

Building Virtual Reference for Seed Identification



<https://www.idseed.org/>



<https://analyzeseeds.com/>

Webinar July 13, 2021

Presenters

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Canadian Food
Inspection Agency

Agence canadienne
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Identification Technology Program

Animal and Plant Health Inspection Service (APHIS)

U.S. Department of Agriculture (USDA)



Overview

- Specimen selection and image plan
(Ruoqing Wang)
- Examples of seed/fruit imaging on a toxic-seed-ID tool for the FBI
(Lindsey Seastone)
- Imaging techniques and troubleshooting
(Madeline Maher)
- Q&A



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Building Virtual Reference for Seed Identification

Specimen selection and image plan

Dr. Ruoqing Wang

Seed Science & Technology Section, Saskatoon Laboratory
Canadian Food Inspection Agency (CFIA)
July 13, 2021



Canada 

Principles of Specimen Selection

Virtual/image reference:

- True to the plant identity (verified specimens)
- Representation
- Reference function

ISMA image protocol

https://www.idseed.org/authors/details/protocol_for_imaging_seed_features.html



Ensure the identify of seeds

- Expertise required, e.g.,



Field Collection

Verified plant species



Herbarium

Verified seed specimens



Laboratory or Authority

Specialist verified materials

Specimen Representation

Image of seed features:

- **Mature seeds (common use)**
- Immatures seeds (special needs, shall be labeled)
- Deformed seeds (Special needs, shall be labeled)

Mature Seeds



Malva neglecta

Immature Seeds



Cuscuta spp.

Deformed Seeds



Silene dioica

Specimen Representation

Typical features:

- **Single seed**
- **Close up**

One side



Cuscuta spp.



Atriplex hortensis

Three sides



Apium graveolens var. *dulce*



Setaria pumila subsp. *pumila*

Two sides

Specimen Representation

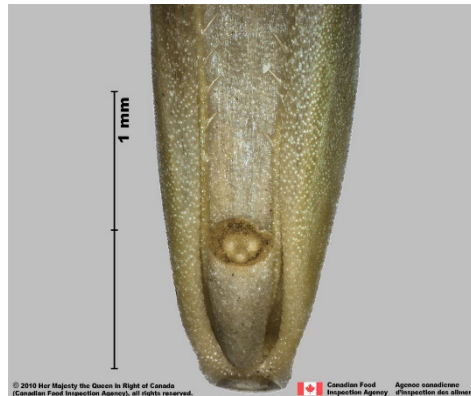
Typical features:

- Single seed
- **Close up**

Labeled
close-up



ageratum conyzoides



Bromus secalinus



Aegilops cylindrica

Specimen Representation

Feature variations:

- Group seeds to show variations such as color, size, and shape.



Papaver somniferum



Anthriscus sylvestris

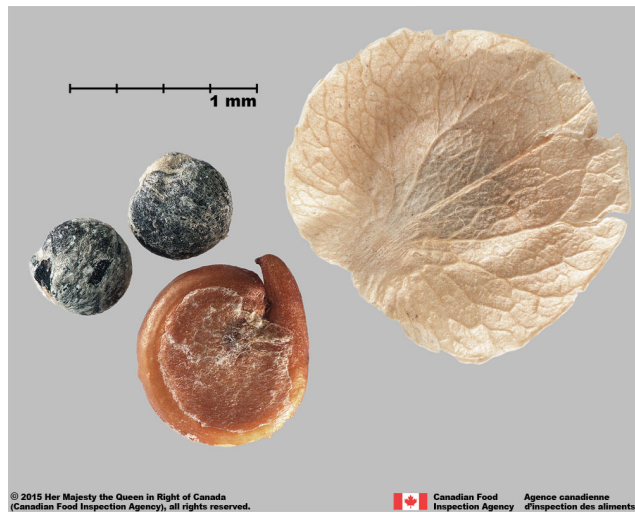


Picris echioides

Specimen Representation

Diversity of botanical form:

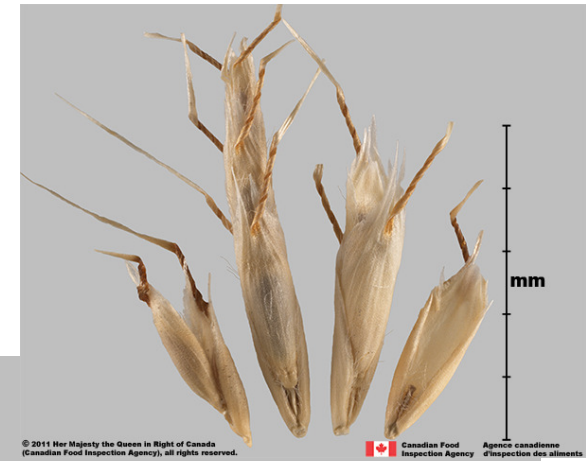
- Dispersal and botanical forms
- Dimorphism



Atriplex hortensis



Aegilops cylindrica



Danthonia spicata

Image presentation: File name

Image set up:

- Name:
 - **Scale: scale bar**
 - Labels: feature indication
- **Scientific name** + notes
- Background: white, black and grey
- Copyright statement & logo

File names of an image:

Species name + Notes (spec + serial number + Author)

Poa alpine-Floret-01-NSH



Poa alpine

Image presentation: Background

Image set up:

- Name:
Scientific name + notes
- **Background:** white, black and grey
- Scale: scale bar
- Labels: feature indication



Avena sativa fatuoid



Rumex maritimus



Bothriochloa barbinodis

Image presentation

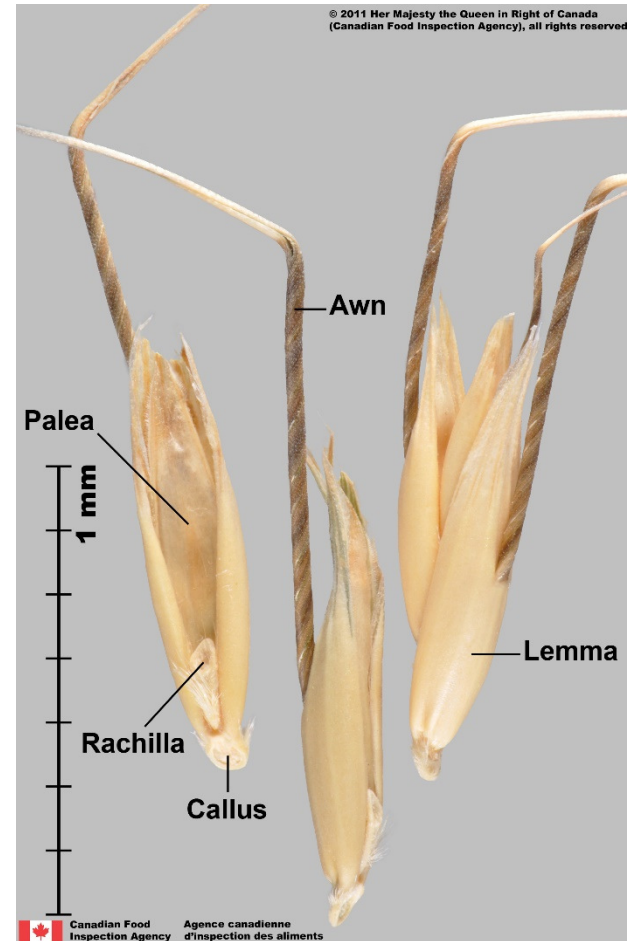
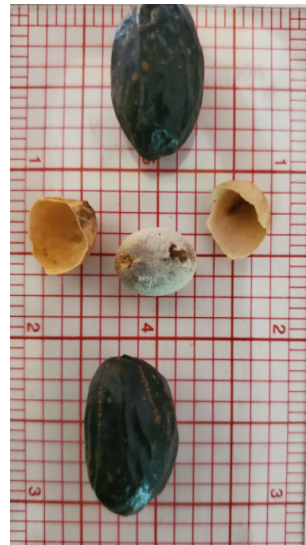
Image set up:

- Feature labelling
- **Scale bar or a reference**
- Copyrights



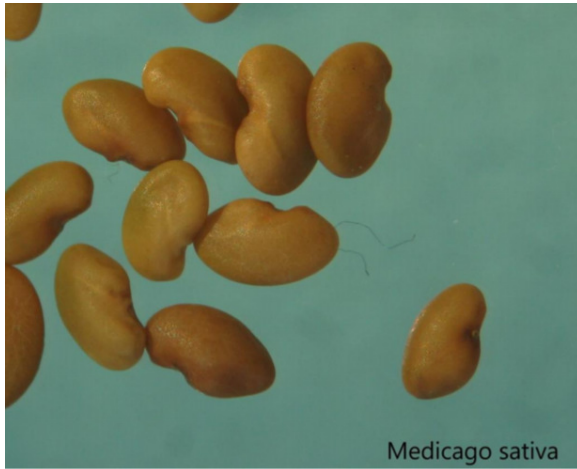
2 mm

Scale bar



Avena sativa fatuoid

Avoid



Medicago sativa

Seeds touch each other



Cuscuta spp.

unnecessary arrangement



Setaria pumila subsp. *pumila*

What is
wrong
here?

Question?



Acknowledgement

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- Authors for the imaging protocol published in ISAM website
- *QUAD Digital Identification Tool Team

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Thank You