

Shortened canola planting periods: Most recent results

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The normal recommendation for canola plantings is to ensure that there are at least three years between plantings in the same field. The main reason for this recommendation is possible disease problems. Within the Riversdal crop rotation trials it was decided to look at shorter planting periods over a longer term, and specifically at yield and its impact on the systems' economy.

In 2012, the trials changed from testing the order of different crops after lucerne to testing cash crop systems. Six systems are currently being tested at Riversdal, although in this article we only focus on the systems that include canola. The different systems are indicated in Table 1. A note is included that indicates whether it can be classified as a shortened withholding period system with regard to canola cultivation.

The question now arises why the WLWC system is classified as short. The answer is contained in the occurrence of possible disease hosts – in this case, lupins may be a possible host for *Sclerotinia*, among others. Even the five-year system has lupins as rotation crop and is therefore regarded as medium (according to plant pathologists).

Table 1: Description of crop rotation systems in Riversdal.

System	System crops	Short rotation
WC	Wheat-canola	Ultra-short
WLWC	Wheat-lupins-wheat-canola	Short
WCC	Wheat-cover crop-canola	Short
WBC	Wheat-barley-canola	Short
BLWWC	Barley-lupins-wheat-wheat-canola	Medium

Table 2: Annual and average canola yield in the Riversdal crop rotation trial.

System	2013	2014	2015	2016	2017	Average
WC	2,81	1,29	1,35	2,28	1,13	1,77
WLWC	2,16	1,46	1,52		0,96	1,53
WCC	2,77	1,51	1,74	2,79	1,25	2,01
WBC	2,29	1,51	1,16	1,86	1,07	1,25
BLWWC	2,14	1,37	1,36	2,17	1,04	1,69

Blackleg is still an important disease in canola production. Fortunately, there are many good cultivars with resistance available, as well as agronomical practices with regard to preventative disease control using chemicals. The last few years, though, saw the emergence of *Sclerotinia* that caused quite a lot of damage, especially in the Southern Cape. In this article we also look at the effect of this disease on the various systems.

Canola yield

The average canola yield is indicated in Table 2. We compare the yield data obtained over the past five years for canola between the five different systems. Bear in mind that the different crops for each system is present each year and the indicated yield is the average value of three repetitions.

Over the five-year period, the average canola yield within the ultra-short rotation system (WC) compares well with the other systems, although there was a slump in the yield from 2013 to 2015. This slump was probably due to the occurrence of *Sclerotinia* (as can be seen in the next section).

After these observations, as described here, we started preventative spraying against *Sclerotinia*, which had a positive effect. We believe the system must be managed very carefully to limit the effect of diseases within the ultra-short and short rotation systems. It appears as though it can be successful.

As researcher, I would like to see the system tested in more areas before a general recommendation is made. Also of importance is the

Figure 1: History of *Sclerotinia* in the crop rotation system trial.

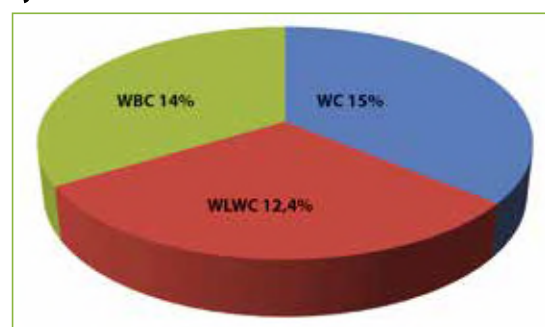


Figure 2: Contribution of different crops to the gross margin of their particular systems in each year, and the average over time.

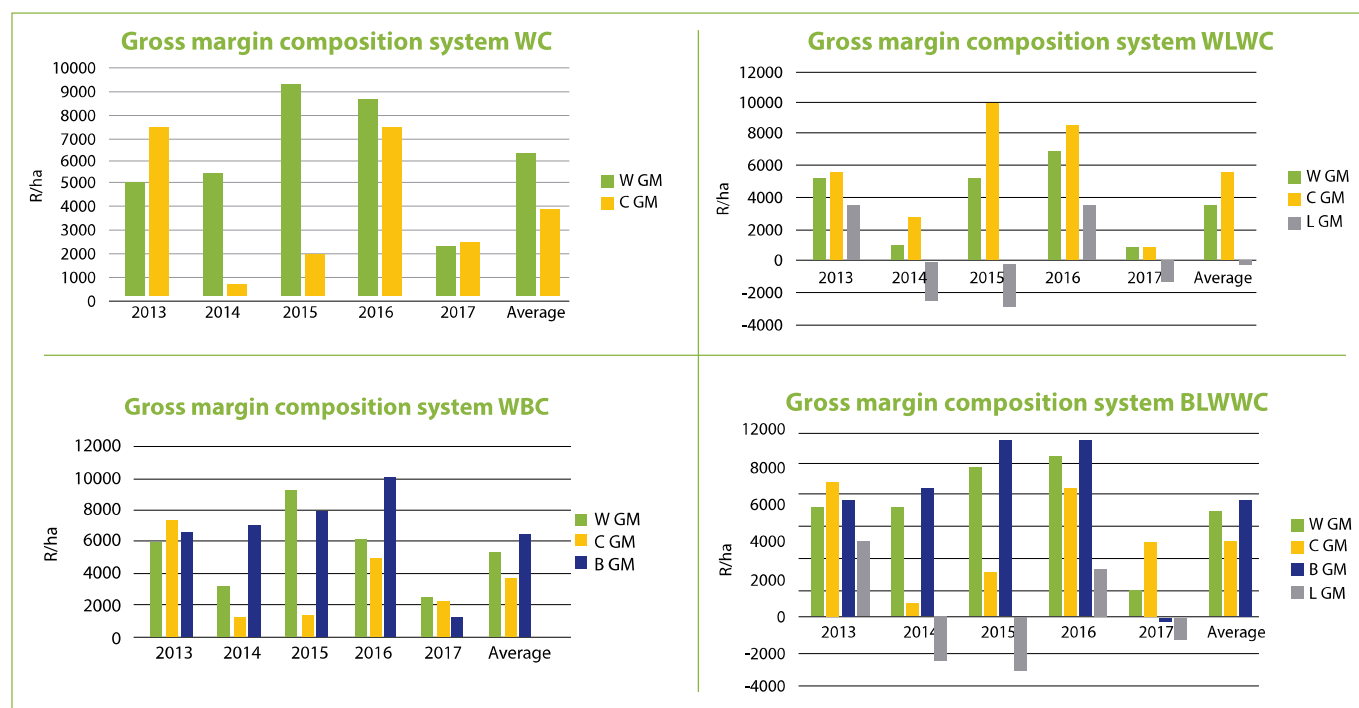


Table 3: Average system gross margin in rand per ha for the period 2013 to 2017 for each system where canola is cultivated, excluding the system that includes cover crops.

System	2013	2014	2015	2016	2017	Average
WC	6 193	2 555	5 598	8 050	2 318	4 943
WLWC	5 300	1 173	5 113	6 919	599	3 821
WBC	6 654	3 792	6 166	7 038	1 968	5 124
BLWWC	5 567	2 805	4 975	7 157	1 112	4 323

(C = canola, W = wheat, L = lupins, and B = barley)

canola’s performance after the cover crop; the canola was planted after a legume cover crop each time.

Sclerotinia stem rot

Since 2013, three different rotation systems, namely wheat-canola (WC), wheat-lupins-wheat-canola (WLWC) and wheat-barley-canola (WBC), have been monitored for *Sclerotinia* stem rot. These three systems are compared with each other in Figure 1 over the 2013 to 2016 seasons.

Over the whole monitoring period the ultra-short rotation system showed the highest infestation figure. The data for the four years were statistically analysed (ANOVA) and the result is that there were no significant

differences between the systems.

In 2016, the other two systems that also contain canola were added to the *Sclerotinia* monitoring project. Statistically the WC, WLWC and BLWWC systems had significantly more *Sclerotinia* infestation in 2016 than the WCC and WBC systems.

System gross margin

The average gross margin of each system is shown in Table 3. It appears from this data that the ultra-short system, compared to some of the other systems, performs excellently. It should be remembered, however, that the WCC system cannot be applied as cash crop system as is, because the inclusion of a cover crop causes a decline in the average gross margin of such a short system.

Despite this, the canola planted after the legume cover crop performs much better in terms of yield. We also provide less top dressing to the canola compared to other systems. One of the biggest disadvantages of the system is the contribution of lupins. The yields were almost non-existent or very low in various seasons, with a resulting negative effect on the eventual gross margin.

For a more complete picture, the contribution of each crop to the gross margin within each system is indicated in Figure 2.

In conclusion

The shortened canola production systems show good potential but will require very good management to control the possible negative effect of diseases. This data was collected over a five-year period, which is relatively short. It will be interesting to see if the conclusions made can be maintained in the long term.

Alternating cultivars (thus different genetic resistance sources) and chemicals to control blackleg is currently a very good option. In the case of *Sclerotinia*, only the chemical route is available as a preventative control option. 🌱