

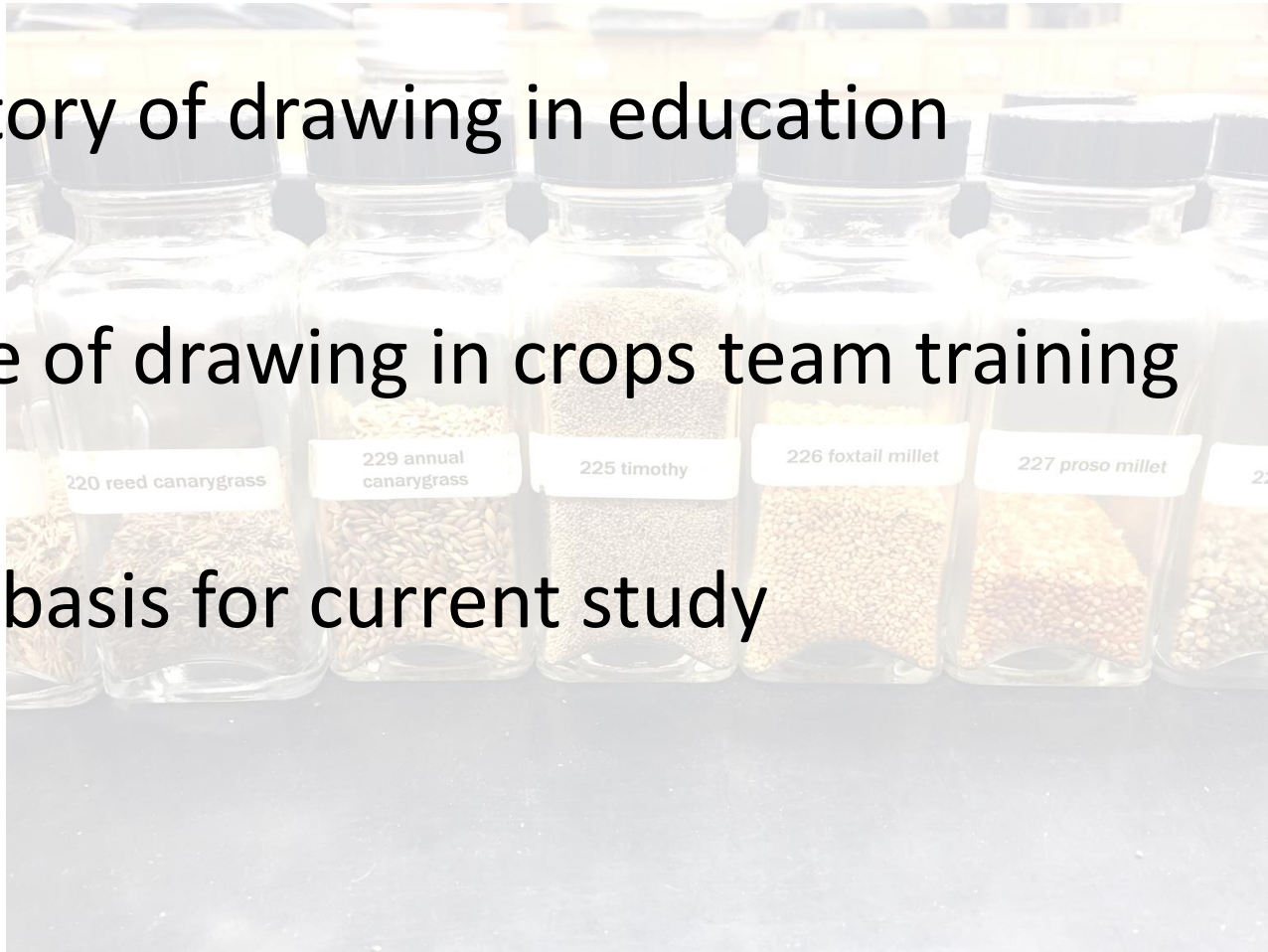


Is a Traditional Drawing Exercise for Plant and Seed Identification Still Effective for Millennial Students?

Marshall Hay and Kevin Donnelly
Kansas State University

Background

- History of drawing in education
- Role of drawing in crops team training
- Set basis for current study





Plant and Seed Identification Class

- Semester long, two credit course
- Identify 225 species
 - Both plant and seed required for most species
 - Specific varieties for some crops
 - About 25 introduced each week
- Learning facilitated through multiple mediums

Lab with study resources available to students



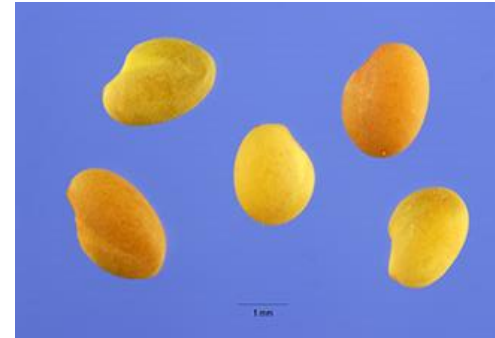
Weekly quiz – new samples plus review



This is not easy stuff!!!!



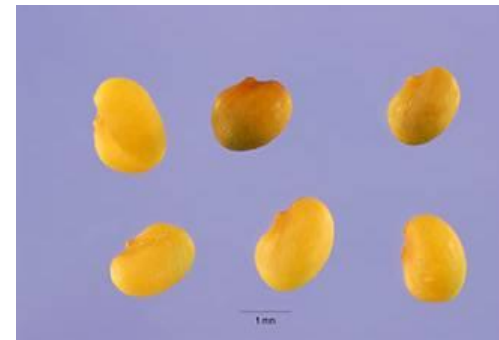
alfalfa



sweetclover



red clover



black medic

From: USDA Plants Database, <http://plants.usda.gov/java/imageGallery>

Drawing Exercise Added in 2015





Objectives of Study

- Determine the influence of facilitated drawing on student understanding of identification
- Compare drawing medium to other methods currently implemented
- Assess student perceptions of how drawing enhanced their learning

Methods

- Facilitated drawing times during class
 - Focus placed on key characteristics for each weekly quiz
 - About 45 minutes of two hour lab
- Open environment
 - Group work
 - Teaching assistant circulation



AGRON 350 Spring 2015

Forage Legume Practice

8.1 Consider the seed of **alsike clover**, **birdsfoot trefoil**, **alfalfa**, **sweetclover**, **red clover**, and **white clover**. Diagram the seeds and make note of various characteristics such as general shape, thumb position, symmetry, and color transition.

alsike clover

birdsfoot trefoil

alfalfa

sweetclover

red clover

white clover

8.2 Consider **black medic** and **large hop clover**. Diagram the varying characteristics of the two species. Include details such as leaflet structure, flower senescence, and legume pod shape. Use color where necessary.

Drawing Assessment

- Participatory grades for credit
 - Part of in-class participation score
 - Maximum 20 points out of 900 total
- Quality of drawings rated on a scale of 1 to 5
 - Completion
 - Detail
 - Reference notes

Spotted knapweed



brown

Russian knapweed



white safflower

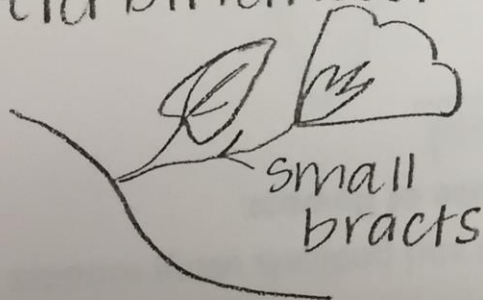
perennial sowthistle



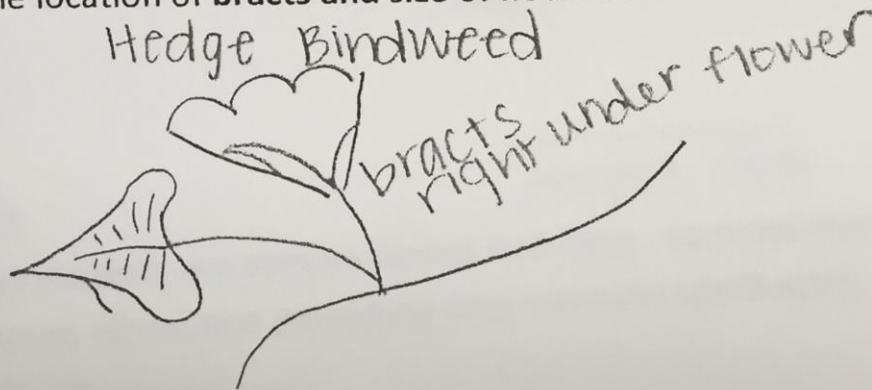
extreme ridges
brown

1.5 Distinguish between field bindweed and hedge bindweed flowers and pedicels using mounts and online pictures. Diagrams should include the location of bracts and size of flowers.

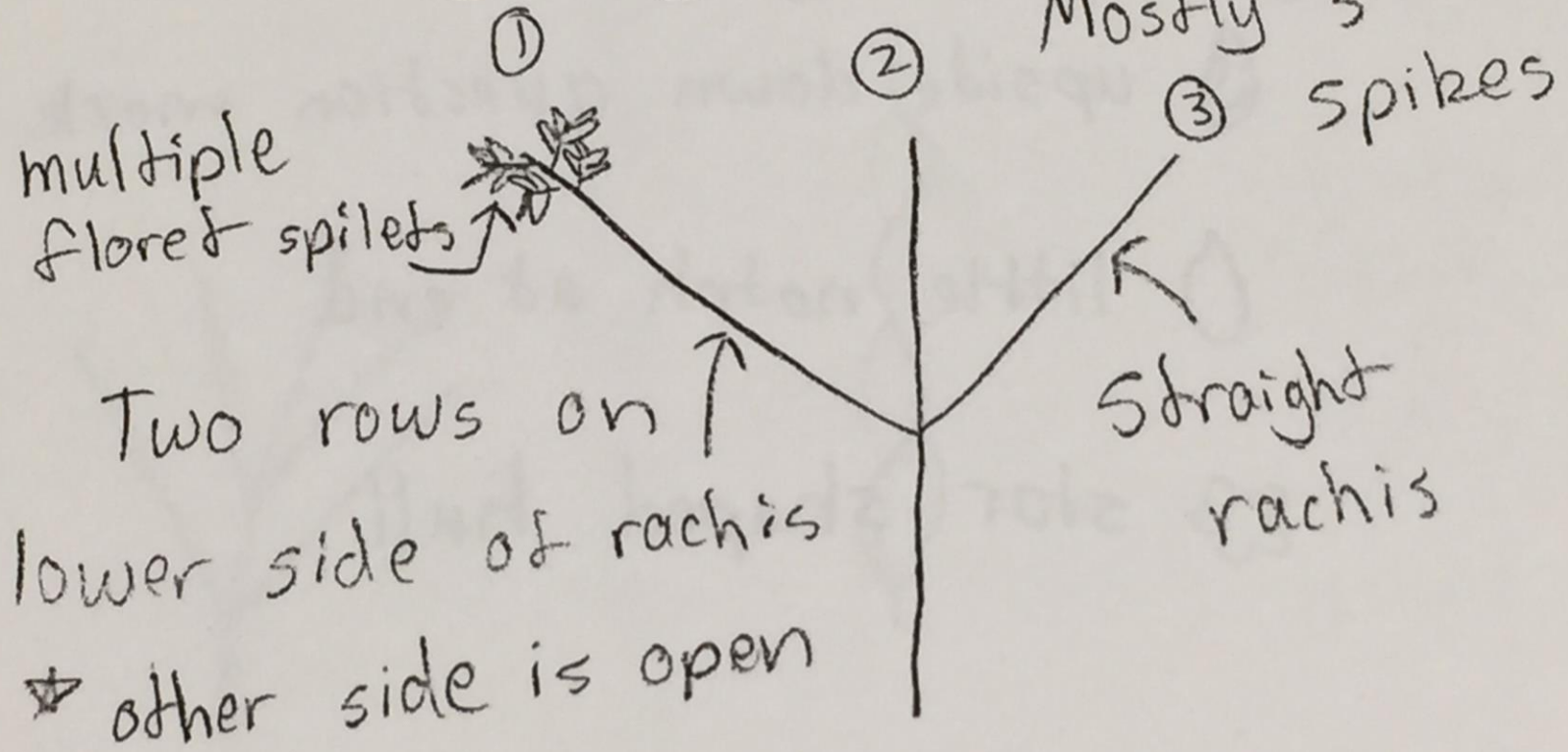
field bindweed



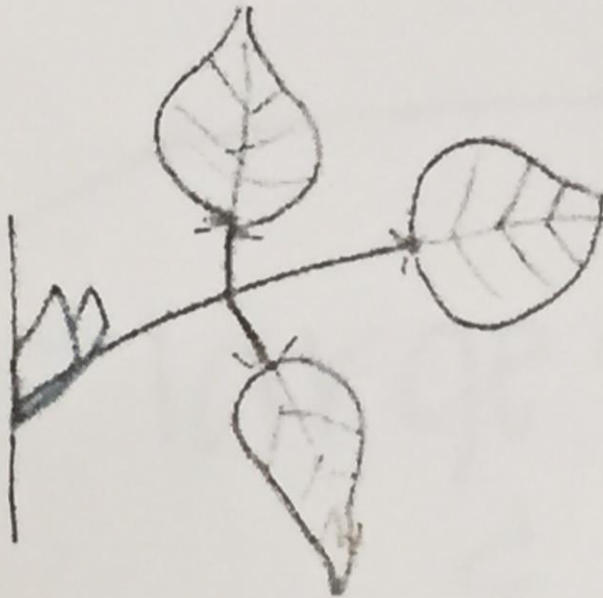
Hedge Bindweed



goosegrass!

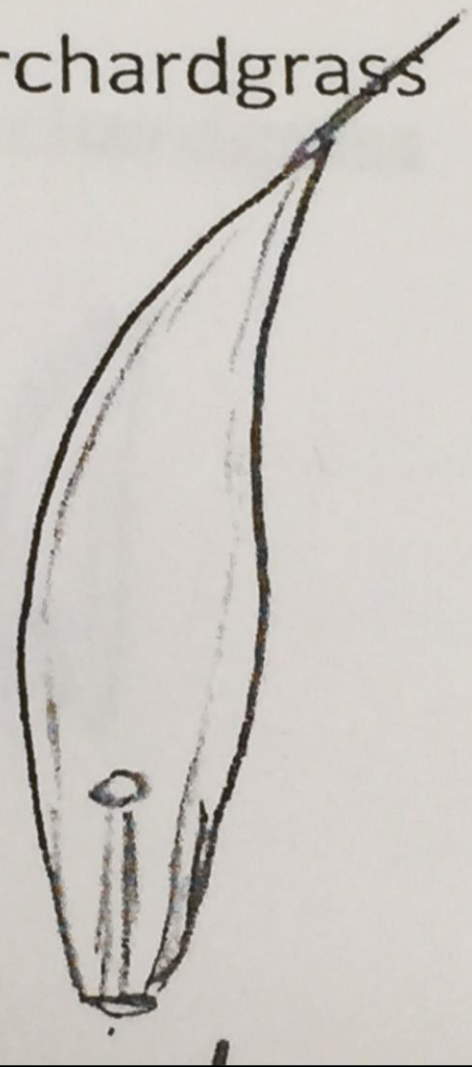


green mungbean

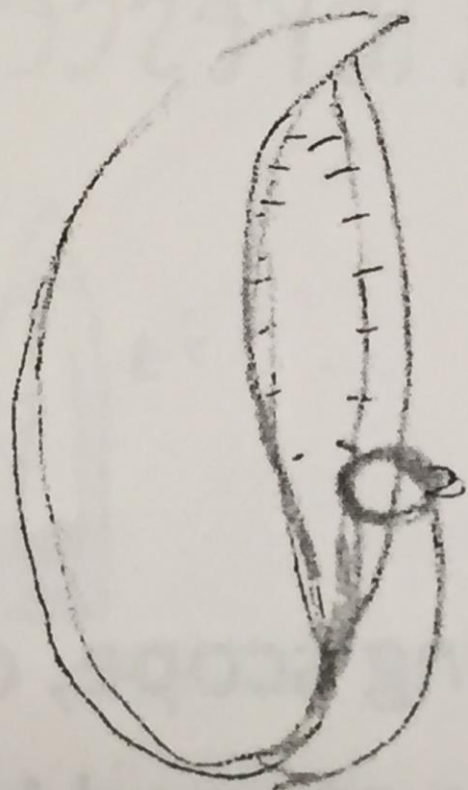


large stipules
hairy

orchardgrass



crested wheatgrass



short,
stubby,
cupped
rachilla
projects
outward

7.2 Consider the inflorescence of perennial ryegrass
edgewise versus flat attachment of spikelets and

perennial ryegrass



spike inflorescence w/
spikelets alternating
sides
edgewise attachment
to the rachis

of glumes for each spikelet.

quackgrass

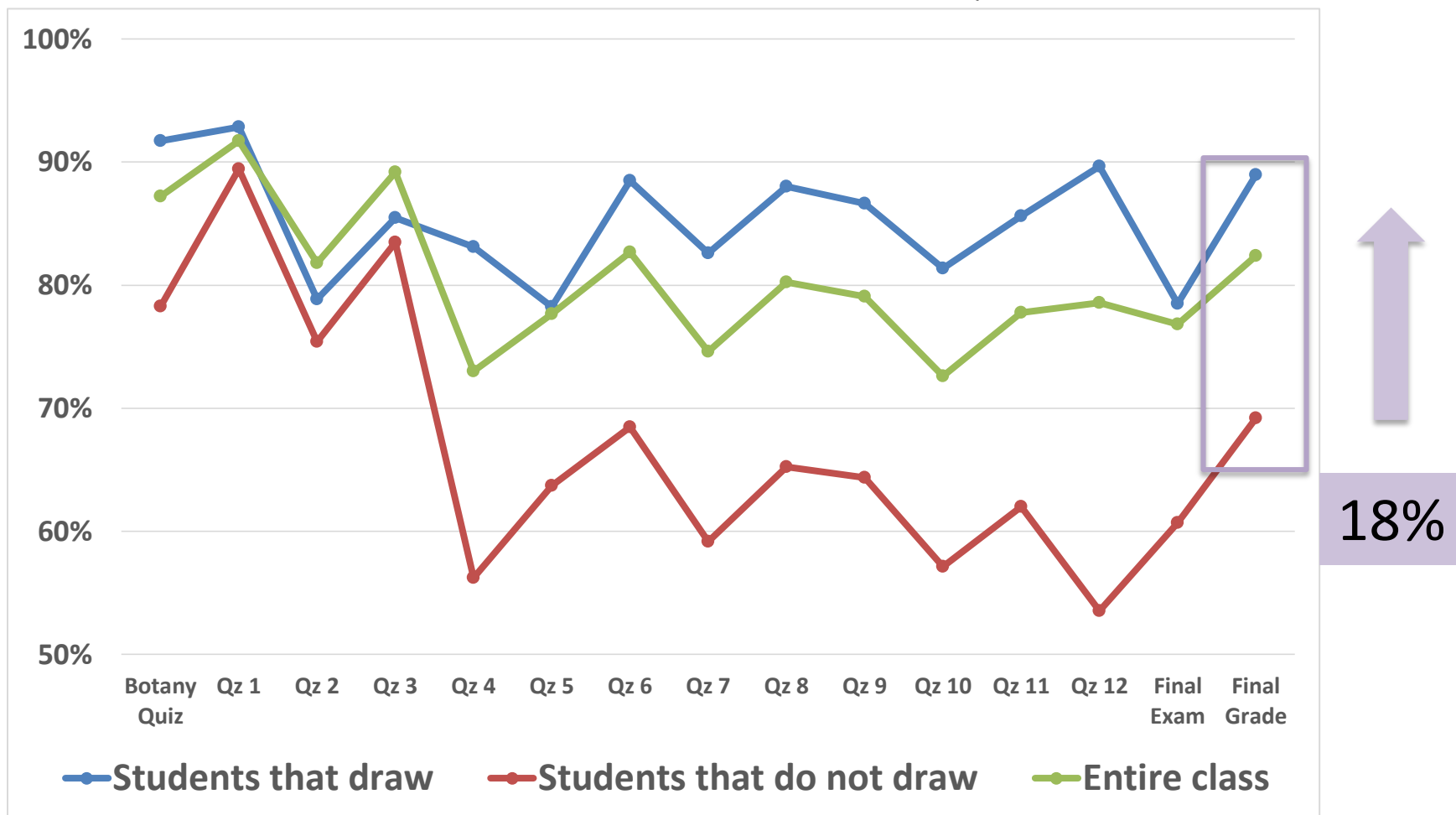


- attached flat like
a duck bill
- cannot see the
rachis all the
way up.

Drawing Outcomes

- 21 students in the class
- Defined two groups for analysis
 - 14 regular participants
 - 7 limited engagement
- Quality of drawing was evaluated, but students only received a “yes/no” participation score

Performance on Quizzes



Correlation Between Drawing Rating and Quiz Score

Quiz Type	Correlation
Botany Quiz	0.000
ID Qz 1	0.411
ID Qz 2	0.222
ID Qz 3	0.569
ID Qz 5	0.086
ID Qz 6	0.506
ID Qz 7	-0.005
ID Qz 8	0.057
ID Qz 9	0.601
ID Qz 10	-0.102
ID Qz 11	-0.001
Average	0.213



Student Perceptions

- Two surveys
 - Mid-term and end of class
 - Very consistent results
- 68% percent of students were “okay with” or “enjoyed” completing the drawing exercises
- 73% felt that reviewing their hand drawings were “somewhat effective” or “very effective” in preparing for weekly quizzes
- All students indicated that drawings enhanced their identification skills for the future

Perceived Importance of Different Learning Methods

Rate the following items as to how effective you think they are in helping you learn to identify the plants and seeds:	Rating*
Personally studying the samples provided in the lab	3.84
Lecture presentations by Dr. Donnelly on Wednesdays	3.26
Comments, questions, or discussion with Teaching Assistants	3.10
Reviewing written hints printed in the lab manual	2.84
Reviewing my personal notes added to the lab manual	2.84
Reviewing PowerPoint slides and interactive quizzes	2.79
The drawing exercises completed in class on Mondays	2.63

* 4=most effective 3=somewhat effective 2=slightly effective 1=not effective



Conclusions

- 18% higher final grades for regular participants
- Participation appears to be more important than quality of drawing
- Will be continued with additional weight toward final grade in future
- Targeted at all students as means to influence long term understanding of the material