University of Manitoba
Faculty of Agricultural and Food Sciences
Department of Plant Science

PLNT 0770

Weed Management

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COURSE DETAILS

Course Title & Number:	Weed Management PLNT 0770
Number of Credit Hours:	4 Credit Hours
Class Times & Days of Week:	Monday, Wednesday, Friday 10:30-11:20AM Remote learning via Webex
Course Web Page **Location for classes/labs/tutorials:**	**https://universityofmanitoba.desire2learn.com/d2l/login** Wednesday 2:30–3:45PM or Thursday 11:30AM-12:45PM Remote learning via Webex
Pre-Requisites:	DAGR 0420

Instructor Contact Information

Instructor(s) Name:	Dr. Rob Gulden
Office Location:	After lectures, I will be available on Webex for 15-20 minutes to answer any questions. If this is not suitable, please feel free to contact me via e-mail.
Email:	Lecture and course: Rob Gulden: rob.gulden@umanitoba.ca Laboratory inquiries: Jonathan Rosset umrosse2@myumanitoba.ca Please feel free to contact the instructor or lab TA for any questions or concerns you may have. Every attempt will be made to respond to e-mails within 2 business days. Response to e-mails will be limited to regular office hours (M-F 8:30am - 4:30pm). *Note*: All email communication must conform to the University of Manitoba - University Governance - Governing Documents: University Community (umanitoba.ca) university policy.

Course Description

PLNT 0770 Weed Management Cr.Hrs. 4 (Formerly 039.077) General principles of pest management and pesticide use safety as they relate to weed control. Economic importance, principles of cultural, biological and chemical weed control, weed identification, introduction to herbicides and factors influencing their use and selectivity. Prerequisite: DAGR 0420 (or 065.042).

This course will give the student the ability to identify most of the weeds common to Manitoba. Identification of the weeds is an important first step in being able to manage weeds. The course will also provide students with the knowledge to use herbicides safely, effectively, and in conjunction with integrated weed management techniques to reduce the selection for and/or help with the management of herbicide-resistant weed biotypes. This will be useful for students that are returning to a farm or that are working as advisers, extension specialists, agronomists or in other agricultural positions.
This course will be useful to all students who see themselves involved in any part of the agricultural production sector.

General Course Information

Students are expected to attend lecture and lab classes. Course notes for lectures are made available through UMLearn at https://universityofmanitoba.desire2learn.com/ Students are encouraged to participate in class and labs by asking questions or providing appropriate comments from their own experiences that will add to the learning of all students. Students are expected to complete assignments on time.
Lectures are presented with the assistance of PowerPoint slides. On occasion informal small groups will be used to discuss issues raised in class. Student questions and comments are encouraged.
For students who have taken general crop production courses in PLNT 0420 and PLNT 0410, this course is an extension of these courses focusing on optimized crop production to manage weeds, maintain productivity and minimize the risk and impacts of herbicide resistance.

Course Goals

The student will learn how to prevent weeds from interfering with the intended use of the land. Students will learn how crop and variety selection, crop rotation or sequencing, farming systems, tillage systems, and environmental conditions affect weeds and weed management. Students will learn four major methods of managing weeds: cultural, biological, mechanical and chemical and how to combine these into effective and sustainable weed management systems.

Using Copyrighted Material

Please respect copyright. We will use copyrighted content in this course. I have ensured that the content I use is appropriately acknowledged and is copied in accordance with copyright laws and University guidelines. Copyrighted works, including those created by me, are made available for private study and research and must not be distributed in any format without permission. Do not upload copyrighted works to a learning management system (such as UM Learn), or any website, unless an exception to the *Copyright Act* applies or written permission has been confirmed. For more information, see the University's Copyright Office website at http://umanitoba.ca/copyright/ or contact um_copyright@umanitoba.ca.

Recording Class Lectures

Synchronous lectures and labs provided via Webex will be recorded and available on UM learn for a limited period of time. Recorded synchronous material will be available via streaming only. Downloading of this material is not permitted. Asynchronous course material will be uploaded on UM Learn.

Textbook, Readings, Materials

Textbook(s) –
Guide to Crop Protection (online)
http://www.gov.mb.ca/agriculture/crops/index.html

Optional Reference Books:
Weeds of Quebec, available at the bookstore/online
Weeds of the Prairies, Alberta Agriculture and Rural Development
Weed Seedling Guide (province)
Ross and Lembi. Applied Weed Science. 1985
Wood, Powell, Anderson. Weed Science Principles. 1996
R.J. Aldrich. Weed Crop Ecology. 1984
R.J. Aldrich and R.J. Kremer. Principles of Weed Management 1997
http://www.umanitoba.ca/academic_support/libraries/
Robert Zimdahl, Fundamentals of Weed Science, 1999
T J Monaco, S C Weller, F M Ashton, Weed Science: Principles and Practices, 2002
L Hall, H Beckie, T Wolf, How Herbicides Work: Biology to Application, 1999
L Hall, How Herbicides Work: Mechanisms of Action, 1996
Liebman, Mohler, Staver, Ecological Management of Agricultural Weeds, 2001

Course Technology

Technology – It is required that you have all hardware, software and connection ability necessary to successfully operate UM Learn and WebEx for synchronous delivery of course materials. Course material, grades and communication will occur using UM Learn. We will also be using iClicker Cloud for participation and practice. Thus, you will need to setup an iClicker Cloud account.

Lectures and labs will be synchronous within UM Learn via Webex. Synchronous lecutres and lab sessions will be recorded and available in UM Learn. These recordings can be streamed but not downloaded or distributed due to copyright. It is important to respect copyright of all material used within this course. Lectures and labs also may have asynchronous components that are to be watched outside of regular lecture and labs slots.

Please see the support section within UM Learn for questions regarding the use of UM Learn, Webex and iClicker Cloud.

Please utilize the UM Learn tutorials for remote learning, UM Learn and Webex.

It is the general University of Manitoba policy that all technology resources are to be used in a responsible, efficient, ethical and legal manner. The student can use all technology in classroom setting *only for educational purposes approved by instructor* and/or the University of Manitoba Student Accessibility Services. Student should not participate in personal direct electronic messaging / posting activities (e-mail, texting, video or voice chat, wikis, blogs, social networking (e.g. Facebook), online and offline "gaming" during scheduled class time. If student is on call (emergency) the student should switch his/her cell phone on vibrate mode and leave the classroom before using it. (©S Kondrashov. Used with permission).
Students need to ensure that they are familiar with the use of this software too access class notes, the course syllabus, assignments and other important information regarding this course.

Class Communication

The University requires all students to activate an official University email account. For full details of the Electronic Communication with Students and other policies please visit: http://umanitoba.ca/admin/governance/media/Responsibilities_of_Academic_Staff_re_Students_ROASS_Procedures_-_2016_09_01.pdf

Please note that all communication between myself and you as a student must comply with the electronic communication with student policy http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_with_students_policy.html). You are required to obtain and use your U of M email account for all communication between yourself and the university.

Expectations: I Expect You To

During synchronous lectures and labs, students are expected to contribute to a respectful work and learning environment (refer to Respectful Work and Learning Environment Policy). Disruptions not related to course material will not be tolerated. Students are expected to attend all lectures (see iclicker component below).
Assignments are to be done individually unless otherwise indicated and all University of Manitoba policies on Academic integrity | University of Manitoba (umanitoba.ca) must be adhered to.
The instructor adds valuable and new information to augment the slides provided on UMLearn. Students are expected to take additional notes during class. All material presented in class and the lab including that not on slides is examinable.

Students Accessibility Services

Student Accessibility Services
If you are a student with a disability, please contact SAS for academic accommodation supports and services such as note-taking, interpreting, assistive technology and exam accommodations. Students who have, or think they may have, a disability (e.g. mental illness, learning, medical, hearing, injury-related, visual) are invited to contact SAS to arrange a confidential consultation.
Student Accessibility Services Accessibility | University of Manitoba (umanitoba.ca)
520 University Centre
204 474 7423
Student_accessibility@umanitoba.ca

Links to other available student services are provided in Schedule A which has been uploaded into this course on UMLearn.

Course Content

This schedule is subject to change at the discretion of the instructor and/or based on the learning needs of the students but such changes are subject to Section 2.8 of the – ROASS-Procedure).

1. Introduction
   Course description and marking scheme, General considerations, Careers in weeds, Definitions of a weed, Damage caused by weeds, Origin of weeds
2. Biology of Weeds
   Life cycles and growth habits, Reproduction and dissemination of weeds, Germination and dormancy.

3. Weed-Crop Competition
   - Competition for water, nutrients, light, yield reduction factors (Critical weed free period, Economic considerations)
   - Electronic Guides to Crop Protection
   - http://www.gov.mb.ca/agriculture/crops/index.html
4. Methods of Weed Management
   - Chemical Weed Management
     - Herbicide history, Classification of herbicides (e.g. http://weedscience.org/summary/home.aspx)
     - Pesticide Applicator Licence Province of Manitoba | agriculture - Pesticide Applicator Licence (gov.mb.ca)
     - Formulations and carriers, Adjuvants, Tank mixing, Incorporation of soil-applied herbicides, Herbicide toxicity http://www.uoguelph.ca/ses/content/canadian-network-toxicology-centres
     - Safety precautions: MSDS http://www.msds.com/
     - Factors affecting herbicide performance, Movement of herbicides in the soil
     - Fate of herbicides in the environment
5. Herbicide Resistance
   - Occurrence in western Canada and lessons from elsewhere
   - http://www.weedscience.org
   - Mechanism of resistance, Predicting resistance, Managing/Avoiding resistance, Herbicide resistant crops
6. Integrated Weed Management http://ipmworld.umn.edu/textbook.htm
   - Cultural Mangement (shifting the competitive balance in favour of the crop)
     - Seeds Act
     - http://www.inspection.gc.ca/english/reg/rege.shtml
     - Weed seed order
     - Pest Management Regulatory Agency
     - http://www.hc-sc.gc.ca/cps-spc/pest/index-eng.php
   - Mechanical Management (Tillage, clipping etc.)
   - Biological Management (broad spectrum, classical, and inundative approaches)

Laboratory Expectations

Attendance and weekly assignments are compulsory as **a failing grade in the lab component will result in failing grade in the course**. Students are expected to be respectful and clearly follow the instructions provided by the TA.

Lab Content

1) Weed identification
2) Introduction to herbicides
3) Familiarization with the Guide to Crop Protection
4) Herbicide injury symptoms
5) Case study problem solving

Course Evaluation Methods

Refer students to the Assignment Description on the following page of the syllabus for Details.

Due Date:	**Assessment Tool**	**Value of Final Grade**
In-Class		
Due Fri. Jan 14, 2022	E-mail assignment	3%
All term	Class participation *	10%
All term	Iclicker **	15%
10:30, Mon., Feb. 14, 2022	Mid-Term	10%
Written due Fri. March 18, 2022 Oral part March 23 – Apr. 6	Written assignment Oral Assignment by Appointment	15%
TBA	Final Exam (Cumulative)	17%
In-Lab * **		
~ last week in Jan, Feb & March	3 Quizzes @ 10% each	30%
Total		**100%**

* Class participation marks will be awarded based on number and quality of the contributions to class material and discussions. These must be individual contributions that may be either be through contributions to in class material, contributions to class discussions or questions related to the course material posed at the end of or outside of class.

**** Iclicker** - Students are required to bring their iclicker to each class. For each question asked students will receive one point for answering the question and one point for answering correctly. The iclicker grade will be determined as the sum of all questions asked during lectures and weighted according to the points earned for each question. Students that have received at least 80% of the iclicker points will receive 100% of the total allocated mark, those with 70-79% of the points will receive 80% of the total allocated mark, those with 60-69% of the points will receive 60% of the total allocated mark, those with 50-59% of the points will receive 40% of the total allocated mark, and those with less than 50% of the iclicker points will receive a grade of 0. Students must register their iclicker online at University of Manitoba - Information Services and Technology - Teaching and Learning - iClicker Integration - General inquiry (umanitoba.ca)

*** Students must receive a passing grade in the laboratory portion of this course to receive a passing grade in the course.

Grading

General grading scheme subject to modification by instructor is as follows:

Letter Grade	Percentage out of 100	Grade Point Range	Final Grade Point
A+	95-100	4.25-4.5	4.5
A	86-94	3.75-4.24	4.0
B+	80-85	3.25-3.74	3.5
B	72-79	2.75-3.24	3.0
C+	65-71	2.25-2.74	2.5
C	60-64	2.0-2.24	2.0
D	50-59	Less than 2.0	1.0
F	Less than 50		0

Assignment Descriptions

1) **TITLE – E-mail Assignment**
   Brief Introduction

GOAL – To introduce yourself briefly to the instructor to facilitate course and assignment development.

PROCEDURE - In a few sentences, introduce yourself to the instructor via e-mail indicating your background, reasons for being in the diploma program, a brief description of your farm and 2 things you would like to learn in this course.

SUBMISSION GUIDELINES – Please forward this e-mail to rob.gulden@umanitoba.ca. Due date is listed in the table above.

EVALUATION CRITERIA - This assignment is worth 3% of the final grade.

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2) **TITLE** – **Written/Oral Assignment**

Developing a sustainable Herbicide Plan and Critical Evaluation and Improvement of on Farm Weed Management

GOAL - The purpose of this assignment is to improve the student's written and oral communication, problem solving, critical thinking and evaluation of the ability to integrate course materials into your own farm/future job.

PROCEDURE –

Written portion (due date is listed in table above)

List 5 of the most prominent weeds on your farm and develop a herbicide program to manage those weeds. Choose three major crops (include at least one grass and one broadleaf crop) you grow and develop two herbicide programs to manage these weeds in each crop. Diversify the herbicide program within crop and between crops as much as possible (groups/families/active ingredients/mixtures) to minimize the selection for herbicide resistant weeds. Justify your choices and what they are based on. All information for this can be found in the guide to crop protection.

Prepare a table as follows:

Crop:
Herbicide 1

Common name	A.I.(s)	Rate(s)/ac	Weeds controlled	App. Timing/ window	restrictions	$ / ac

Total cost/ acre:

Justification for this program:

Start a new row for each product. If you need to use multiple products / product mixtures for a program to manage the weeds in your field, use a new row for each product. Calculate the total cost per acre for each herbicide plan and provide a justification on why you chose each product/plan.

Oral portion (due date is listed in table above)
In a 10 min individual oral interview/discussion with the instructor (to be scheduled in March), each student will communicate answers to the following questions after providing a brief description of their farm (or provided scenario):

1) Given what you have learned in the course since you completed the assignment, do you see any major flaws/shortcomings in your herbicide plan.
2) How would you change your current plan(s) to improve its longevity and sustainability. What additional tools would you use to help herbicides maintain their efficacy?
3) How would you deal with herbicide resistance individually, how should we deal with it collectively?

For those who do not have access to a farm, please contact the instructor who will provide a scenario to you.

SUBMISSION GUIDELINES – The interviews will be held online using Webex by appointment only.

EVALUATION CRITERIA - Each question is given an equal weighting and the value of the assignment is 15% of the final grade (8% for the written, 7% for the oral). Failure to complete either part of the assignment will result in a grade of zero.

Assignment Grading Times

Grades for all assignments and exams completed before the voluntary withdrawal date will be available before that date.

Lab and Oral Assignment grades will be uploaded shortly after completion.

Assignment Extension and Late Submission Policy

Late assignments will receive a grade of zero.
Missed assignments will receive a grade of zero.