000</i>	<i>2,040,000</i>
<i>Total</i>	<i>770</i>	<i>1,030,000</i>	<i>10,300,000</i>	<i>4,120,000</i>

Increase in seed yield and farmer income from using nylon bags

<i>Species</i>	<i>Current average yields (kg/rai)</i>	<i>Expected yields from bags (kg/rai)</i>	<i>Price per kg seed (baht)</i>	<i>Income increase from using bags (Baht/rai)</i>
<i>Mombasa</i>	<i>60</i>	<i>90</i>	<i>100</i>	<i>3,000</i>
<i>Tanzania</i>	<i>80</i>	<i>120</i>	<i>80</i>	<i>3,200</i>
<i>Ubon paspalum</i>	<i>90</i>	<i>140</i>	<i>80</i>	<i>4,000</i>
<i>Mulato II Laos</i>	<i>10</i>	<i>20</i>	<i>120</i>	<i>1,200</i>

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