

WSU Wheat Academy – 2017

Course Titles & Descriptions

Title and Summary Received:

Who Wants Our Wheat? Dr. Craig Morris, Doug Engle, Dr. Alecia Kiszonas, and the Staff of the Western Wheat Quality Lab

Growers necessarily focus much of their attention on producing wheat and reducing risk. However, why do we grow wheat? Where does it go? Who wants it and what is it used for? This course will review the various market classes of wheat, what each is best used for and some of the technical aspects important to those who buy and use our wheat.

AgWeatherNet, Climate, and Washington Wheat, Nic Loyd

AgWeatherNet is a vital resource for the Washington Wheat Industry. The website (www.weather.wsu.edu) provides real-time and historical weather data for numerous locations across the state, and features several parameters, including (but not limited to) air temperature, rainfall, wind speed/direction, relative humidity, soil temperature, and solar radiation. A robust decision support system is also available, and includes various tools, models, decision aids, and publications, such as a Growing Degree Day Calculator, a Wheat Yield tool, and weekly weather outlooks. The past, present, and future of Washington's Climate in the context of normals, extremes, and variability will also be discussed. Finally, the methodology for preparing weather and climate predictions using dynamical and statistical models / tools will be detailed.

Variety Testing and Variety Selection, Ryan Higginbotham

The list of available wheat and barley varieties is long, and continually growing. Deciding which variety to plant can be a bit overwhelming. The Variety Testing and Variety Selection module will focus on the WSU Cereal Variety Testing Program (VTP). This module will provide an overview of the VTP; mission, vision, structure, testing procedures, etc. Participants will learn how to access and use VTP data and be provided with an in-depth tutorial on the interactive Variety Selection Tool. Discussion topics will include the strengths and weaknesses of variety testing, how to interpret data, and the different criteria for selecting varieties. Additionally, participants will be encouraged to provide feedback and suggestions on how the VTP can better meet their needs.

Large-Scale On-Farm Research Trials to Support Soil Fertility Management, Dr. Haiying Tao and Aaron Esser

Nutrient recommendations derived from large-scale, on-farm experiments using precision agriculture technologies, often result in higher net returns and reduced nutrient inputs. These types of experiments also allow us to collect 'big data' inexpensively to develop advanced agronomic models for wheat. The success of this research approach will lead to better N management with less uncertainty compared to current N recommendation methods, thereby increasing farm income, reducing N loss to the environment, improving soil health and sustainability, and increasing global food security for this important commodity. In this presentation, we will discuss how farmers can conduct on-farm trials in collaboration with WSU,

and how data can be collected and maps generated using yield monitors and protein monitors for post-harvest evaluations of N availability.

Disease & Disease Disorder Diagnostics, Rachel Bomberger

The first step to implementing a successful integrated pest management (IPM) program is the correct identification of the pest or problem. This course will focus on how to approach diagnosis to identify different groups such as pathogens and pests, and abiotic causes of plant problems. Key points covered will be patterns associated with biotic and abiotic problems; timing of different diseases and when symptoms appear; distinguishing characteristics of common diseases; and when and how to utilize the diagnostic lab for confirmation. Information about utilizing the Western Regional Small Grains Genotyping Lab and the Herbicide Resistance Testing program will also be discussed.

Identifying and Managing Insect Pests on the Farm, Dale Whaley and Dr. David Crowder

Insect pests can affect crops and have a serious impact on the economic output of a farm. However, not all insect pests are created equal and some cause more damage than others and some are not even “pests” at all! A cornerstone of successful pest management is regular scouting (monitoring) to identify and determine the extent of emerging pest threats. Why is monitoring for pest and beneficial insects so important? Because it is of utmost importance for farmers and pest managers to understand insect activity in their crops and fields before they can make cost-effective and environmentally sound pest management decisions. Being able to identify major pests quickly and correctly allows you more time to obtain and consider advice on the best control tactic should the pest reach treatable levels. One question is whether or not the damage potential is more costly than the control cost. The economic threshold plays an important role in management decisions and is defined as when there are enough pests present to warrant treating the crop.

Soil Health – What Are Your Plants Trying to Tell You? Paul Carter and Dr. Steve Van Vleet

This educational course will look at soil health concerns influencing crop production throughout the Inland PNW. The course will present/review information on evaluating soil test lab reports and learn the importance of essential soil nutrients and the associated plant deficiency symptoms. Participants will be expected to engage in group activities involving the analysis of soil test results with ancillary data to develop a 2018 farm field cropping/nutrient management plan. Learning objectives include: 1) knowing the essential nutrients for healthy plant development and production, and how soil pH affects nutrient availability, 2) recognizing the most likely plant nutrients to be deficient and the deficiency symptoms, and 3) developing a cropping plan using the tools available.

Fallow Weed Management in the Age of Glyphosate Resistance, Dr. Ian Burke and Dr. Drew Lyon

Fallow weed management is getting more complicated. Russian-thistle biotypes resistant to glyphosate, kochia biotypes resistant to dicamba, and prickly lettuce biotypes resistant to 2,4-D means that our heavy reliance on relatively inexpensive herbicides for weed control in fallow will soon be at an end. Weed management in fallow will require a more complete understanding of herbicide mechanisms of action, soil activity and longevity, and application techniques. It will

likely involve an iterative process to identify inputs in season. All of these aspects of fallow weed management will be presented and discussed to help attendees prepare for the rapidly changing landscape of fallow weed management in the PNW.

Design, Analysis, and Interpretation of Research Trials, Dr. David Crowder, Aaron Esser, and Ryan Higginbotham

Research trials are important for generating information that informs and educates growers and industry. However, not everyone knows what goes into the design and analysis of a research trial, or how to interpret trial results. Participants in this course will explore the basics of experimental design and learn how to set up a research trial. We'll help you understand the basic principles of statistics and how to utilize them when looking at trial results. You'll come away with a better understanding of how research trials are conducted, how to interpret and use trial results, and why not all trial results are useful.

Market Strategy Development, Dr. Randy Fortenbery

The Market Strategy Development module focuses on identifying and comparing specific marketing objectives and strategies under different market conditions. We will examine how to incorporate market outlook projections with current price activity to estimate price risks, and how those risks might translate into pricing opportunities going forward. The pros and cons of different marketing strategies under different risk scenarios will be examined, including evaluating whether storage or delayed pricing is likely to be attractive in any given year.

Effect of Soil pH on Wheat Diseases, Dr. Tim Murray

Increasing acidity of agricultural soils as a result of long-term nitrogen fertilization has been of concern in eastern Washington and northern Idaho for more than 30 years. Soil pH in the top 6" of many soils in the region has fallen below 5.2 and is at a point where crop yields are being impacted. Soil acidity influences plant growth and productivity in different ways including the availability of nutrients and the occurrence and severity of some plant diseases. The impact of soil pH on wheat diseases that are prevalent in the Inland Pacific Northwest will be discussed, along with management options, so attendees will have a better understanding of the current situation.

Thinking Outside the Crop Rotation Box; Planning for Oilseeds & Companion Crops, Dr. Diana Roberts and Karen Sowers

Even if you never saw a canola field in bloom before, you likely did in 2017 with a record 200,000 acres of the crop grown in the Pacific Northwest! Producers and crop consultants also want to include companion crops or cover crops in their rotation. We will go through a 10-step planning process that begins with the question, "How might including canola or companion crops in my wheat rotation improve the soil and/or help manage pests/diseases/weeds – and ultimately improve farm income?" There is not one 'right' answer, as it is situation and farm-dependent. Using live plants, participants will diagnose and provide solutions to production issues. They will also develop a companion cropping scheme, which is specific to their area and includes desired soil benefits, species selection, seed treatment, seeding, and crop termination plans.

Wheat Breeding v2.017: New Tools to Support Variety Genetic Improvement, Dr. Arron Carter and Dr. Michael Pumphrey

Since the first wheat breeder started at WSU over 120 years ago, the objectives of the breeding programs have not changed much. Wheat breeders are still looking for high yielding lines, with resistance to abiotic and biotic stresses, that can return the highest economic return to the growers in the most sustainable system. What has changed over the past century is the tools and methods used to develop and select these new varieties. This course will discuss the new technologies used by the WSU wheat breeders to select breeding lines for advancement to released varieties. Some topics will include DNA marker-assisted selection, DNA sequencing, and doubled-haploid production. Additional discussion and demonstrations will be based on high-throughput phenotyping. Come see the cameras, sensors, and equipment used to collect data on hundreds of plots in the breeding programs. You'll come away with a better understanding of the technologies used by the breeding programs to select high-performing cultivars that are grown on your farms!