

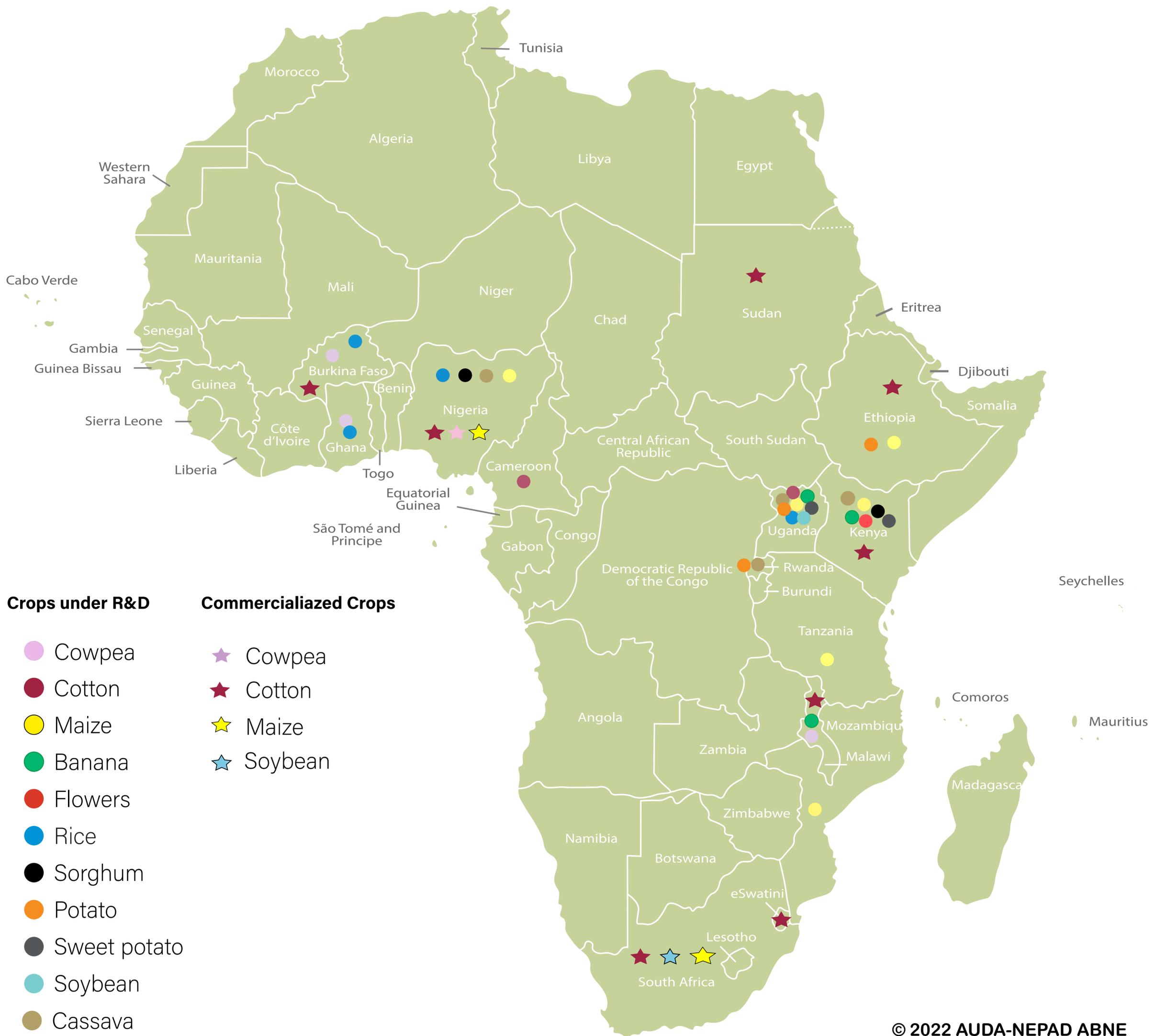
# Genetically Modified (GM) Crops in Africa

## *A Country Guide*



**African Biosafety Network  
of Expertise (ABNE)**

# GM Crops: Overview



## Crops under R&D

- Cowpea
- Cotton
- Maize
- Banana
- Flowers
- Rice
- Sorghum
- Potato
- Sweet potato
- Soybean
- Cassava

## Commercialized Crops

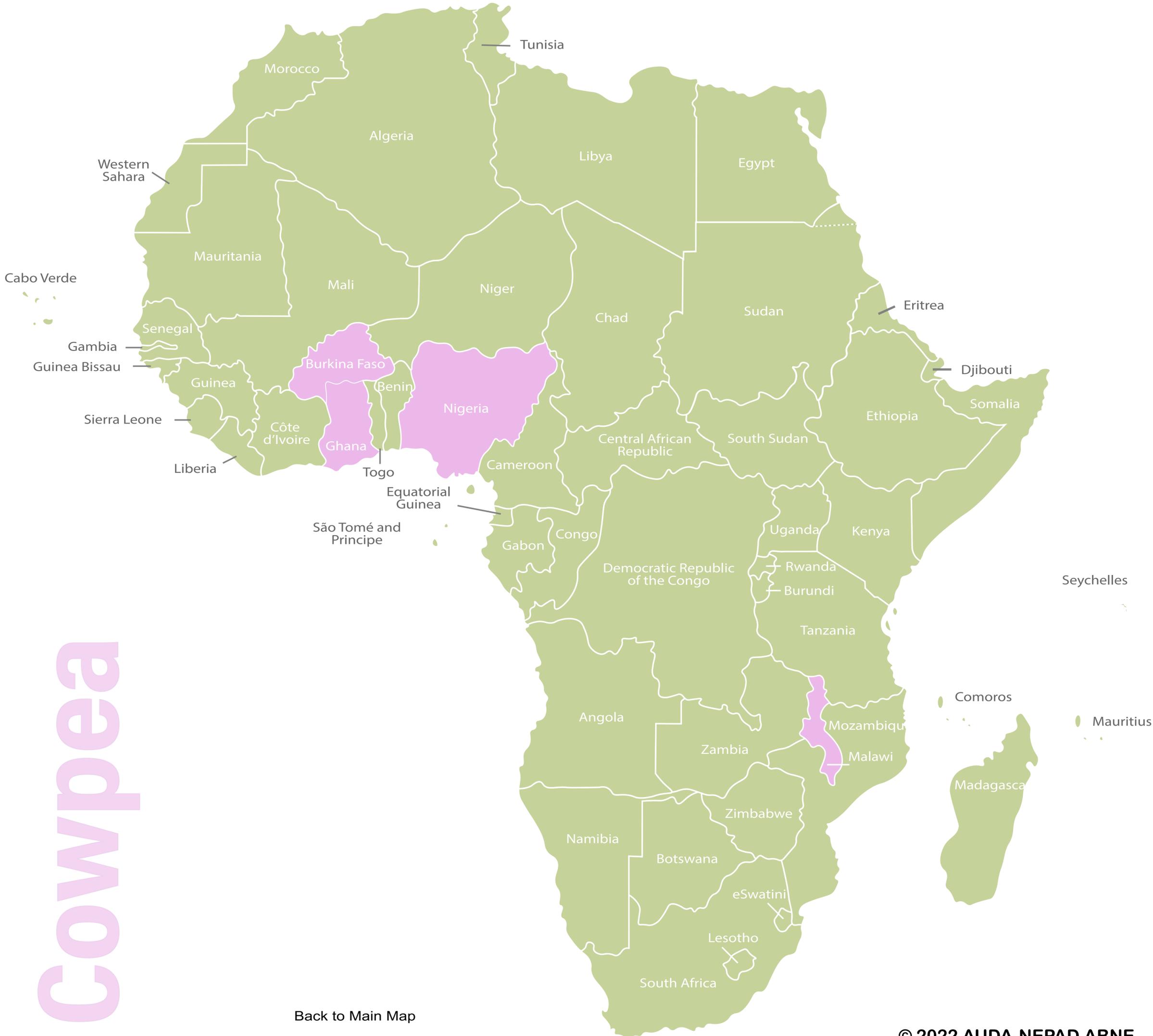
- ★ Cowpea
- ★ Cotton
- ★ Maize
- ★ Soybean

# GM Crops Developed in Africa



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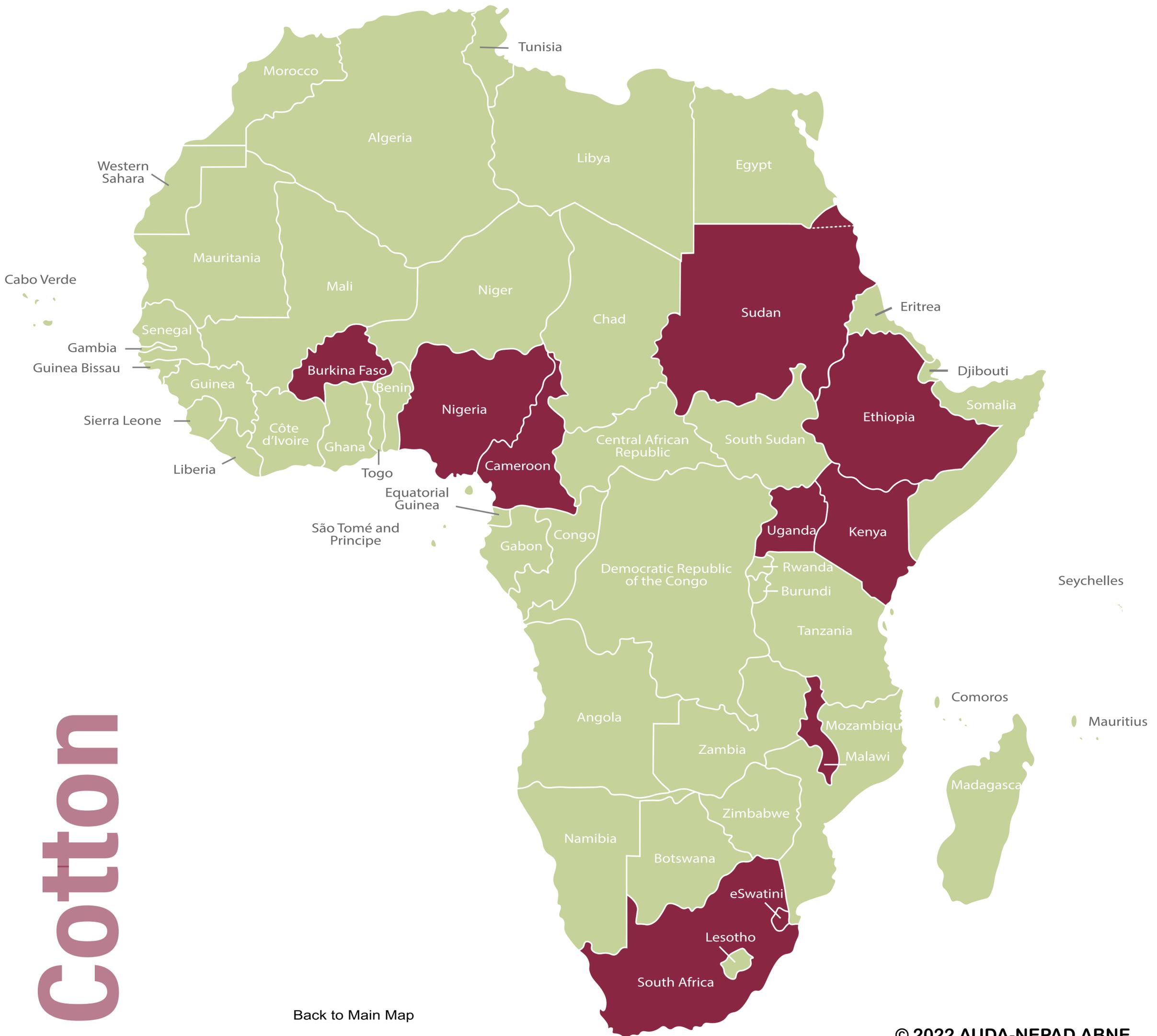
# GM Crops Developed in Africa



Cowpea

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# GM Crops Developed in Africa



Cotton

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# GM Crops Developed in Africa



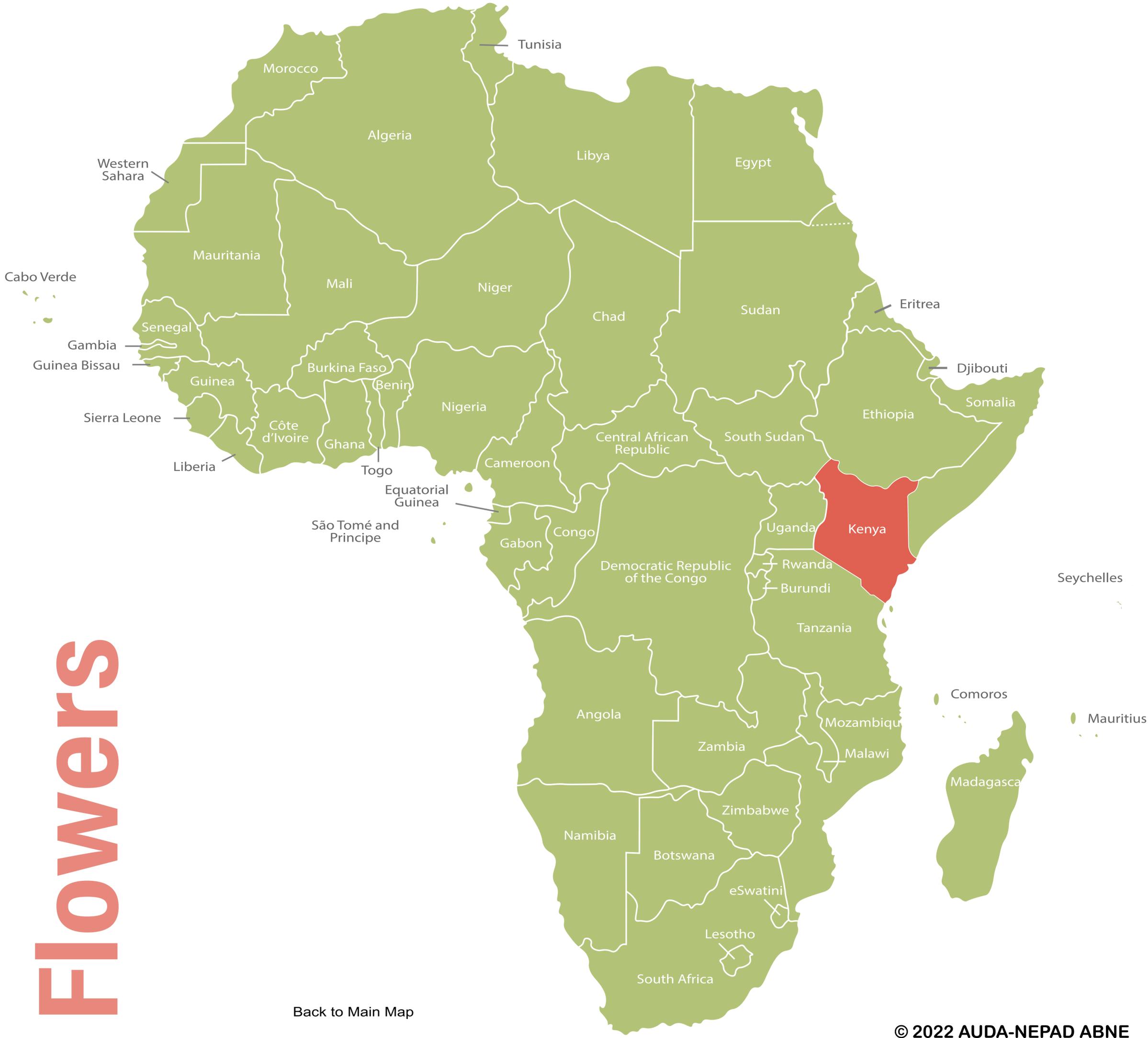
**Maize**

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# GM Crops Developed in Africa



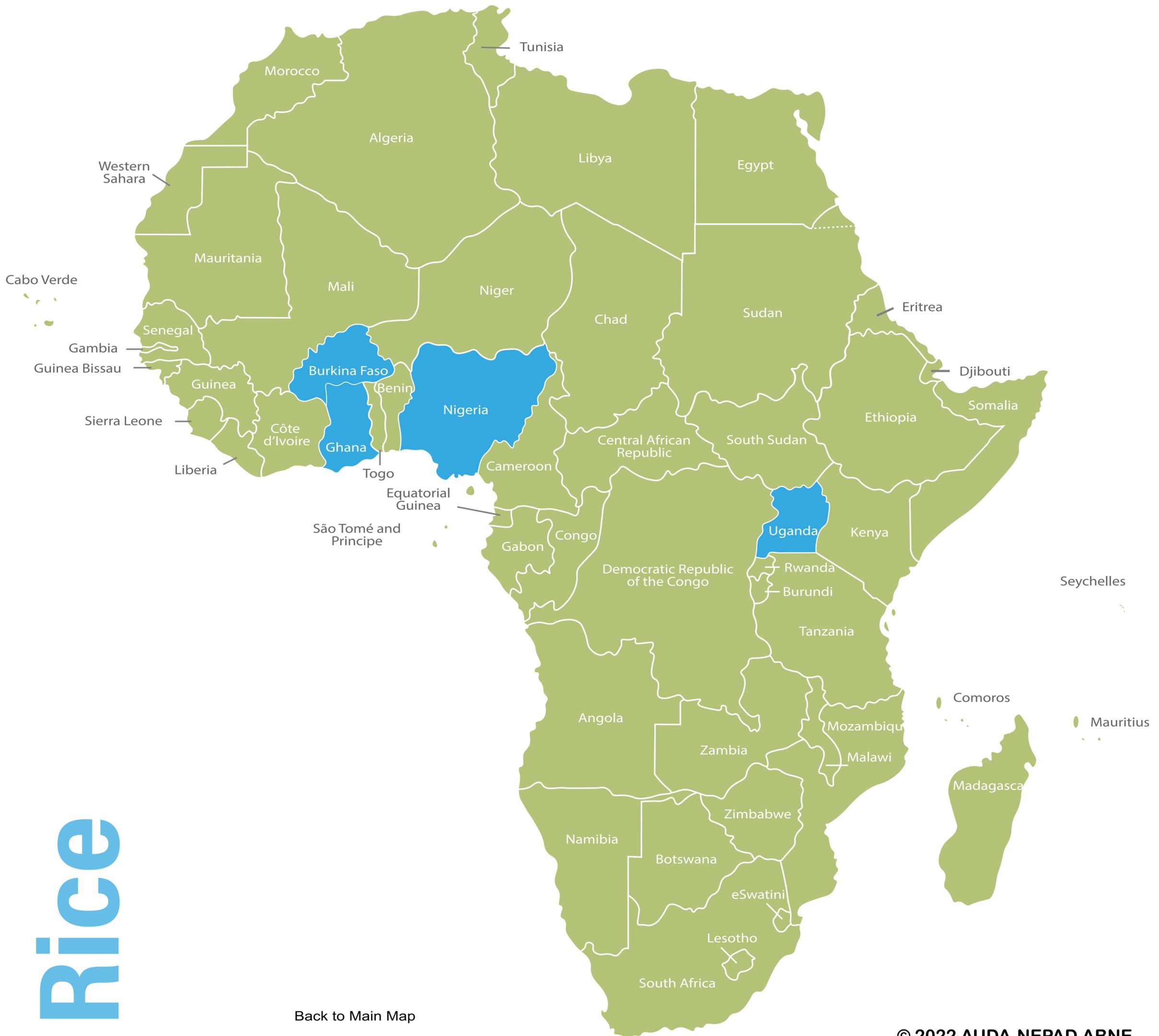
# GM Crops Developed in Africa



**Flowers**

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# GM Crops Developed in Africa



**Rice**

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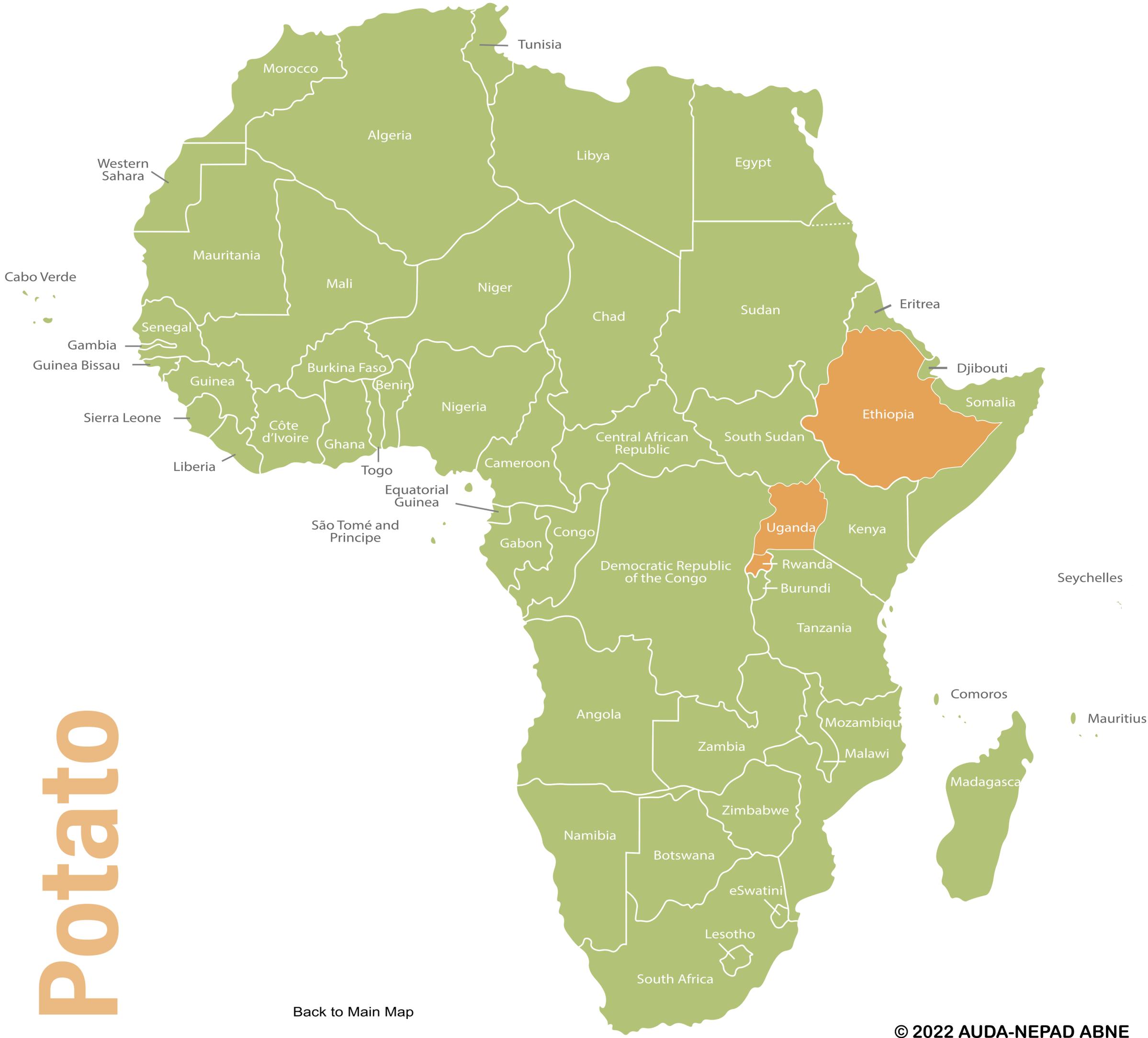
# GM Crops Developed in Africa



Sorghum

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# GM Crops Developed in Africa



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# GM Crops Developed in Africa



# Sweet Potato

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# GM Crops Developed in Africa



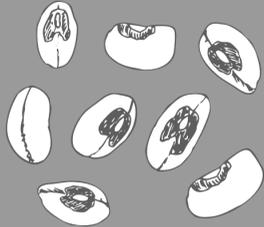
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# GM Crops Developed in Africa

## Burkina Faso

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Crop / Event	Trait	Institution Involved	Stage of Development
<p><b>Cowpea</b></p> 	<p>Insect resistant - Maruca resistant</p>	<p>INERA, AATF</p>	<p>Multi-location trials</p>
<p><b>Rice</b> (Gene edited)</p> 	<p>Bacterial blight disease resistant</p>	<p>INERA</p>	<p>Greenhouse Trials</p>
<p><b>Cotton</b></p> 	<p>Insect-resistant</p>	<p>INERA, Monsanto-Bayer</p>	<p>Commercial release (suspended)</p>

# GM Crops Developed in Africa

## Cameroon

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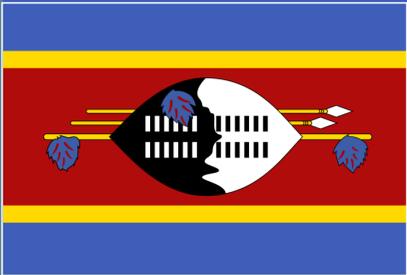


Crop / Event	Trait	Institution Involved	Stage of Development
<p><b>Cotton</b></p> <p>(GHB614 x T304-40 x GHB119)</p> 	<p>Insect resistance - Lepidopteran pests / Herbicide Resistant - Glyphosate</p>	<p>Bayer Crop Sc.</p>	<p>Application for Environmental Release</p>

# GM Crops Developed in Africa

## Eswatini

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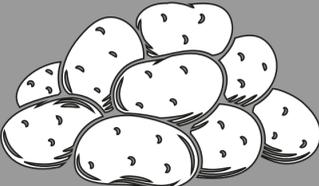
<b>Crop / Event</b>	<b>Trait</b>	<b>Institution Involved</b>	<b>Stage of Development</b>
<p><b>Cotton</b> (Event 1)</p> 	<p>Insect resistance - Lepidopteran pests - cotton bollworm, Pink Bollworm and Spotted Bollworm</p>	<p>Swaziland Cotton Board, JK Agri Genetics</p>	<p>Approved for commercial release</p>

# GM Crops Developed in Africa

## Ethiopia

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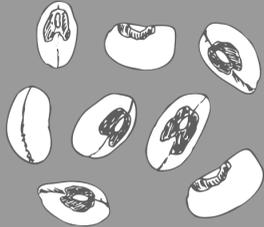
Crop / Event	Trait	Institution Involved	Stage of Development
<b>Cotton</b> (Event 1) 	Insect resistance to Lepidopteran pests - cotton bollworm, Pink Bollworm and Spotted Bollworm	EIAR, JK Agri Genetics - India	Approved for commercial release
<b>Maize</b> 	WEMA, Drought tolerance + Lepidopetran Insect Resistance	EIAR, AATF	Confined Field Trials (CFT)
<b>Potato</b> 	Late blight resistant	EIAR, AATF	Confined Field Trials (CFT)

# GM Crops Developed in Africa

## Ghana

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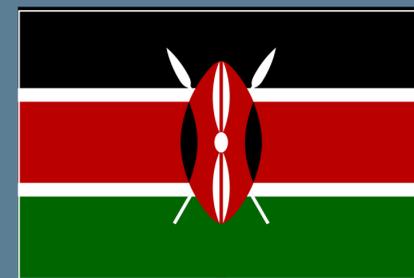


Crop / Event	Trait	Institution Involved	Stage of Development
<p><b>Cowpea</b></p> 	<p>Insect resistant - Maruca resistant</p>	<p>AATF, SARI</p>	<p>Approved for environmental release</p>
<p><b>Rice</b></p> 	<p>Nitrogen-use, water- efficient and salt- tolerance</p>	<p>CRI, AATF, IITA</p>	<p>Confined Field Trials (CFT)</p>

# GM Crops Developed in Africa

## Kenya

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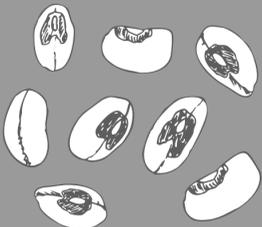
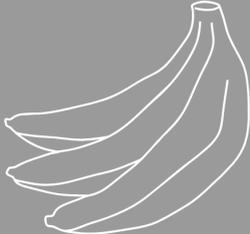
Crop / Event	Trait	Institution Involved	Stage of Development
 <p><b>Cotton</b> (Mon 15985)</p>	Resistance to lepdopteran pests - cotton bollworm, pink bollworm, tobacco budworm	KALRO, Monsanto	Approved for general release
 <p><b>Flowers</b> (Gypsophila paniculata)</p>	Pink colloration of petals	Danziger - Dan Flower Farm, Israel	Review for environmental release
 <p><b>Maize</b> (Mon 87460)</p>	Drought tolerance	AATF, CIMMYT, KALRO	Confined Field Trials (CFT)
 <p><b>Maize</b> (Mon 810)</p>	Resistant to Lepidoptera - Corn Borer	AATF, CIMMYT, KALRO	Conditional approval for environmental release
 <p><b>Maize</b> (Mon 87460 x Mon 810)</p>	Drought tolerance + insect resistance	AATF, CIMMYT, KALRO	Confined Field Trials (CFT)
 <p><b>Cassava</b></p>	Brown streak virus disease Introgression into CMD tolerant background materials	KALRO, Danforth Plant Science Center	Confined Field Trials (CFT)
 <p><b>Cassava</b></p>	Cassava Brown streak virus (CBSV) and African Cassava Mosaic Virus (ACMV)	Masinde Muliro University of Science and Technology	Confined Field Trials (CFT)
 <p><b>Banana</b></p>	Banana bacterial - Xanthomonas Wilt (BXW) resistance	KAPRO, IITA	Confined Field Trials (CFT)
 <p><b>Sorghum</b></p>	Enhanced pro-Vit. A levels, Bio-available Zinc and Iron	African Harvest, Pioneer Hi-Bred, a Dupont Business and KALRO	Confined Field Trials (CFT)
 <p><b>Sweet Potato</b></p>	siRNA resistance to Sweet potato virus disease	KALRO, Danforth Plan Science Center	Confined Field Trials (CFT)

# GM Crops Developed in Africa

## Malawi

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Crop / Event	Trait	Institution Involved	Stage of Development
<b>Cowpea</b> 	Insect resistant - Maruca resistant	LUNAR, DARS, AATF	Confined Field Trials (CFT)
<b>Cotton</b> (Mon 15985) 	resistance to lepidopteran pests-cotton bollworm, pink bollworm, tobacco dudworm	LUNAR, DARS, Monsanto, Quton	Approved for general release
<b>Banana</b> 	Bunchytop virus resistance	DARS, Queensland University of Technology	Confined Field Trials (CFT)

# GM Crops Developed in Africa

## Mozambique

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Crop / Event	Trait	Institution Involved	Stage of Development
<p><b>Maize</b> (Mon 87460 x Mon 810)</p> 	<p>Drought tolerance + Lepidopetran Insect Resistance</p>	<p>AATF, IIAM</p>	<p>Confined Field Trials (CFT)</p>

# GM Crops Developed in Africa

## Nigeria

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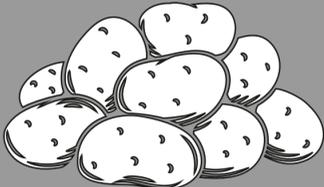
Crop / Event	Trait	Institution Involved	Stage of Development
 <p><b>Cotton</b> (Mon 15985)</p>	<p>Resistance to lepdopteran pests - cotton bollworm, pink bollworm, tobacco budworm</p>	<p>Monsanto Agriculture Nigeria Ltd</p>	<p>Approved for commercial release and variety registration</p>
 <p><b>Sorghum</b></p>	<p>Biofortified (bioavailability of Iron, Zinc, and increase in protein and vitamin A)</p>	<p>Africa Harvest, Pioneer Hi-Bred, a Dupont Business, IAR and NABDA</p>	<p>Confined Field Trials (CFT)</p>
 <p><b>Cowpea</b></p>	<p>Insect resistance - Maruca Resistant</p>	<p>AATF, IAR</p>	<p>Approved for commercial release and variety registration</p>
 <p><b>Cassava</b></p>	<p>Biofortified (increased iron content)</p>	<p>CFT</p>	<p>Confined Field Trials (CFT)</p>
	<p>Mosaic virus resistant</p>	<p>CFT</p>	<p>Confined Field Trials (CFT)</p>
	<p>Brown streak virus resistance</p>	<p>CFT</p>	<p>Confined Field Trials (CFT)</p>
	<p>Biofortified (increased level of beta-carotene, provitamin A)</p>	<p>CFT</p>	<p>Confined Field Trials (CFT)</p>
 <p><b>Rice</b></p>	<p>Nitrogen-use, water-efficient and salt-tolerance</p>	<p>NCRI, Badeggi</p>	<p>Confined Field Trials (CFT) Permit granted</p>
 <p><b>Maize</b> (NK 630 x Mon 810)</p>	<p>Herbicide tolerance (Gylyphosate and Insect Resistant - Lepidopterans)</p>	<p>Monsanto Agriculture Nigeria Ltd</p>	<p>Confined Field Trials (CFT)</p>

# GM Crops Developed in Africa

## Rwanda

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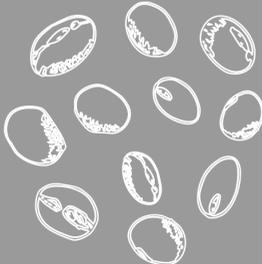
Crop / Event	Trait	Institution Involved	Stage of Development
<p><b>Cassava</b></p> 	<p>Resistance to Cassava Brown Streak Disease and Cassava Mosaic Disease</p>	<p>Rwanda Agriculture and Animal Resources Development Board (RAB)</p>	<p>Confined Field Trials (CFT)</p>
<p><b>Potato</b></p> 	<p>Late blight resistant</p>		<p>Confined Field Trials (CFT)</p>

# GM Crops Developed in Africa

## South Africa

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Crop / Event	Trait	Institution Involved	Stage of Development
<p><b>Maize</b></p> 	<p>Insect-resistant, and double stack (herbicide-tolerant and insect-resistant)</p>		
<p><b>Soybean</b></p> 	<p>(herbicide tolerant)</p>		
<p><b>Cotton</b></p> 	<p>Insect-resistant, and double stack (herbicide-tolerant and insect-resistant)</p>		

# GM Crops Developed in Africa

## Sudan

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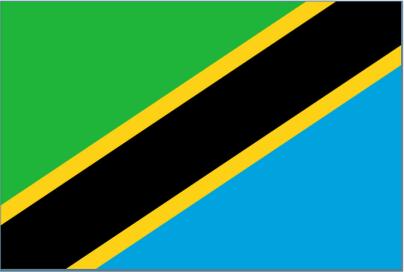


Crop / Event	Trait	Institution Involved	Stage of Development
<p><b>Cotton</b></p> 	<p>Insect-resistant</p>	<p>China</p>	<p>Commercial releases</p>

# GM Crops Developed in Africa

## Tanzania

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Crop / Event	Trait	Institution Involved	Stage of Development
<p><b>Maize</b> (Mon 87460 x Mon 810)</p> 	<p>Drought tolerant WEMA</p>	<p>AATF, COSTECH</p>	<p>Confined Field Trials (CFT) halted due to admin issues</p>

# GM Crops Developed in Africa

## Uganda

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Crop / Event	Trait	Institution Involved	Stage of Development
 <b>Cotton</b>	Insect resistance + Herbicide tolerance	NARO, Monsanto	Multi-location trials completed
 <b>Banana</b>	Banana bacterial - Xanthomonas Wilt (BXW) resistance	NARO, IITA	Multi-locational trials
	Banana parasitic nematode resistance	NARO, University of Leeds	Confined Field Trials (CFT) Confined Field Trials (CFT)
	Nutrition enhancement (Fe and Pro-Vitamin A)	KAPRO, IITA	Latest staggered planting done on-going
	Black sigatoka resistance	NARO, AATF	Confined Field Trials (CFT) completed
 <b>Cassava</b>	Cassava mosaic disease virus	NARO, DDPSC	Confined Field Trials (CFT) completed
	Cassava mosaic disease virus, cassava brown streak disease virus resistance	NARO, DDPSC	Multi-locational trials
 <b>Sweet Potato</b>	Weevil resistance		Green House trials (GHT) completed
 <b>Maize</b> (Mon 87460 x Mon 810)	Drought tolerance + insect resistance	NARO, AATF, Monsanto, CIMMYT	Multi-locational trails
 <b>Maize</b> (Mon 810)	Resistant to Lepidoptera - Corn Borer	NARO, AATF	Confined Field Trials (CFT) completed
 <b>Maize</b> (Mon 87460)	Drought tolerance	NARO, AATF	Confined Field Trials (CFT) completed
 <b>Rice</b>	Nitrogen Use Efficiency / Water Use Efficiency	NARO, AATF, Arcadia Biosciences	Confined Field Trials (CFT)
 <b>Soybean</b>	Herbicide tolerance	Makerere University and MSU	Green House trials (GHT)
 <b>Potato</b>	Disease resistance	NARO, CIP	CFT