Adapting Agriculture to Climate Change

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2nd June 2016, University of Birmingham
Outline

• Project Overview
• Activities
• Take home resources
Outline

• Project Overview

• Activities

• Take home products
A portfolio of crop wild relatives are collected, protected and prepared in a form that plant breeders can readily use to produce varieties adapted to future climates.
<table>
<thead>
<tr>
<th>Crop Common Name</th>
<th>Crop Scientific Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oat</td>
<td>Avena sativa</td>
</tr>
<tr>
<td>Bambara Groundnut</td>
<td>Vigna subterraneana</td>
</tr>
<tr>
<td>Common Bean</td>
<td>Phaseolus vulgaris</td>
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<tr>
<td>Pigeonpea</td>
<td>Cajanus cajan</td>
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<tr>
<td>Chickpea</td>
<td>Cicer arietinum</td>
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<tr>
<td>Cowpea</td>
<td>Vigna unguiculata</td>
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<tr>
<td>Carrot</td>
<td>Daucus carota</td>
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<tr>
<td>Eggplant</td>
<td>Solanum melongena</td>
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<tr>
<td>Finger Millet</td>
<td>Eleusine coracana</td>
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<tr>
<td>Faba Bean</td>
<td>Vicia faba</td>
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<tr>
<td>Sunflower</td>
<td>Helianthus annuus</td>
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<tr>
<td>Barley</td>
<td>Hordeum vulgare</td>
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<tr>
<td>Sweet Potato</td>
<td>Ipomoea batatas</td>
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<tr>
<td>Grasspea</td>
<td>Lathyrus sativus</td>
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<tr>
<td>Lentil</td>
<td>Lens culinaris</td>
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<tr>
<td>Lima Bean</td>
<td>Phaseolus lunatus</td>
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<tr>
<td>Apple</td>
<td>Malus domestica</td>
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<tr>
<td>Alfalfa</td>
<td>Medicago sativa</td>
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<tr>
<td>Banana and Plantain</td>
<td>Musa acuminata and M. balbisiana</td>
</tr>
<tr>
<td>Pearl Millet</td>
<td>Pennisetum glaucum</td>
</tr>
<tr>
<td>Pea</td>
<td>Pisum sativum</td>
</tr>
<tr>
<td>Potato</td>
<td>Solanum tuberosum</td>
</tr>
<tr>
<td>Rice</td>
<td>Oryza sativa and O. glaberrima</td>
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<tr>
<td>Rye</td>
<td>Secale cereal</td>
</tr>
<tr>
<td>Sorghum</td>
<td>Sorghum bicolor</td>
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<tr>
<td>Wheat</td>
<td>Triticum aestivum</td>
</tr>
<tr>
<td>Vetch</td>
<td>Vicia sativa</td>
</tr>
</tbody>
</table>

- 29 crop genepools
Initial Partners

- Kew, Royal Botanic Gardens
- Millennium Seed Bank Partnership
- CIAT, Centro Internacional de Agricultura Tropical
- Crop Wild Relatives
- University of Birmingham
- CROP Trust
- NORAD, Norwegian Agency for Development Cooperation
Crop Wild Relatives

1 Research

- What are the CWR?
- Where are they found?
- Where do they need collection?
Crop Wild Relatives

1. Research

2. Collecting

Herbarium Vouchers

Data

Seeds

New Crop Varieties
Crop Wild Relatives

1 Research

2 Collecting

3 Conservation

New Crop Varieties

Collecting

Research

Information
Crop Wild Relatives

1 Research

2 Collecting

3 Conservation

4 Use

New Crop Varieties

- Drought tolerance
- Salt tolerance
- Heat tolerance

- Disease resistance
- Widening the genetic base of the crop
Crop Wild Relatives

CWR Project

Year

1 Research
2 Collecting
3 Conservation
4 Use
5 Information

New Crop Varieties

Collecting 2016
Outline

• Project Overview
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CWR Occurrence Database

• Digital data
• Herbarium data
• Genebank data
• Expert datasets
CWR Gap Analysis

Where are CWR distributed?
CWR Gap Analysis

Where are CWR distributed?

Where are collections needed?
CWR Gap Analysis – Global Collecting Need
Partners
Collecting Guides

Adapting agriculture to climate change: collecting, protecting and preparing crop wild relatives

Costa Rica

Seed Collecting Guide
Collecting Guides – Species Profile

**POACEAE**

*Aegilops cylindrica* Host

**Secondary genuspool of Triticum aestivum subsp. compactum**

**HABIT:** Annual, densely tufted, 20-45 cm high, erect or procumbently ascending.

**LEAVES:** Linear, alternate, glabrous or sparsely hairy, up to 12 cm long, 3-5 mm wide.

**INFLORESCENCES:** Spikelets 6-11 cm long (excluding the awns), cylindrical with 1-2 vestigial spikelets at the base; rachis breaking up at maturity. Forti-foliate spikelets 4-6; glumes of lateral spikelet 7-9 mm long (to the base of the apical spike), 2-toothed; 1 of the teeth short and blunt, the other produced as an awn up to 18 mm long, awns of terminal spikelet shorter than the spike.

**Habitat:**

Rutaceous and disturbed sites, e.g., waste ground, cultivated areas, road sides, dry slopes, grasslands.

**Distribution:**

Europe: central, southeastern, and eastern; Asia-tropical: Soviet far east, Soviet Middle Asia, Caucasus, and western Asia; Asia-tropical: India, throughout USA.

**Altitude:**

100 - 1750 m

**Aegilops cylindrica**

- Glumes on spikelets about 3-6 cm long (shorter than the length of the spikelet).

**May be confused with:**

- *Aegilops chalca*.

**References:**

Training
Training

https://www.youtube.com/watch?v=ziYP0RAqtHQ
Seed Collecting
Collections

CWR Project collections at the MSB to date (30th April 2016) - Crop genepool breakdown
Pre-Breeding - Aubergine

http://eggplantprebreeding.upv.es/
Outline

• Project Overview
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Take home resources

CWR Inventory
CWR Occurrence Database
CWR Atlas
Pre-breeding Data
Other Resources
- Gap Analysis Results
- Expert Evaluation
- Collecting Guides
- Publications
- Tools


Find out more

www.cwrdiversity.org

CropWildRelatives@Kew.org