



Identification Features of Fabaceae & Application to Selected Species April 30th , 2018

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Learning objectives for this course

1. Become familiar with the structures and features of the Fabaceae family that analysts use to gather information about their identity.
2. Know how to apply botany knowledge to distinguish selected species.

Introduction to *Fabaceae*

Photo by: Sdecosta; <https://shovelingwithsamantha.wordpress.com/2015/01/13/raising-alfalfa-seed-part-1-the-difference/>

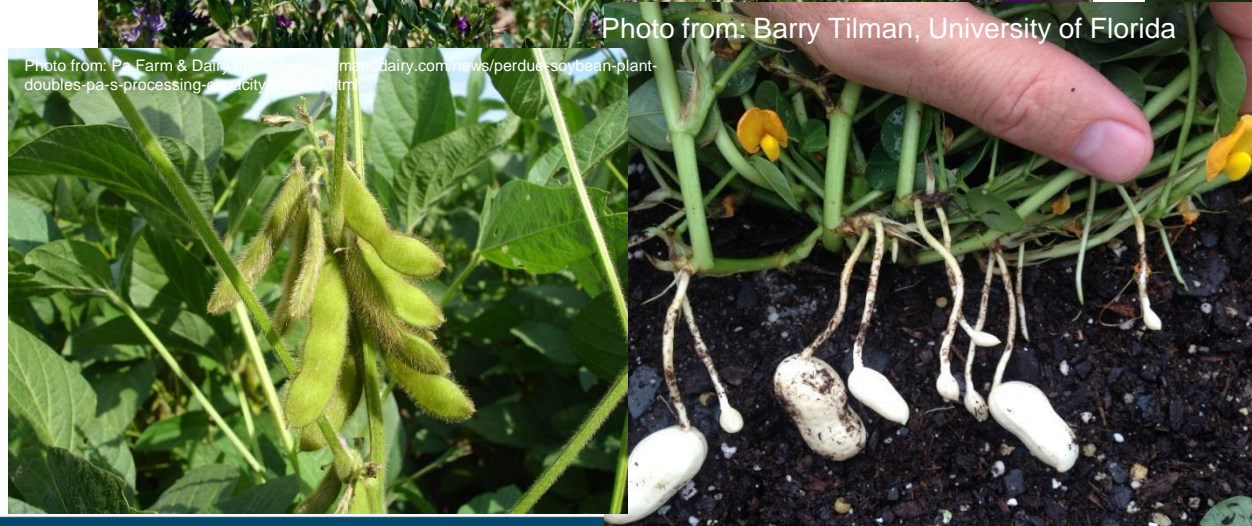


Photo from: J&L Candles



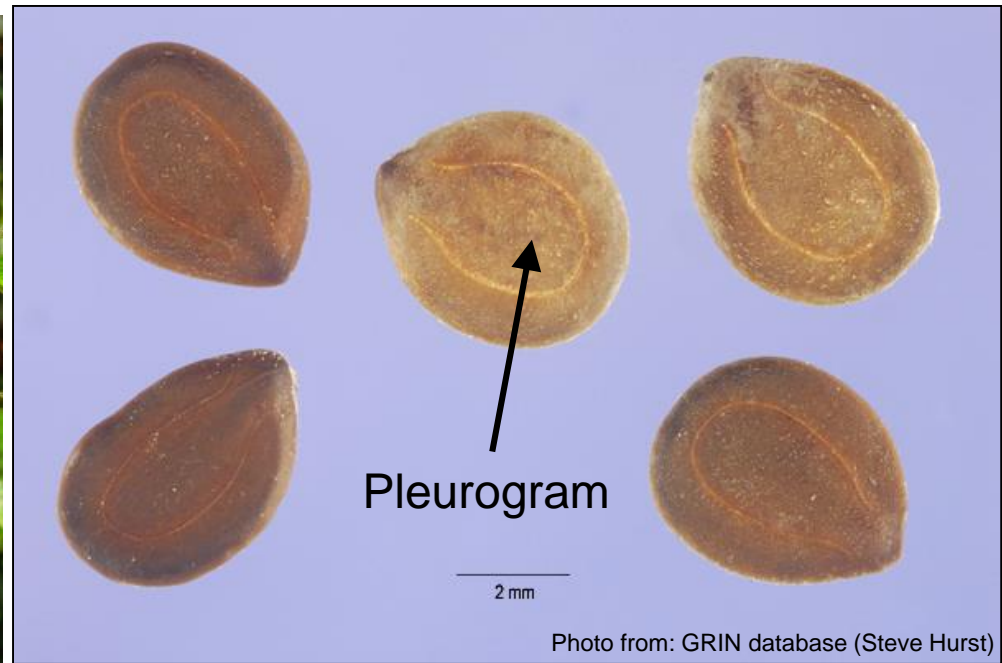
Photo from: Barry Tilman, University of Florida

Photo from: P Farm & Dairy www.pfarmanddairy.com/news/perdue-soybean-plant-trip/
doubles-pa-s-processing-capacity



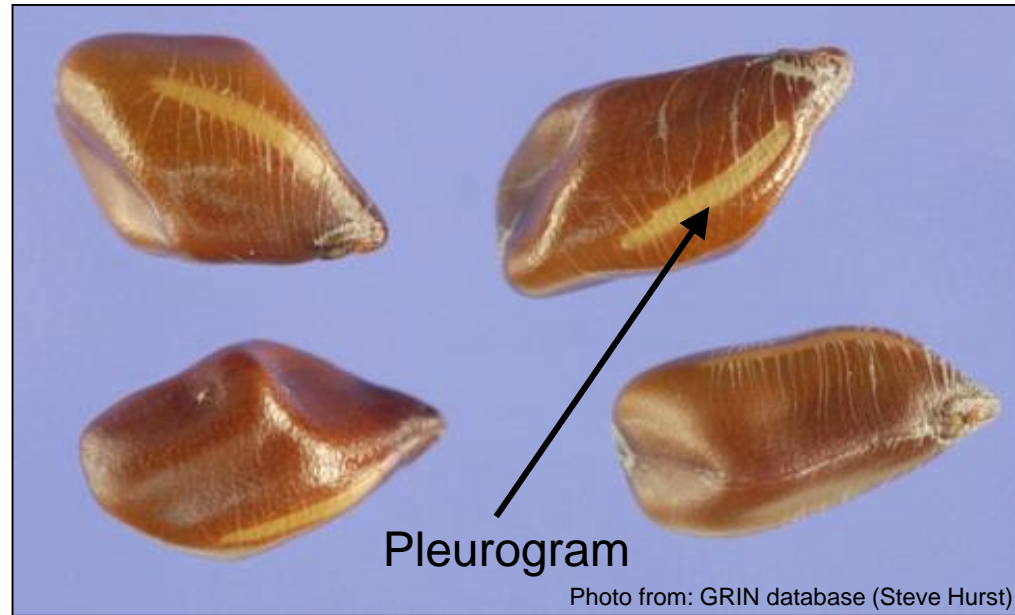
JonathonVanBuren@gmail.com

The Three Subfamilies of *Fabaceae*: *Mimosoideae*



The Three Subfamilies of *Fabaceae*:

Caesalpinoideae



The Three Subfamilies of *Fabaceae*:

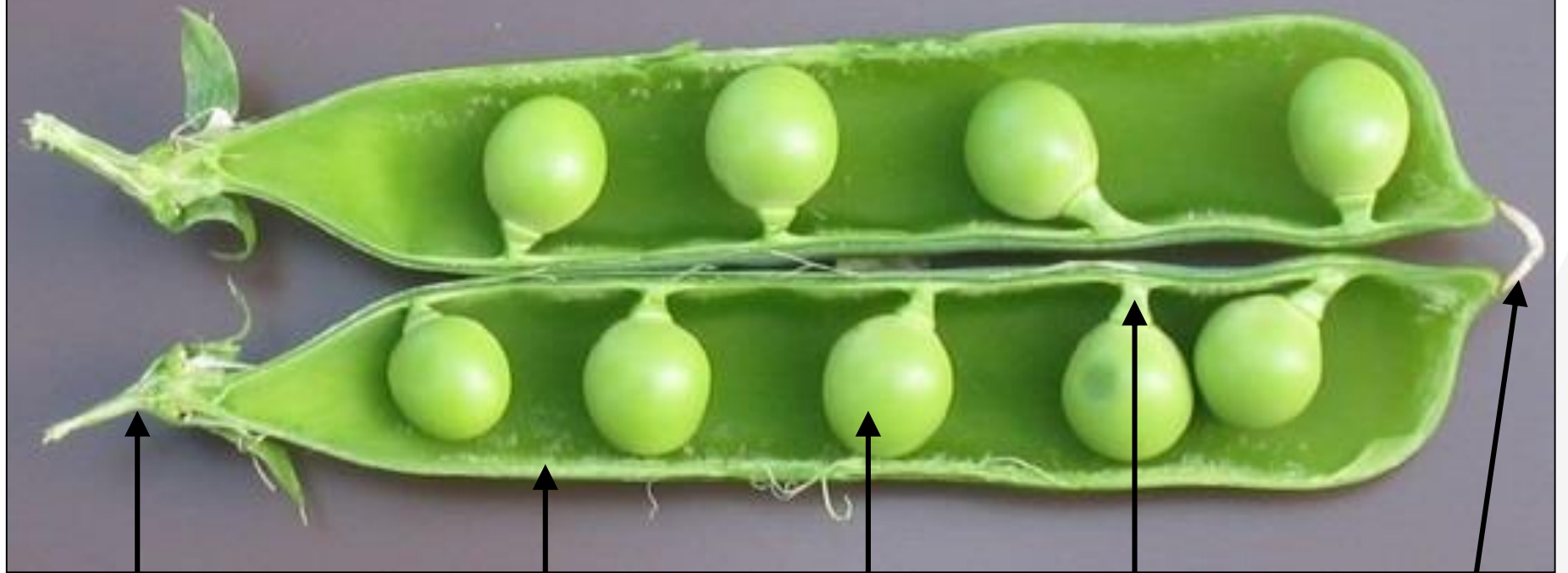
Faboideae

Photo from: Wikimedia commons



Fabaceae Legume and Seeds

Photo from: Centre for Integrative Legume Research, University of Queensland



Stem and
flower
remnant

Fruit /
Ovary Wall

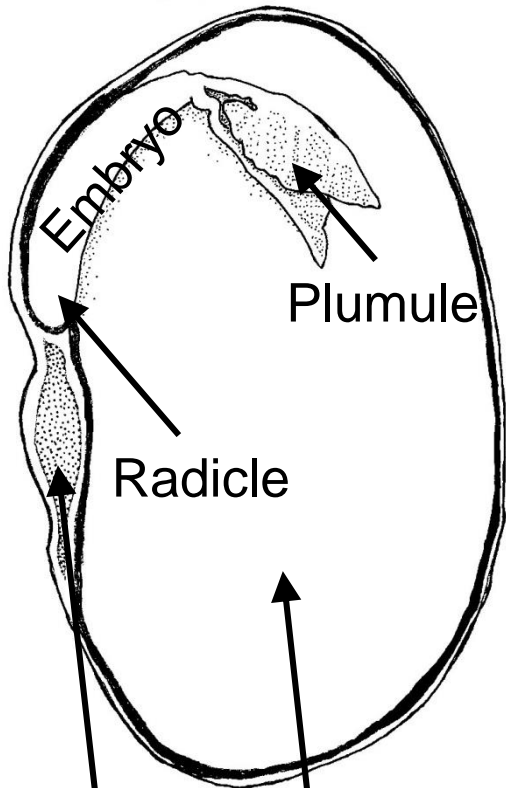
Seed

Funiculus

Style
Remnant

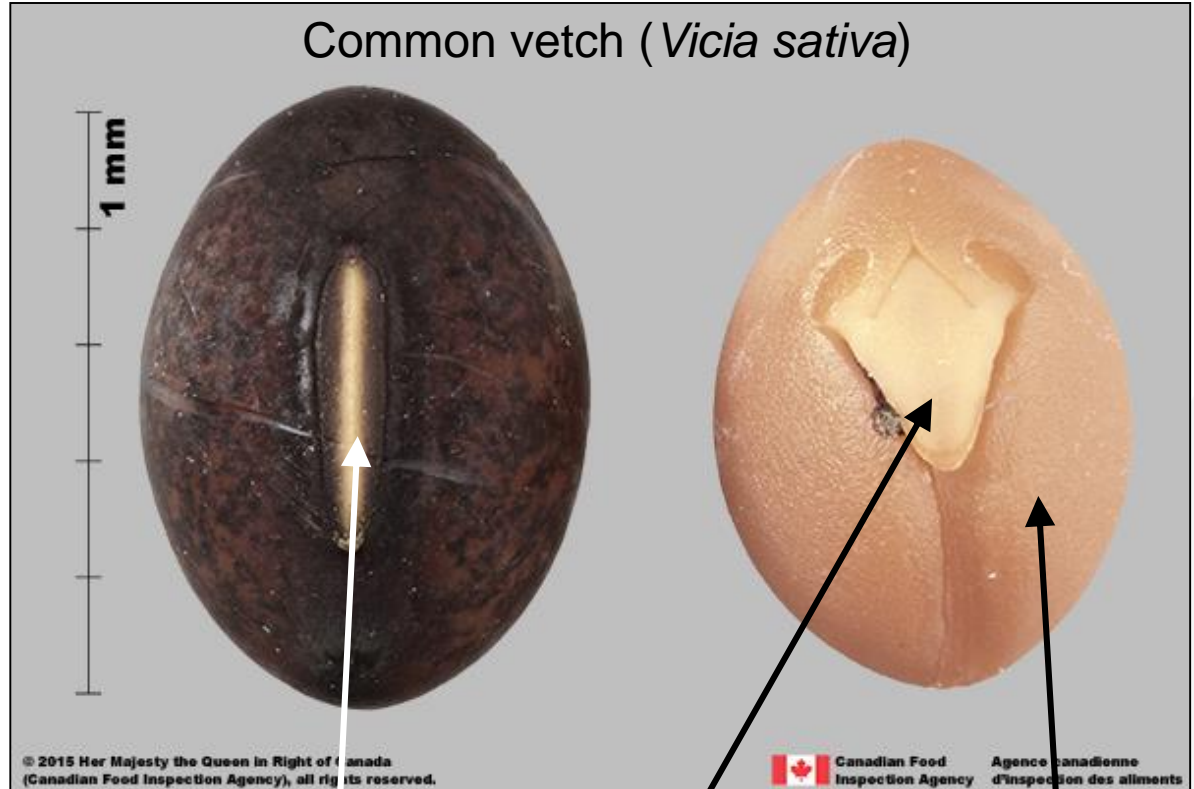
Fabaceae Seed Anatomy

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Hilum Cotyledon

Canadian Food Inspection Agency Agence canadienne d'inspection des aliments



Common vetch (*Vicia sativa*)

1 mm

Hilum

Radicle

Cotyledon

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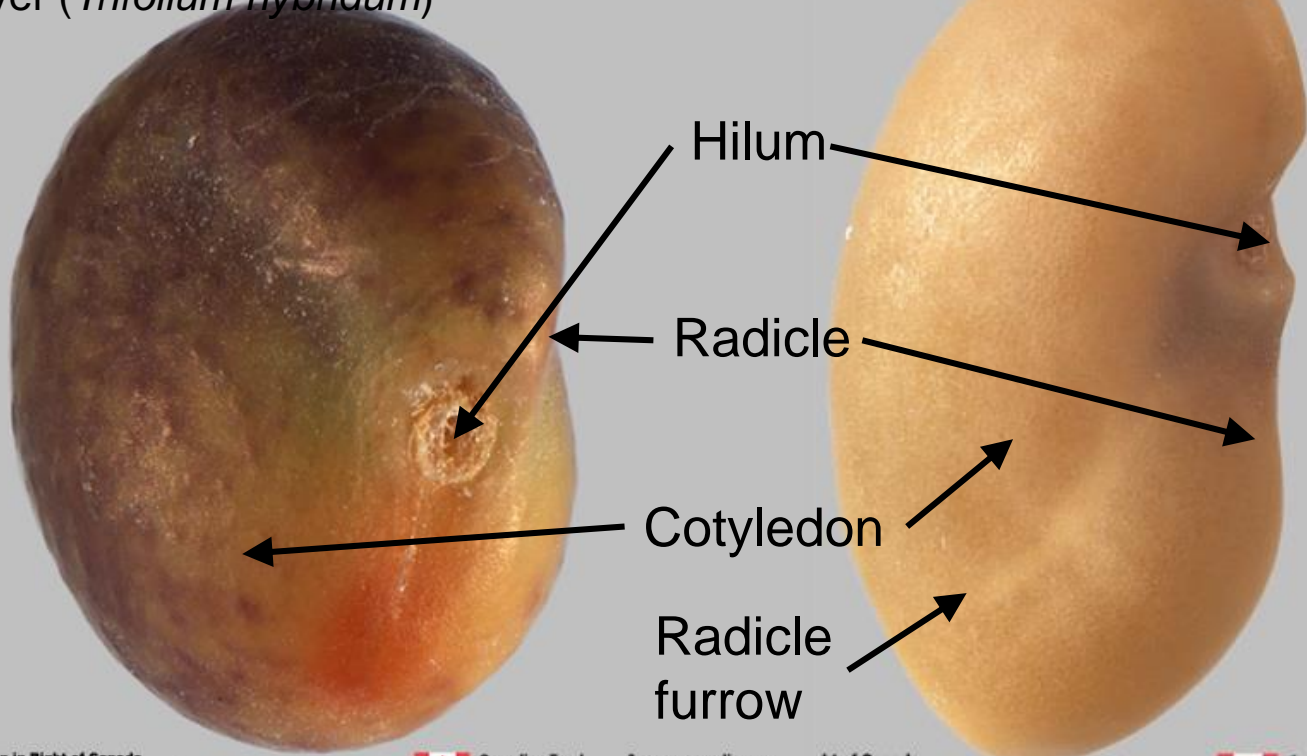
Canadian Food Inspection Agency Agence canadienne d'inspection des aliments

Fabaceae Seed Anatomy

Alfalfa (*Medicago sativa*)

Alsike clover (*Trifolium hybridum*)

mm



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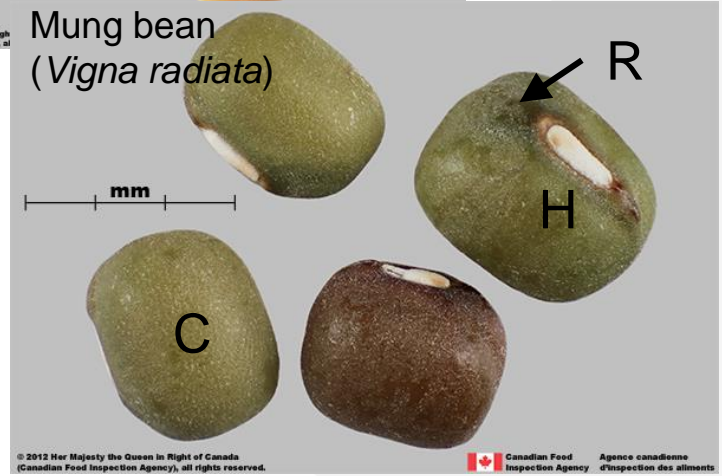
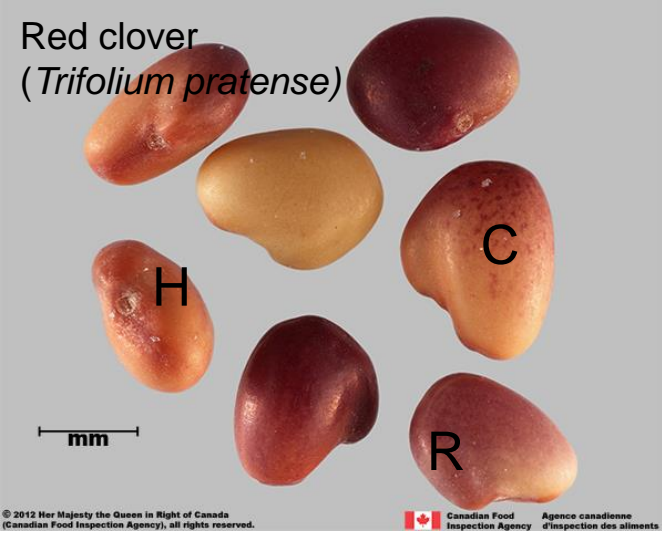
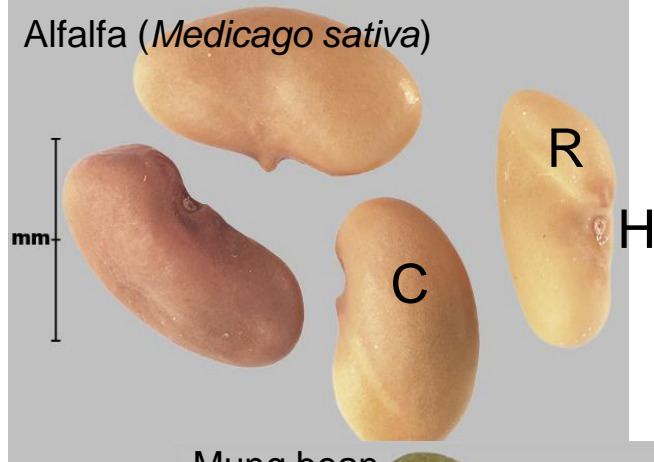
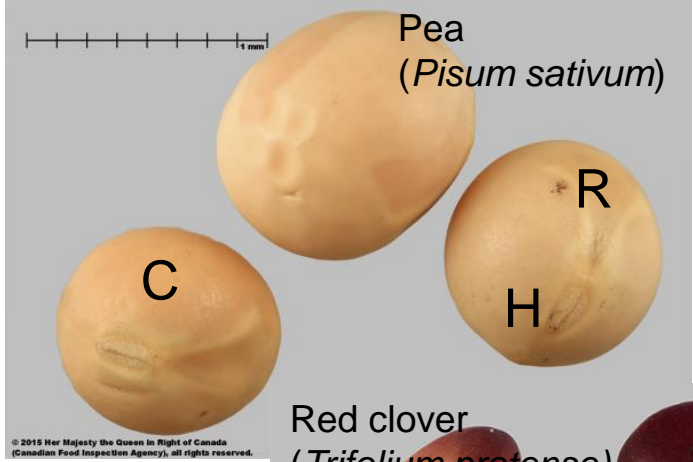
Fabaceae Seed Identification Features: Shape and Quiz #1

(Find the radicle, cotyledons and hilum)



Fabaceae Seed Identification Features: Shape and Quiz #1

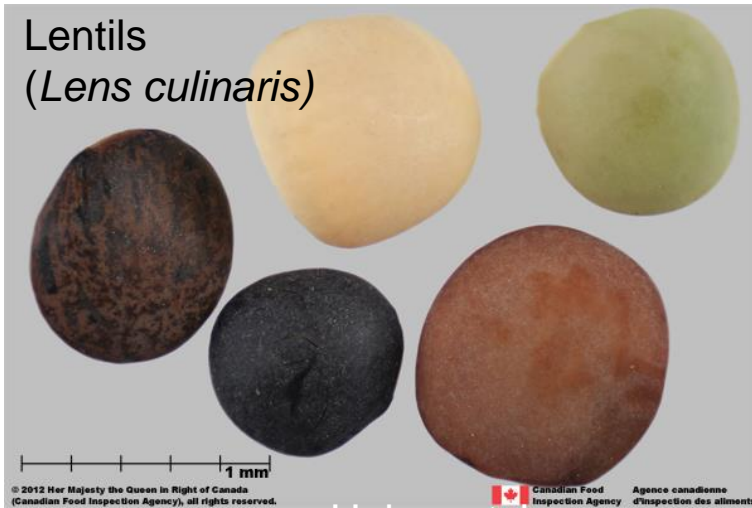
(Find the radicle, cotyledons and hilum)



Fabaceae Seed Identification

Features: Colour + Pattern

Lentils
(*Lens culinaris*)



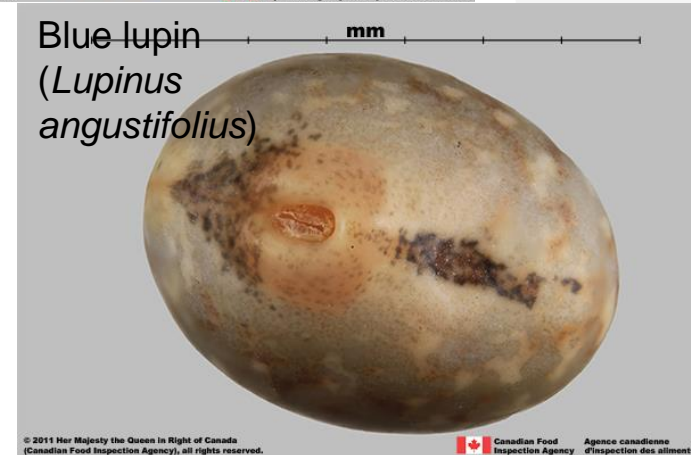
Lima bean
(*Phaseolus lunatus*)



Hairy vetch
(*Vicia hirsuta*)

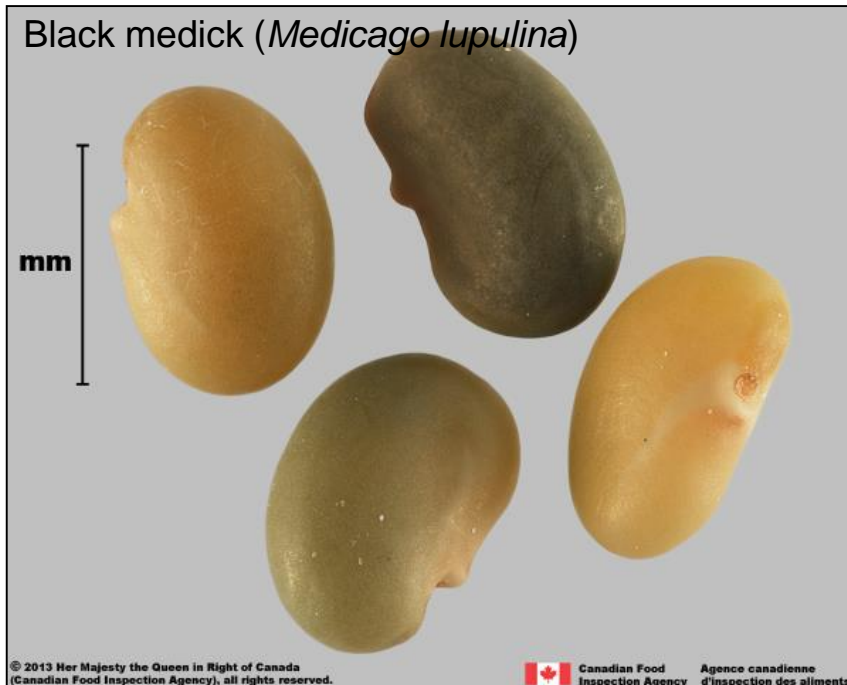


Blue lupin
(*Lupinus angustifolius*)



Fabaceae Seed Identification

Features: Colour Changes



Fresh seeds



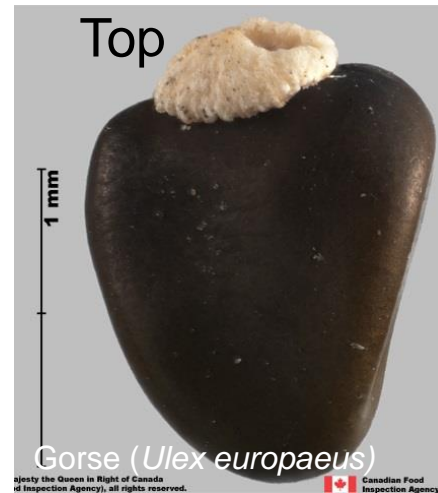
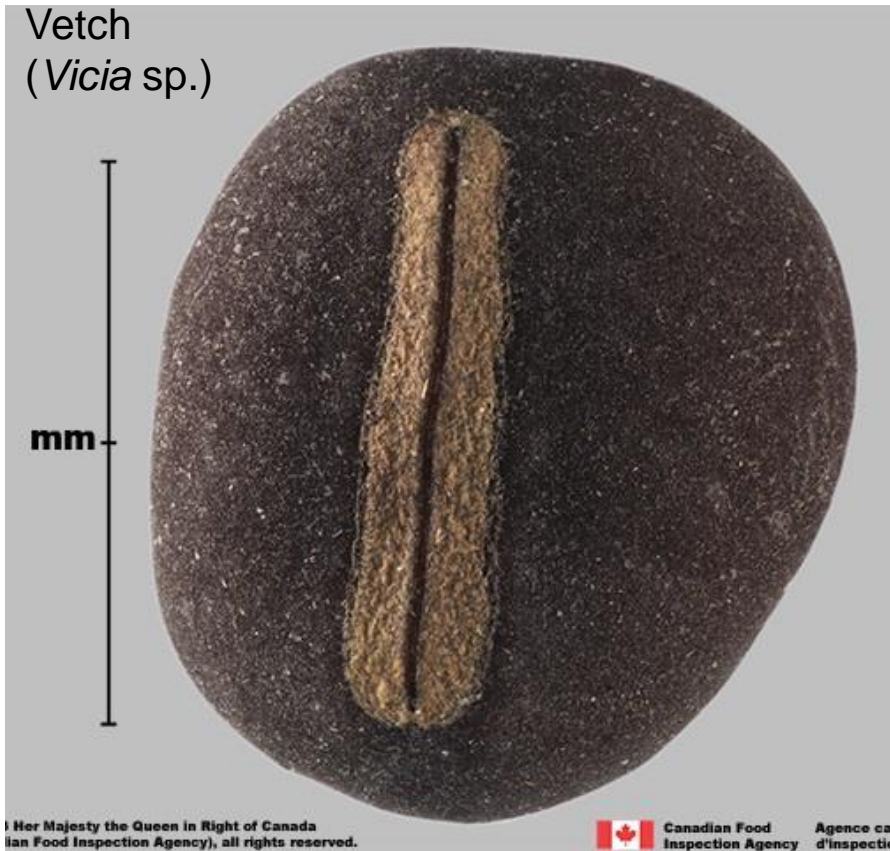
Fabaceae Seed Identification

Features: Colour Changes



Sweet
clover
(*Melilotus
albus*)

Fabaceae Seed Identification Features: Hilum and Position



Fabaceae Seed Identification

Features: Hilum Shape and Size



Round hilum



Short oval hilum



Long oval hilum

Fabaceae Seed Identification

Features: Hilum Aril

Snap bean
(*Vigna unguiculatus*)



Common lespedeza
(*Kummerowia striata*)



Gorse
(*Ulex europaeus*)

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Not an aril



Lupine
(*Lupinus albus*)

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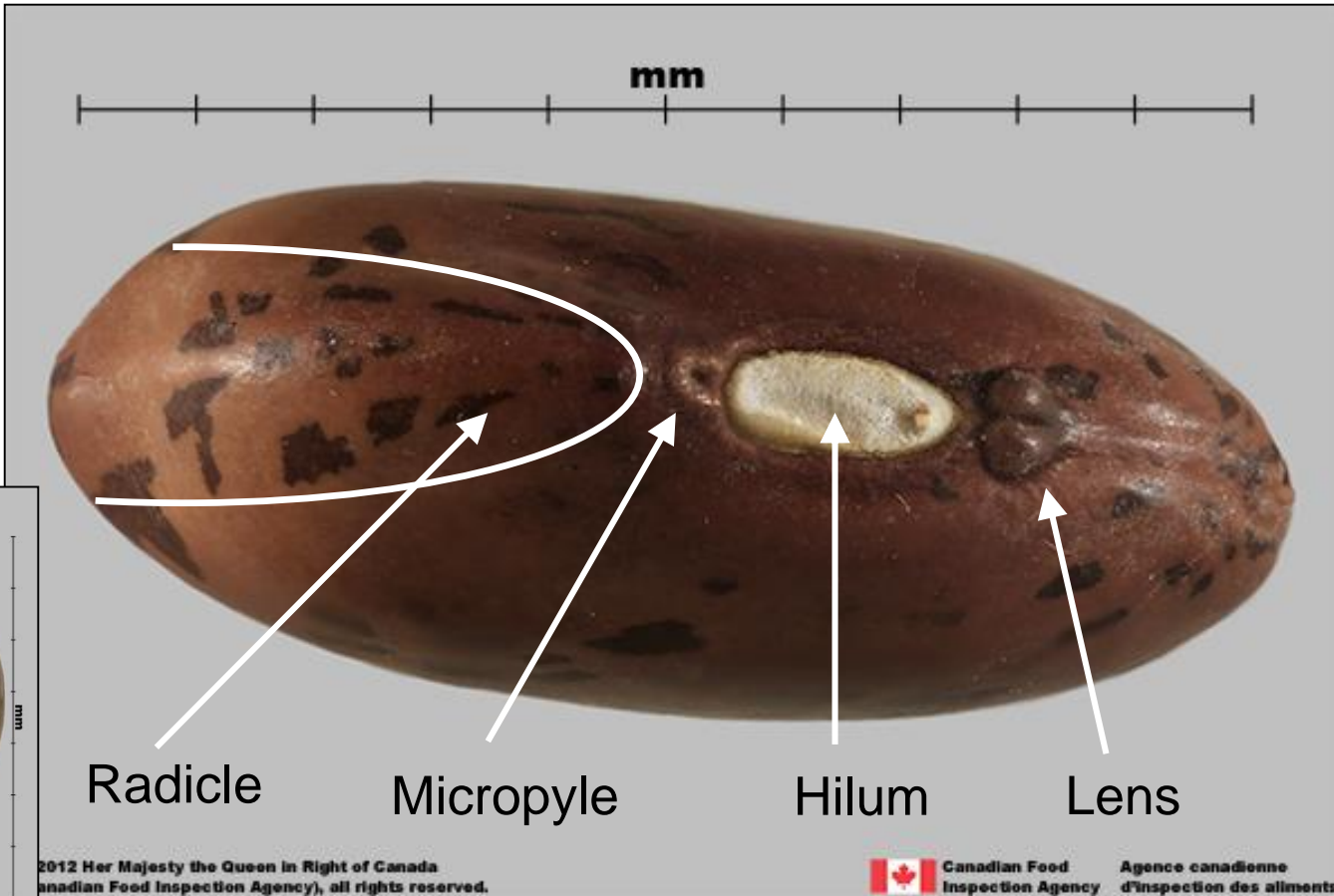


Hairy vetch
(*Vicia hirsuta*)

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Fabaceae Seed Identification

Features: Associated with Hilum



Garden bean (*Phaseolous vulgaris*)

Hello, there is a lens right here



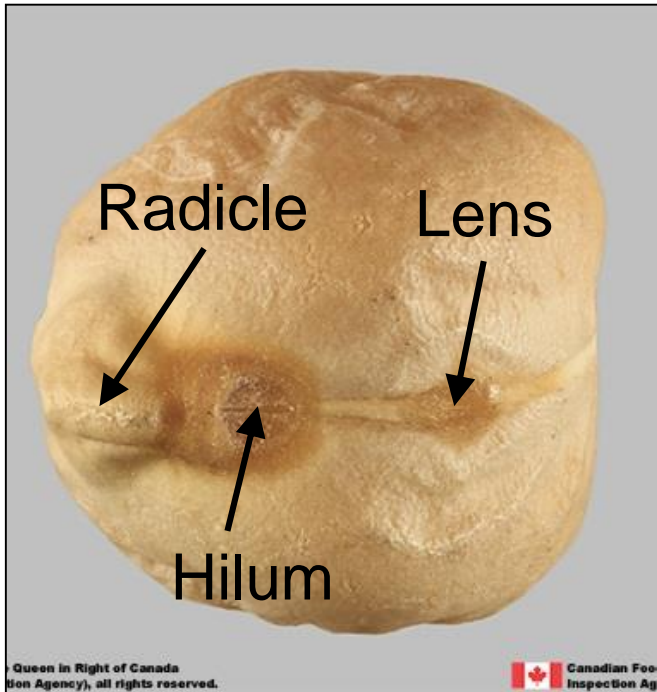
Blue lupin (*Lupinus angustifolius*)

Fabaceae Seed Hilum Features: Quiz #2: Find the hilum, radicle and lens



Fabaceae Seed Hilum Features:

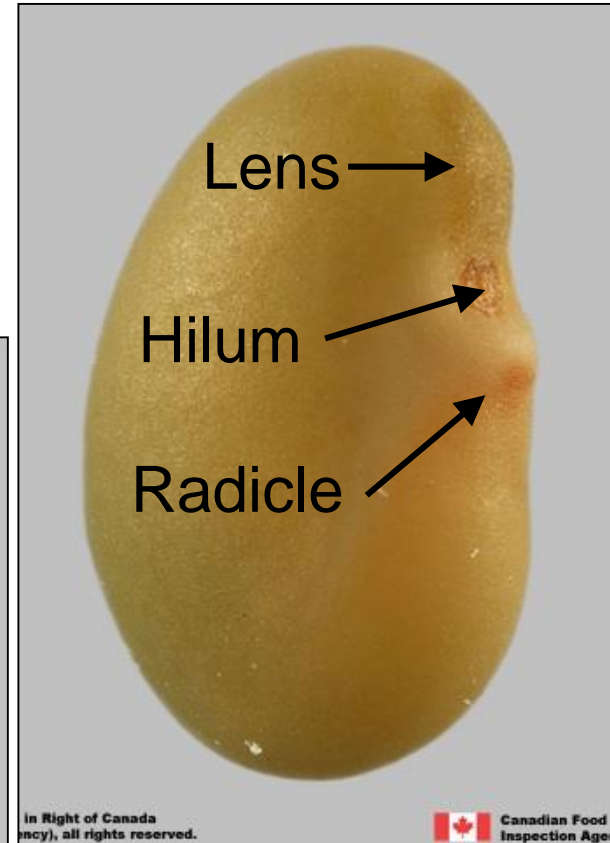
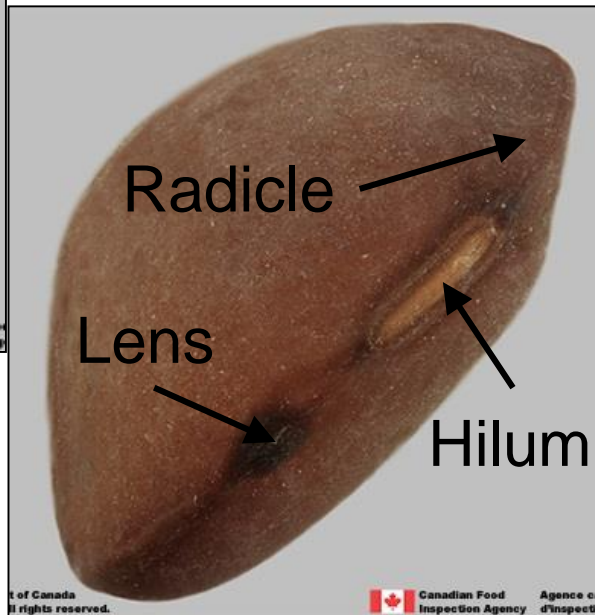
Quiz #2: Find the hilum, radicle and lens



Chickpea
(*Cicer arietinum*)

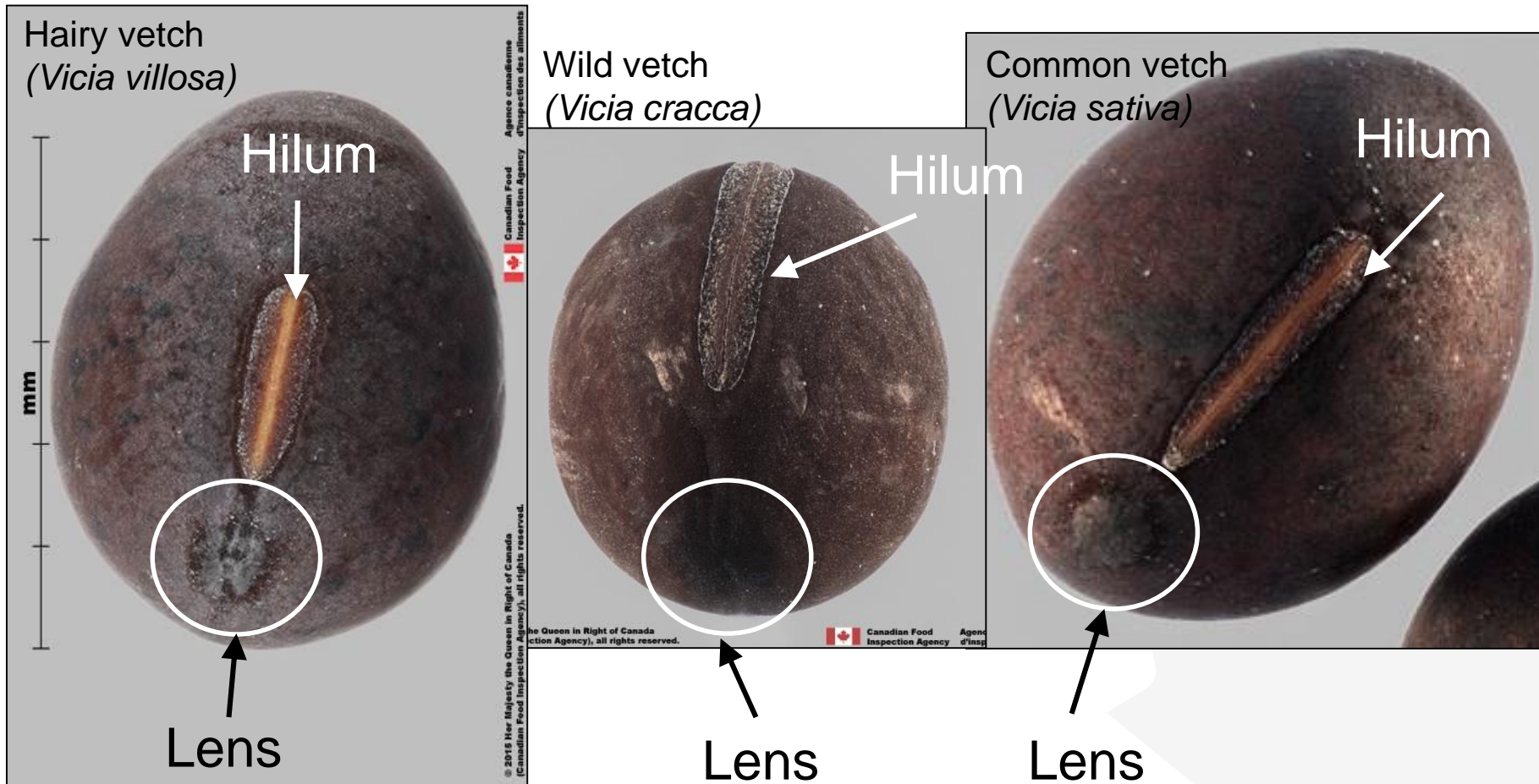
and lens

Lentil
(*Lens culinaris*)

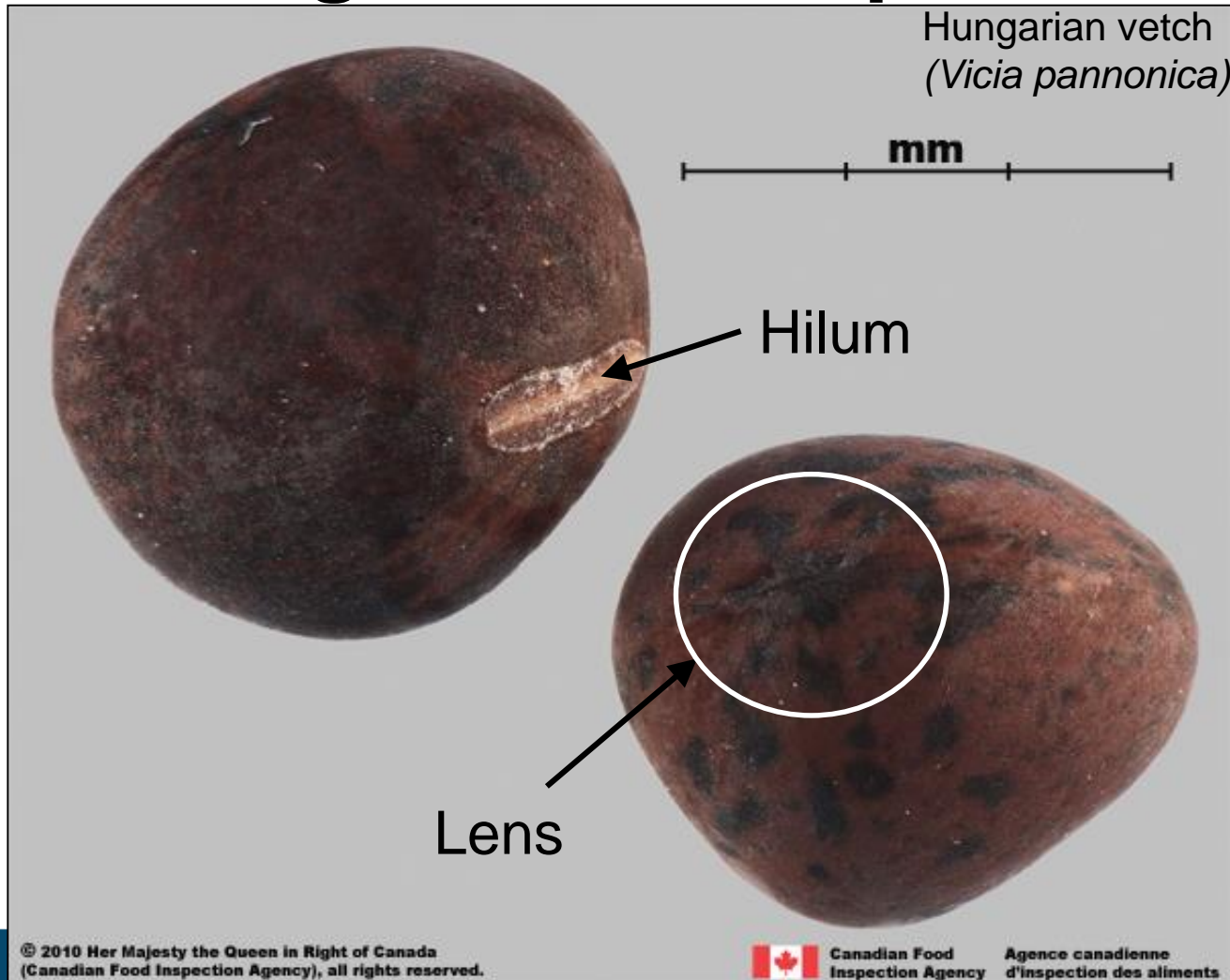


Black medick
(*Medicago lupulina*)

Using the Hilum and Lens to Distinguish *Vicia* Species

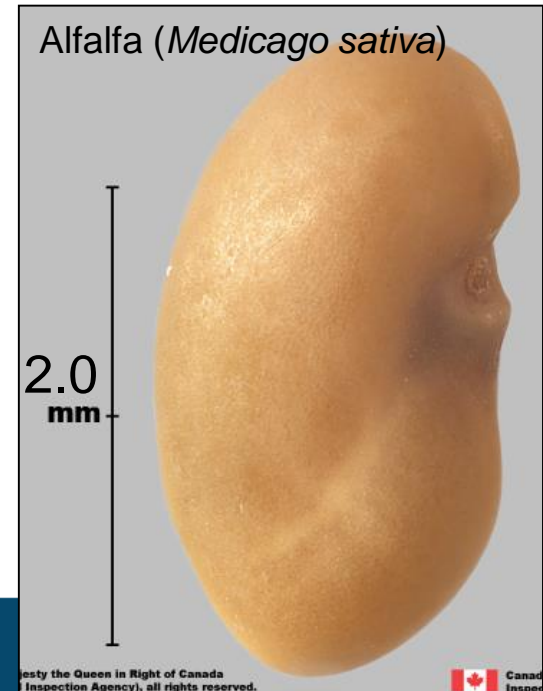
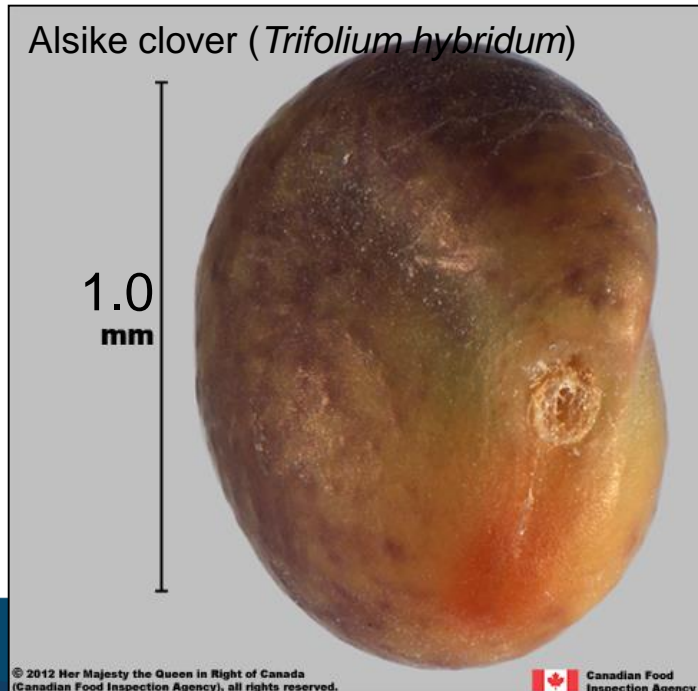


Using the Hilum and Lens to Distinguish *Vicia* Species



Fabaceae Quiz #3

1. What is the unique fruit of the Fabaceae called?
2. Find the cotyledons (C), radicle (R), radicle furrow (RF), hilum (H) and lens (L).
3. Which features of these seeds are similar, and which are different (how can you tell these seeds apart)?



Fabaceae Quiz #3

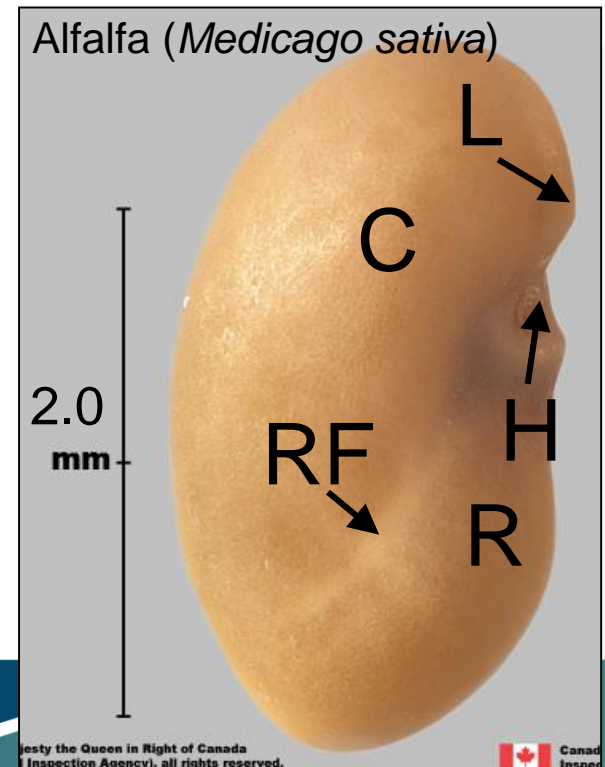
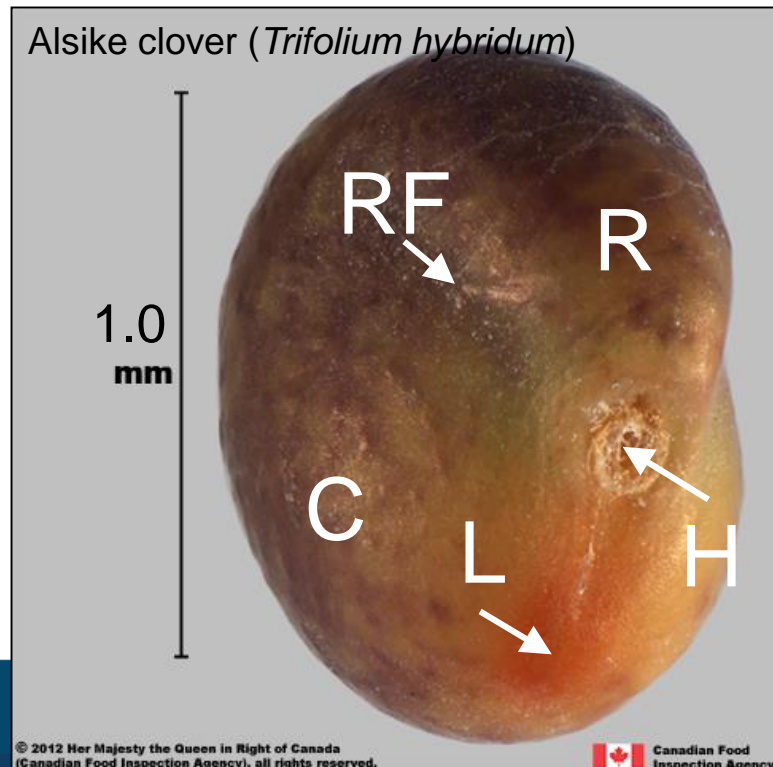
1. What is the unique fruit of the Fabaceae called? **Legume**
2. Find these features: cotyledons (C), radicle (R), radicle furrow (RF), hilum (H) and lens (L).
3. Which features of these seeds are similar, and which are different (how can you tell these seeds apart)?

Similar features:

- Round hilum
- Large radicle lobe

Differences:

- Alfalfa longer
- Different shape
- Different colour + pattern
- Lens stands out in the clover



Thank you!

Acknowledgements:

Seeds for imaging: National Seed Herbarium

Questions/comments send to:
SSTS@inspection.gc.ca

Canada