
Crop Wild Relatives

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CGN event 'Genetic Diversity', 15 March 2023

Workshop: Complementarity of nature conservation with genetic resources conservation: crop wild relatives and autochthonous trees



Origin of Agriculture

~10,000 years ago



Hunter/gatherer society



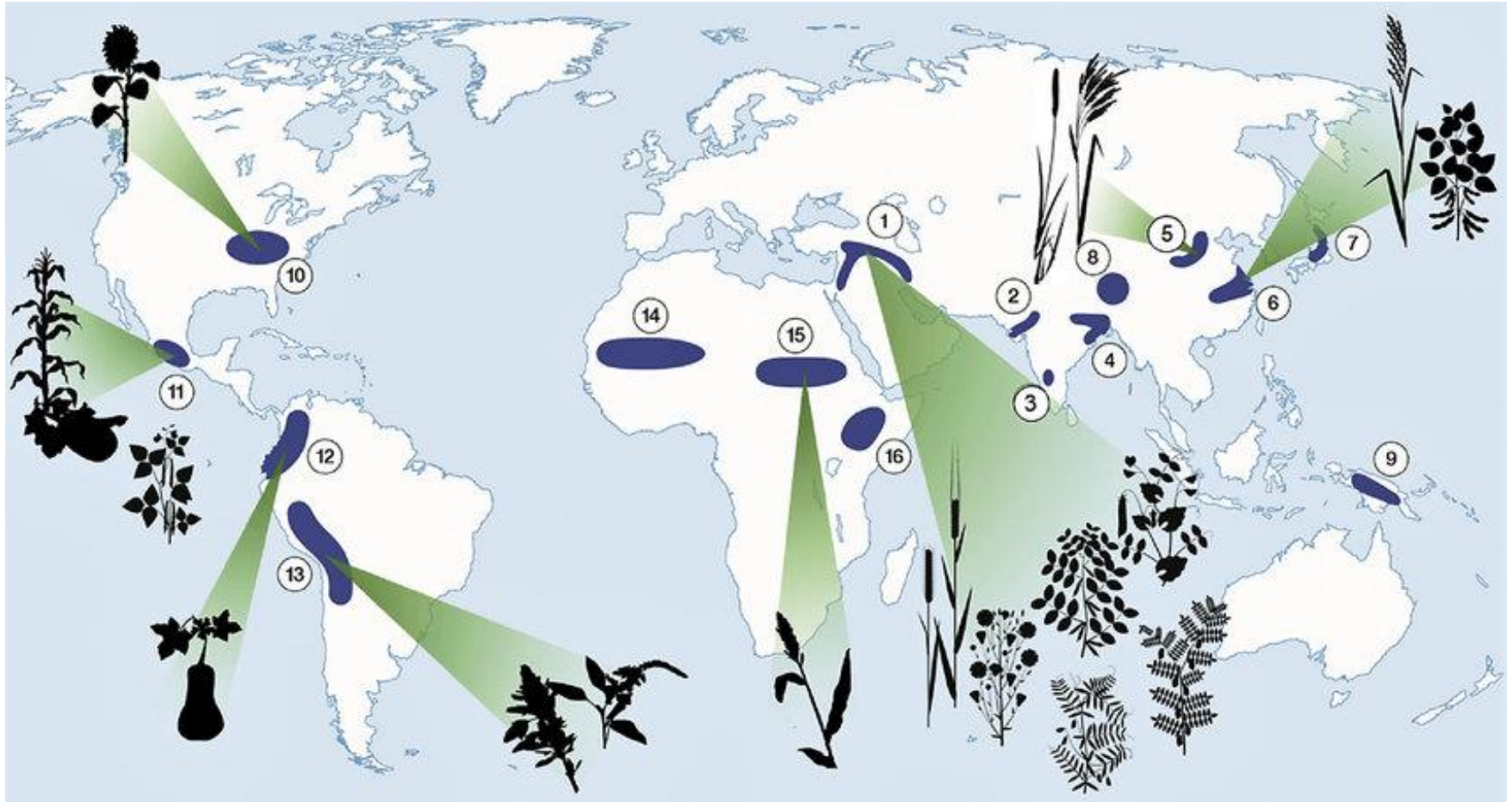
Agricultural society

Domestication of wild species

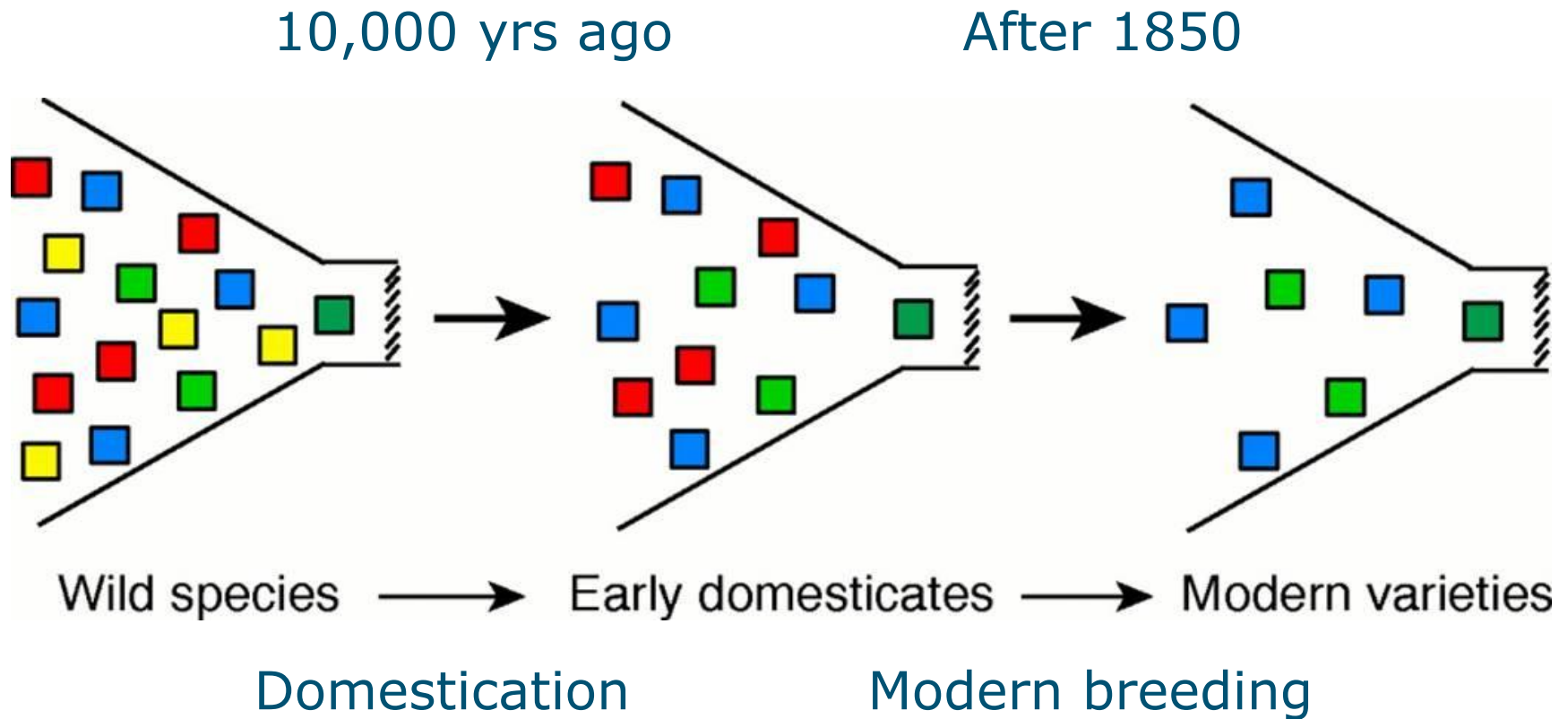
- Local adaptation
- Rapid, synchronized germination
- Non-shattering of seeds
- Delayed bolting
- Loss of thorns/spines
- Improved taste



Domestication areas



Bottlenecks of genetic variation

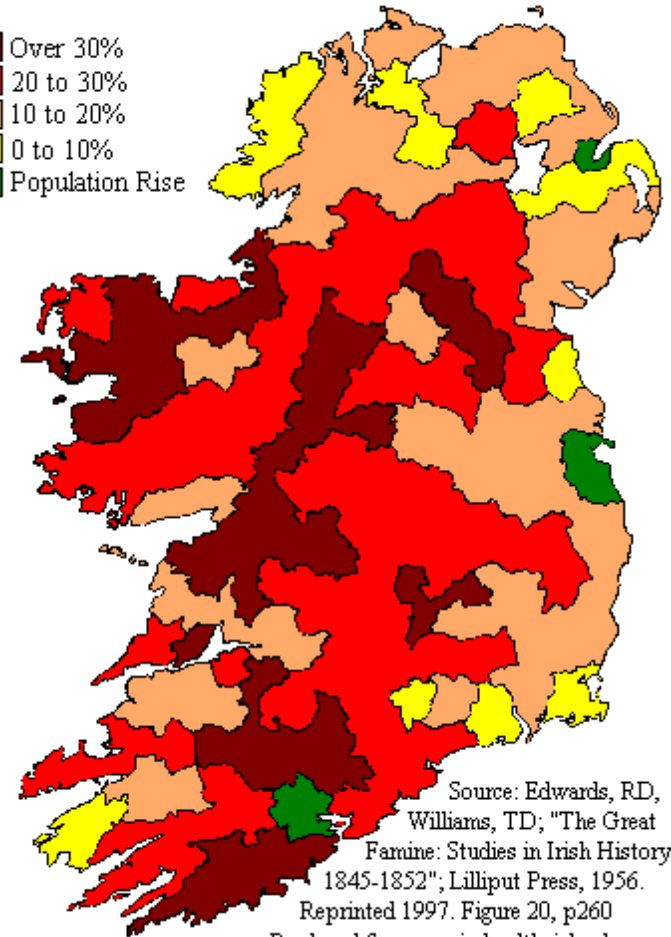
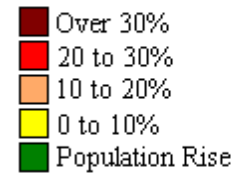


Potential effects of genetic uniformity

- Irish potato famine
 - Genetically uniform potato fields
 - Outbreak of potato blight
 - Harvests largely destroyed
 - 1 million people died
 - 2 million people emigrated



Population Fall in Ireland 1841-1851



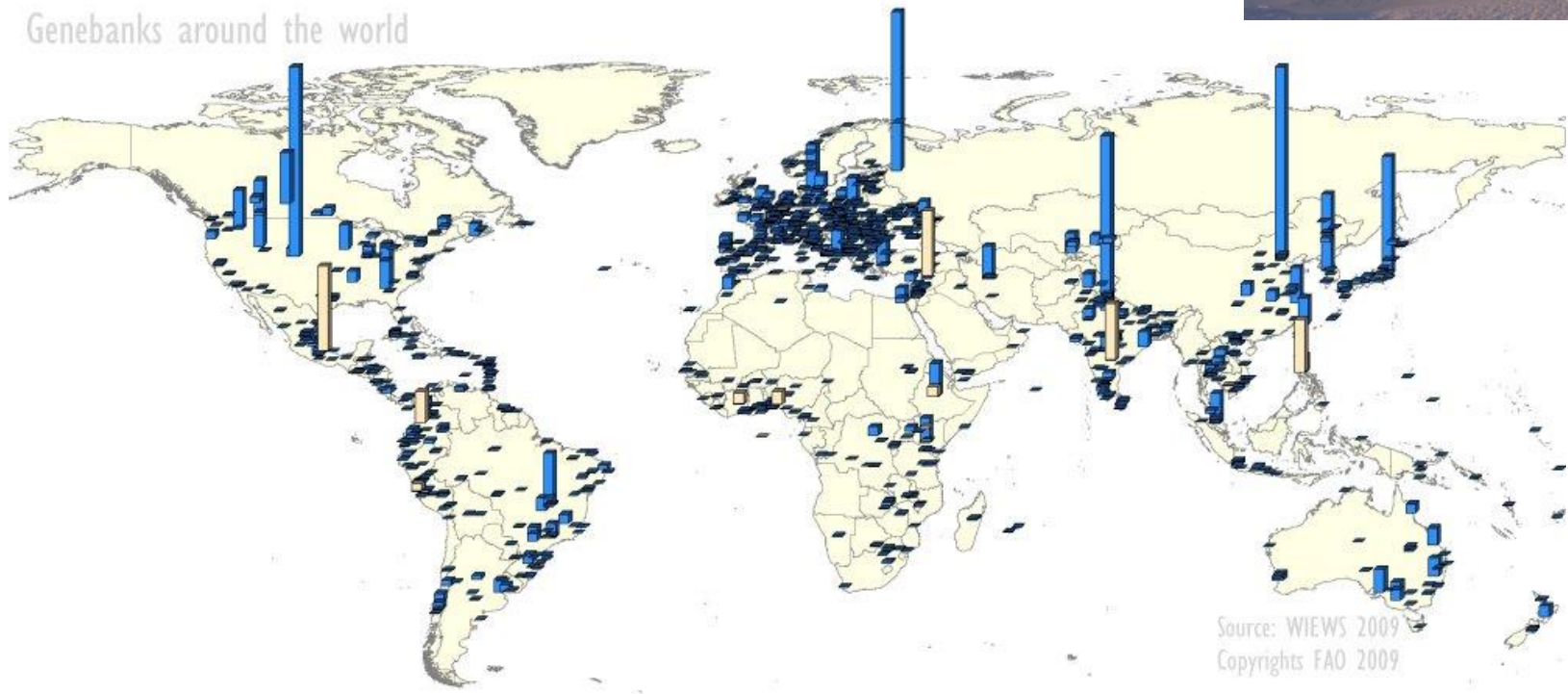
Source: Edwards, RD,
Williams, TD; "The Great
Famine: Studies in Irish History
1845-1852"; Lilliput Press, 1956.
Reprinted 1997. Figure 20, p260
Produced for www.irelandtheisland.com

Network of gene banks

- ~1750 gene banks world-wide
- ~7.4 million accessions



Genebanks around the world



Crop wild relatives

- Underrepresentation in genebanks
 - Preference for cultivated material in plant breeding
 - Distributions areas often far away
 - Maintenance in genebanks often difficult
 - Increased complexity laws and regulations
- Increased importance for crop improvement
 - Rich source of genetic diversity
 - Cultivated gene pool more and more depleted
 - Contribution to food security



CWR in the Netherlands

Crop group	Common	Red List	Total
Cereals	18	5	23
Vegetables	34	17	51
Fruits	20	4	24
Oil crops	9		9
Herbs	5	4	9
Leguminous crops	15	7	22
Sugar crops	1		1
Others	59	16	75
Total	161	53	214



CWR website (www.cwrnl.nl)



Home

CWR per crop

CWR by English name

CWR by botanical name

About CWRnl

Accessibility of CWR



Crop Wild Relatives (CWR) in the Netherlands

Cultivated crops produce the main part of our daily food. Changes in environmental conditions, for example as a result of the changing climate or the appearance of new diseases, may endanger food production and thus call for better adapted crop varieties. Therefore, our food security relies on the availability of the necessary traits for crop improvement, which often can no longer be found in the cultivated gene pool. Fortunately, wild plant species related to cultivated crops (CWR) constitute a rich source of potentially useful traits, which can be introduced in cultivated crops through plant breeding. Because the continued existence of many wild plant species is uncertain due to influences such as pollution, urbanisation and climate change, it is of the utmost importance that CWR do not get lost and remain available for crop improvement. Prior to the development of protective measures, one first has to know which CWR are actually occurring within national boundaries. For the economically most important agricultural and horticultural crops, CWRnl presents the results of a CWR inventory in the Netherlands.