Partners in Progress
OILSEED

Oilseed Research at OSU 2017

Supported by the

Oklahoma Oilseed Commission

Oklahoma State University
Division of Agricultural Sciences and Natural Resources
Oklahoma Agricultural Experiment Station
Oklahoma Cooperative Extension Service

In cooperation with the
U.S. Department of Agriculture - Agricultural Research Service

P-1051

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Table of Contents

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Foreword

We have had a partnership with the Oklahoma Oilseed Commission and the oilseed producers of this state. There have been good times and bad times in terms of state budget restraints, shifts in oilseed production locations in the state and changes in the federal oilseed program. Together, we have survived and are looking forward to a brighter future.

Our *Oilseed Research at OSU 2017* report serves as a means to highlight significant accomplishments in research and Extension programs that have been supported in partnership with the OOC.

With all of the work accomplished, it is important to recognize much more research and Extension programming needs to be done to keep our oilseed producers competitive and in business. Therefore, our work must be focused on solving meaningful issue-based problems facing the oilseed producers in Oklahoma.

This report is one means of being accountable for the funds we have received and communicating the latest results of our programs to oilseed producers as rapidly as possible.

Keith Owens
Associate Vice President
Oklahoma Agricultural Experiment Station
Division of Agricultural Sciences and Natural Resources
Oklahoma State University

Oklahoma State University Division of Agricultural Sciences and Natural Resources Mission Statement

The mission of the Oklahoma State University Division of Agricultural Sciences and Natural Resources is to discover, develop, disseminate and preserve knowledge needed to enhance the productivity, profitability and sustainability of agriculture; conserve and improve natural resources; improve the health and well-being of all segments of our society; and to instill in its students the intellectual curiosity, discernment, knowledge and skills needed for their individual development and contribution to society.

A Partnership

Southwest Oklahoma Canola Growing Conditions and Crop Results

In fall 2016, southwest Oklahoma canola growers had favorable soil moisture conditions for planting during the narrow Sept. 10 to Oct. 10 establishment window. Planting got off to a good start but in some areas field work was interrupted by too much rain.

Planting was followed by very warm temperatures throughout October and November. Even in late-planted fields, the crop reached an acceptable plant size before the first hard freeze and the plants began entering winter dormancy. In some fields, there was excessive top growth and concern this could negatively impact winter survival.

Late fall temperatures were adequate to acclimate the plants ahead of the arrival of low winter temperatures. Air temperatures dropped gradually over time, allowing the plants to transition for winter conditions.

Northern Oklahoma Canola Growing Conditions and Crop Results

Exceptional soil moisture conditions during mid-September encouraged growers to get into the field early in the planting window. Warm temperatures in November promoted abundant top growth.

Early fall conditions were favorable but soon thereafter, very dry weather started encroaching on the region. Rainfall amounts at Kingfisher in the heart of canola country offer evidence of just how dry conditions were. Only 1.55 inches of rain were received at the local Mesonet site during October, November and December 2016.

Even under very dry conditions, by December, early seeded fields were producing excessive top growth. Later-planted fields developed to the point where winter survival would not be a major concern. The commencement of cooler temperatures was welcomed as these conditions acclimated the crop for the winter months.

General Observations for All Regions

The new year brought more concerns as warmer than normal temperatures prevailed and canola started coming out of winter dormancy very early as temperatures hit a high of 90 F in early February. The early arrival of high temperatures was concerning but fortunately temperatures did moderate somewhat. Daytime temperatures in the 70s F relieved some stress on the crop. Mostly moderate temperatures and good rainfall amounts persisted throughout the spring and both were beneficial to crop maturation and seed ripening.

Harvest season started early with swathing beginning in mid-May. Only modest amounts of rain were received from mid-May to mid-June and harvest was plagued by few weather delays. Oklahoma produced an average crop in 2017. High temperatures soon after the start of the new year caused the canola plants to come out of dormancy prematurely and to begin reproductive stages too early to produce high yields. The canola plant mass required for high yields never developed in 2017. Some growers reported yields in the 35 to 40

bushels per acre range, but there were also many reports of 20 to 25 bushels per acre. Oklahoma State University researchers reported some exceptional plot yields of up to 100 bushels per acre, but reports from growers of yields of 50 bushels per acre or more were rare. Prices received by growers were very similar to those of 2016.

The market continues to signal a strong future demand for U.S. canola. Indications are that fall 2017 plantings will be similar to those of last year.

A Partnership

Establishing an oilseed industry in Oklahoma continues to be a challenging endeavor. The ongoing, mutually beneficial partnership between growers and their state land-grant university is essential in making that industry a reality. Through checkoff dollars collected on oilseed sales, growers support the oilseed research and Extension programs at OSU, thus investing in their own prosperity. As state and federal government budgets shrink, grower support for research and outreach is even more critical.

Historically, the Oklahoma Oilseed Commission has contributed more than half of the checkoff funds collected each year to support research and Extension programs at OSU. In 2016-17, OOC provided $20,000 in funding to OSU for oilseed research and Extension programs. The commission and growers are very appreciative of OSU's commitment to sustaining research and education efforts during this fiscally challenging period. The commission is committed to the future of the industry and will provide additional research and education funds as they become available.

The results of OSU's 2016-17 research and education efforts on canola are contained in the following pages. This report reflects the productive relationship between Oklahoma oilseed growers and the university. Oklahoma's oilseed producers are proud to partner with OSU and therefore to be partners in progress.

Ron Sholar
Executive Director
Oklahoma Oilseed Commission

Field Demonstration of Commercially Available Canola Varieties and Hybrids in Oklahoma

Josh Lofton
Department of Plant and Soil Sciences

2016 – 2017 progress made possible through OOC support

- **Establish demonstration trials of commercially available winter canola cultivars to encourage grower interest in canola production by utilizing the trials as an educational tool and building on the canola culture within the state. By implementing these trials, the visual presence of successful canola production should assist in increasing canola acreage in Oklahoma as well as improving grower understanding and knowledge of winter canola production.**

Demonstrations

A total of five demonstrations were established in the fall of 2015. Three demonstrations were established under the guidance of Josh Bushong in the north-central and northwest regions at Guthrie, Blackwell and Okeene. An additional two demonstrations were established in the southwest regions under the guidance of Heath Sanders, located at Hobart and Walters. An additional trial was located in Southwest Oklahoma, but did not establish. Eight glyphosate-resistant winter canola cultivars were evaluated at all locations. Glyphosate-tolerant cultivars were selected as these were field scale demonstrations integrated within producers' fields and as most producers in Oklahoma continue to grow glyphosate-tolerant cultivars, the PIs did not want to have crop failure due to over-the-top applications of glyphosate in-season. All strips within the demonstration were planted using the producers' field equipment and were the length of the field. Therefore, many of these strips ranged from 30 to 60 feet in width and were often a quarter to a half-mile long.

At all five locations, spring field tours were held. These tours were some of the most widely attended in the regions in which they were held. A total of 51 growers and stakeholders visited these five locations. In addition to standard cultivar evaluation, several of these trials had an added component. One of the best examples of this was the field demonstration at Guthrie. At this location, within the farmer-planted strip, a section did not have any in-furrow nutrients, while the remainder of the strip contained nitrogen and phosphorus in-furrow nutrients. During flowering, the difference between applied and nonapplied strips was evident. This

was a main talking point during the field tours and many growers were able to see the benefit of in-furrow fertility. The picture above highlights these differences.

Unfortunately, many of the locations did not get harvested for various reasons, including weather, low yields and error. The location at Blackwell was harvested and the yield for the associated trial is shown in Table 1.

Overall, yields for the demonstration were lower than those for the small plot trials near Pond Creek, but these yields were more consistent for what a majority of growers achieved during the 2015-16 season. For DKW 46-15, DKW 45-25 and Croplan 115, there was an agreement in yield potential compared to other varieties tested between the small plot trials and the large scale demonstrations. However, P46W94 and Croplan 225 had major disagreement between the two trial sizes. These demonstrations highlight these small plot trials do provide valuable information on how well these cultivars will respond when growers plant them across their fields. There are certain circumstances, such as high winter kill or areas of the field that have better quality, that could indicate higher or lower yield potential that would not be seen across several hundred acres. However, these small plot trials still provide growers a tool to aid in cultivar selection as long as growers are using them as part of the cultivar selection decision process and not the sole tool.

Table 1.

Cultivar	Yield (lbs./a)	(lbs./a)	Percent of Average Demonstration	Percent of Average Small Plot
DKW 44-10	1,386	28	110	101
DKW 46-15	1,384	28	110	109
DKW 45-25	1,270	25	101	99
DKW 41-10	1,175	23	93	-
P46W94	1,265	25	101	82
Star 915W	1,124	22	89	99
Croplan 225	1,031	21	82	104
Croplan 115	1,423	28	113	107

Chemical Weed Management Systems in Oklahoma Winter Canola

Misha Manuchehri and Josh Lofton
Department of Plant and Soil Sciences

Production

Currently, there are eight herbicides and five modes of actions labeled for use in winter canola, including herbicides that can be used in Roundup Ready and Clearfield systems. As a result of the limited number of products available, absence of preemergence herbicides and increase in herbicide resistant weeds, weed management in canola is challenging. To assess potential PRE options in Oklahoma winter canola, two field trials were established during the 2016-17 field season in Stillwater and Lahoma to evaluate winter canola tolerance to Command, or clomazone, and Dual Magnum, or S-metolachlor.

The objective of this study is as follows: Evaluate the tolerance of winter canola in Oklahoma to varying rates of clomazone and S-metolachlor applied alone and in combination.

Material and Methods

All trials were arranged in a randomized complete block design with four replications. Following planting, clomazone and S-metolachlor were applied alone or in combination. Clomazone and S-metolachlor were applied at 3.5, 4, 4.5 or 7 fluid ounces per acre. Treatments were applied using a CO_2-pressurized backpack sprayer calibrated to deliver 10 gallons per acre. Total crop injury was recorded 3, 4, 5 and 8 weeks after planting. Data sets were analyzed using PROC MIXED with pdmix 800 macro included. Means were separated using Fisher's Protected LSD at p=0.05.

Results and Discussion

Three WAP in Stillwater, all treatments that included clomazone, regardless of herbicide rate, injured canola 11 to 50 percent (Figure 1). Injured

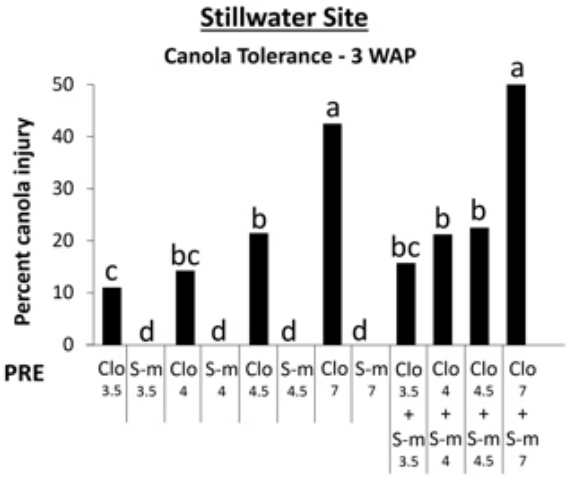

Figure 1. Percent canola injury following clomazone (Clo) and S-metolachlor (S-m) applications alone and in combination in Stillwater. Rates, in fluid ounces per acre, are listed below herbicide names.

Figure 2. Clomazone injury on winter canola.

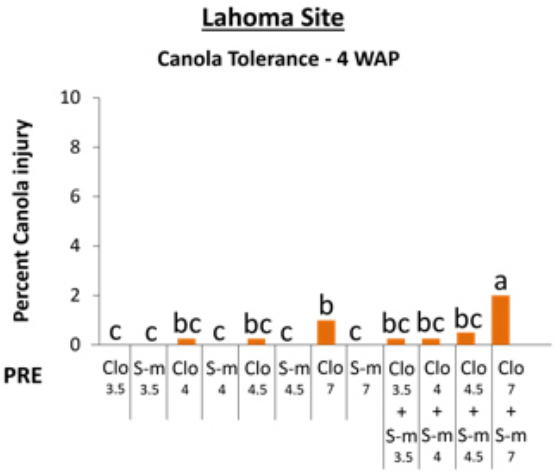

Figure 3. Percent canola injury following clomazone (Clo) and S-metolachlor (S-m) applications alone and in combination in Lahoma. Rates, in fluid ounces per acre, are listed below herbicide names.

plants were bleached along leaf margins (Figure 2). By five weeks after planting, canola injury was 11 to 36 percent for all treatments that included clomazone with the exception of clomazone applied at 3.5 fluid ounces per acre alone or in a tank mixture with S-metolachlor at 3.5 fluid ounces per acre. For these treatments, no injury was observed.

Three weeks after planting in Lahoma, canola injury was less than 4 percent for all treatments with the greatest injury occurring at the highest rate of clomazone applied alone or in combination with S-metolachlor at 7 fluid ounces per acre.

Four weeks after planting in Lahoma, crop injury was 2 percent or less for all treatments (Figure 3). Increased canola injury from clomazone at the Stillwater site was likely attributed to colder temperatures that followed a later planting date. Significant rains at the Lahoma site likely moved herbicides to soil depths beneath the canola root zone, resulting in minimal crop injury. S-metolachlor applied alone, regardless of location or application rate, resulted in less than 1 percent canola injury.


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