

# **The Eastern Africa Agricultural Productivity Project (EAAPP)**

**National Livestock Resources Research  
Institute**

**Dairy Research Component**

**World Bank Review Mission:  
Progress Report (June to December 2013)**

# Dairy research component projects

1. Enhancing adoption of Napier grass varieties tolerant to Napier stunt disease for increased feed availability in smallholder dairy systems
2. Forage seed multiplication
3. Nutritional improvement of low value crop residues and agro-industrial by-products
4. Enhancement of the utilization of Muguga cocktail vaccine in the smallholder dairy farming systems

# Dairy research component projects

5. Identification and characterization of milk-borne zoonotic organisms including haemorrhagic *E. coli*
6. Improving indigenous cattle for dairy production through targeted selection and cross breeding

# Project 1: Enhancing adoption of Napier grass varieties tolerant to Napier stunt disease for increased feed availability in smallholder dairy systems

## Research team members (Uganda)

Name	Designation	Institution
Dr. Jolly Kabirizi,	Forage scientist (PI)	NaLIRRI
Dr. Swidiq Mugerwa	Animal nutritionist	NaLIRRI
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Mr. Joseph Okiring	Farm Manager	NaLIRRI
Mr. Geoffrey Kawube	Pathologist	NACRRI
Mrs. Grace Ebiyau	Technician	NaLIRRI
Ms. Clementine Namazzi	Technician	NaLIRRI
Ms. Agnes Namagembe	Technician	NaLIRRI

## Expected outcome: Increased availability of feed in smallholder dairy systems

<b>Expected output 1:</b> Technologies and innovations for managing Napier stunt disease (NSD) developed and promoted			<b>Output Indicator 1.1:</b> No. of Napier grass clones tolerant to NSD promoted by end of 2014
<i>Planned Activities (June-Dec '13)</i>	<i>Target</i>	<i>Achieved June-Dec 2013</i>	<i>Planned Activity 2014</i>
Promote /multiply Napier grass clones tolerant to NSD	4 Napier grass clones tolerant to NSD promoted/multiplied	Clones: 97, 16085, 112, 16702, Kakamega 1 & 2 that showed high tolerance (score 1-2) to NSD were promoted	Multiply and distribute planting materials to 5 sites in 5 districts through NAADS & ZARDIs

## Mean herbage DM yield (t/ha/yr) and crude protein content (%) of promising Napier grass clones

Napier grass clone	Mean DM yield (t/ha)	CP (%)
Kakamega 1	42.0	7.3
Kakamega 2	40.4	7.3
112	39.5	7.7
16702	36.8	7.4
97	35.3	7.3
16805	32.3	8.0
41	29.1	8.4
75	28.0	7.4
105	26.9	8.3
103	26.4	6.8
16814	26.3	8.5

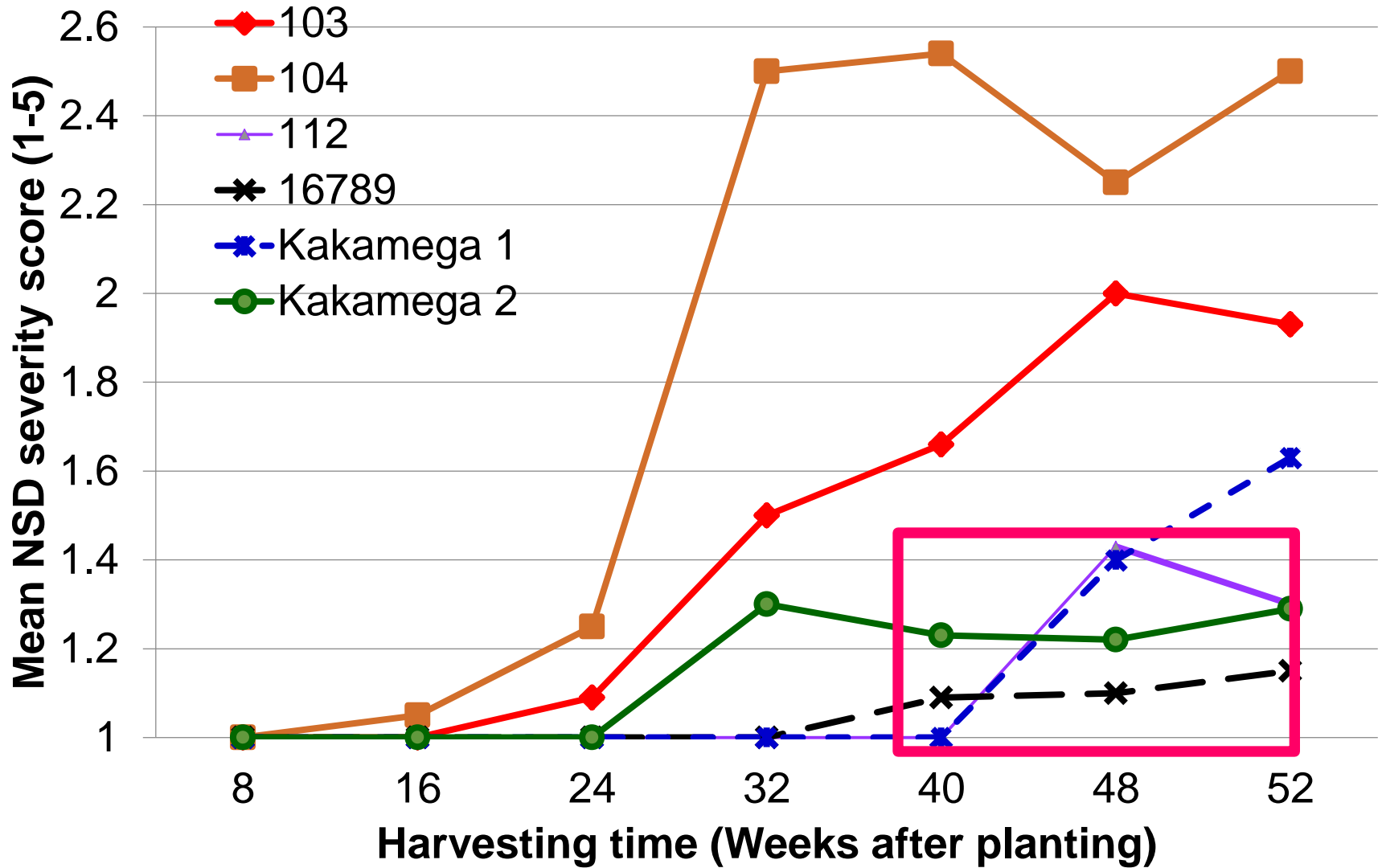
Napier grass clone	Mean DM yield (t/ha)	CP (%)
76	26.1	6.7
Kakamega 3	26.1	7.1
16815	25.8	8.4
79	25.5	8.5
19	24.4	7.3
117	23.5	7.6
16789	23.5	7.7
ANF	22.9	6.4
79 SN	21.2	9.2
104	17.9	6.8
River Bank	17.1	8.9
<b>SEM</b>	<b>4.66</b>	<b>1.1</b>

Crude protein yield (%); 79 SN= Sugar cane x Napier grass hybrid

## Expected outcome: Increased availability of feed in smallholder dairy systems

<b>Expected output 1:</b> Technologies and innovations for managing Napier stunt disease (NSD) developed and promoted			<b>Output Indicator 1.1:</b> No.of tolerant Napier grass clones evaluated & promoted by end of 2014
<i>Planned Activities</i>	<i>Target</i>	<i>Achieved June-Dec 2013</i>	<i>Planned Activity 2014</i>
Promote /multiply Napier grass clones tolerant to NSD	4 Napier grass clones tolerant to NSD promoted/multiplied	<b>Severity of NSD varied due to:</b> <ul style="list-style-type: none"> <li>■ genotype,</li> <li>■ soil fertility</li> <li>■ weather</li> <li>■ harvesting stage</li> </ul>	Multiply and distribute planting materials to 5 sites in 5 districts through NAADS & ZARDIs

# Mean NSD severity at different harvesting times



Score 1 = no symptoms, 2 = very mild symptoms, 3 = medium mild symptoms, 4 = severe symptoms and 5 = very severe symptoms



## Expected outcome: Increased availability of feed in smallholder dairy systems

<b>Expected output 1:</b> Technologies and innovations for managing NSD developed and promoted			<b>Output Indicator 1.1:</b> No. of Napier grass clones tolerant to NSD promoted/multiplied by end of 2014
<i>Planned Activities</i>	<i>Target</i>	<i>Achieved July-Dec '13</i>	<i>Planned Activity 2014</i>
Multiply Napier grass clones tolerant to NSD	4 Napier grass clones multiplied	<ul style="list-style-type: none"> <li>■ Clones 112, Kakamega 1, Kakamega 2 &amp; 16805 multiplied:</li> <li>■ NaLIRRI (2 acres),</li> <li>■ Masaka (2 acres)</li> <li>■ Jinja (2 acres)</li> <li>■ NaCRRI (1 acre)</li> </ul>	Multiply and distribute planting materials to 5 sites in 5 districts through NAADS & ZARDIs

## Expected outcome: Increased availability of feed in smallholder dairy systems

**Expected output 1:** Technologies and innovations for managing NSD developed and promoted

**Output Indicator 1.2:**  
No. of tolerant clones promoted

<i>Planned Activities</i>	<i>Target</i>	<i>Achieved July-Sept '13</i>	<i>Planned Activity 2014</i>
Assess effect of manure application on severity of NSD	One type of manure (cattle) manure	<ul style="list-style-type: none"> <li>■ Trials established at NaLIRRI, BUGIZARDI, NaCRRI &amp; Kamenyamiggo</li> <li>■ Decrease (20%) in NSD incidence where manure was applied</li> </ul>	Continue with trial (2 seasons)

**Expected output 1:** Generation of technologies and innovations for managing NSD enhanced

**Output Indicator 1.2:** Number of tolerant clones promoted

<i>Planned Activities</i>	Target	<i>Achieved</i>	Planned 2014
Assess economic losses due to NSD	4 clones evaluated	■ Net financial effect of reduction in milk incomes and added cost due to NSD resulted in a negative net financial effect of Ushs 1.5m.	Publish information
		■ NSD led to a financial drain equivalent to 54 % of the gross revenues from milk.	

## Expected outcome: Increased availability of feed in smallholder dairy systems

<b>Expected output 2:</b> Capacity for stakeholders to utilize NSD management technologies strengthened		<b>Output Indicator 2.1:</b> No. of key stakeholders trained	
<i>Planned Activities</i>	<i>Target</i>	<i>Achieved</i>	<i>Planned Activity</i>
Sensitize stakeholders on NSD control methods & use of alternative forages/	1,000 stakeholders trained	<ul style="list-style-type: none"> <li>■ 1,200 stakeholders (670 female, 450 male &amp; 80 youths) were trained in Mbarara, Wakiso, Kabalore, Mbarara, Soroti, Tororo and Gulu districts</li> </ul>	Farmer evaluation of tolerant clones
		<ul style="list-style-type: none"> <li>■ Overall farm mgt improved</li> <li>■ Increased (25%) milk yield</li> </ul>	

## Expected outcome: Availability of forage feed in smallholder dairy systems improved

### Expected output 2:

Availability of information on NSD management methods enhanced

**Output Indicator 2.1:** Number of information packages produced and distributed

<i>Planned Activities</i>	<i>Target</i>	<i>Achieved</i>	<i>Planned Activity</i>
Package and disseminate research results	Present 4 papers during scientific conferences/workshops	<ul style="list-style-type: none"> <li>■ FARA conference, Ghana, July 2013</li> </ul>	Publish papers
		<ul style="list-style-type: none"> <li>■ African Crop science conference, Uganda, Oct 2013</li> </ul>	
		<ul style="list-style-type: none"> <li>■ 22<sup>nd</sup> International Grassland Congress, Australia, Oct 2013</li> </ul>	

## **Expected outcome: Availability of forage feed in smallholder dairy systems improved**

<b>Expected output 2:</b> Availability of information on NSD mgt methods enhanced		<b>Output Indicator 2.1:</b> Number of information packages produced and distributed	
<i>Planned Activities</i>	<i>Target</i>	<i>Achieved</i>	<i>Planned Activity</i>
Package and disseminate research results	4 papers presented during scientific conferences (cont.)	<ul style="list-style-type: none"> <li>■ INWES regional conference, Nairobi, Nov 2013</li> </ul>	Publish papers
		<ul style="list-style-type: none"> <li>■ ASARECA Livestock and Fisheries Programme Scientific conference, Dar es Salaam, Nov. 2013</li> </ul>	
		<ul style="list-style-type: none"> <li>■ 2<sup>nd</sup> ASARECA General Assembly &amp; scientific conference, Burundi, Dec 2013</li> </ul>	

## Expected outcome: Availability of forage feed in smallholder dairy systems improved

### Expected output 2:

Availability of information on NSD management methods enhanced

### Output Indicator 2.1:

Number of information packages produced and distributed

<i>Planned Activities</i>	<i>Target</i>	<i>Achieved</i>	<i>Planned Activity</i>
Package and disseminate research results	Publish 2 papers in referred journals/ conference proceedings	<ul style="list-style-type: none"> <li>■ <i>Tropical grasslands Journal</i> Vol. 1, issue 3 (Dec 2013) pp. 212 to 2013</li> </ul>	Publish papers
		<ul style="list-style-type: none"> <li>■ Special International Grasslands Congress issue, pp 812-814. Print ISBN: 978-1-74256-543-9</li> </ul>	
		<ul style="list-style-type: none"> <li>■ <b>In press</b> Elsevier journal, ID:102000118</li> </ul>	

## Project 2: Forage seed production project

**Expected outcome:** Availability of forage feed in smallholder dairy systems improved

**Expected output 1:** Seed availability of selected forage species increased

**Output Indicator 1.1:** Acreage of forage seed crop established

<i>Planned Activities</i>	<i>Target</i>	<i>Achieved</i>	<i>Planned Activity</i>
Establish forage seed multiplication sites	Establish 20 ha of forage seed crop	Forage seed crop established: <ul style="list-style-type: none"> <li>■ NaLIRRI (17.5 ha),</li> <li>■ NaCCRI (6 ha)</li> <li>■ MuZARDI (1.5 ha),</li> <li>■ Masaka (2 ha)</li> <li>■ Wakiso (6 ha)</li> </ul>	Harvest and distribute seed



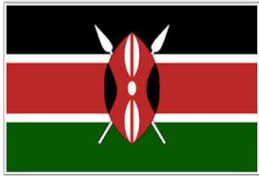
## Expected outcome: Availability of forage feed in smallholder dairy systems improved

### Expected output

1: Seed availability of selected forage species increased

**Output Indicator 1.2:** Acreage of forage seed crop established

<i>Planned Activities</i>	<i>Target</i>	<i>Achieved</i>	<i>Planned Activity</i>
Establish forage seed multiplication sites	Harvest & distribute 500 kg of forage seed	<ul style="list-style-type: none"> <li>200 kg of <i>Clitoria ternatea</i> seed harvested and distributed to 15 farmers (10 female &amp; 5 male)</li> </ul>	Harvest & distribute seed through NAADS and ZARDIs
		<ul style="list-style-type: none"> <li>250 kg of <i>Lablab purpureus</i> distributed to 20 farmers (10 female &amp; 10 male) in Ntungamo district</li> </ul>	
		<ul style="list-style-type: none"> <li>300 kg <i>Chloris gayana</i> distributed to 20 female &amp; 10 male farmers)</li> </ul>	



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