1000 UTB Universal 650 tractors awaiting shipment to Africa.
(IMJ archives)

market was personally selected by their own technicians and was then more or less completely rebuilt and tested, prior to being shipped.

Joe Jardin being aware of this procedure, prudently arranged for the Australian bound tractors to receive this same special treatment by the Americans. As a result, Farmliner tractors in Australia retailed by Inland 4 Wheel Drive Pty. Ltd., Chelmsford Farm Machinery and others, were highly regarded and enjoyed volume sales.

Since the collapse of the communist regime in 1989–90 the factory changed hands and tractor production rapidly declined. In 2007 a shopping centre was planned to be built on the site.

The new Series 3 UTB (Farmliner)

Following a lunch consisting of a mug of black tea and a crusty biscuit, it was time for me to inspect the adequacy of the new model tractor for the Australian market.

Accompanied by a small team of departmental chiefs, I was escorted to an outside compound, into which an example of the new tractor awaited. All eyes were upon me as I slowly scrutinised the smart looking machine. I then pulled myself up into the driving seat and surveyed the layout of the controls and instruments. A few points of disapproval occurred to me, so I beckoned to a technical fellow, attired in a white dustcoat, and through my interpreter explained to him the reasons for my concern. He listened carefully, nodding his head in agreement, before entering the details in a notebook.

He then invited me to start the engine. A bad decision as it turned out! Having ascertained the transmission was in neutral, I inched the rev leaver slightly forward and turned the key. The big diesel immediately turned over – but the engine failed to start! Following a further three attempts, the engine refused to start.

I noted the Securitaté character frowning.

The white coated bloke suggested I must have the stop lever pulled out. It was my turn to frown at the very suggestion, but refrained from pointing out that I was in fact familiar with correct starting procedures and no, the stop lever was not pulled out!

I alighted from the tractor and invited him to have a go.

He climbed aloft and with a superior smile turned the key. Nothing! He tried again. Nothing! I noted the accompanying executives were obviously concerned and the Securitaté guy was furiously writing in his notebook.

The new 1990 Model 643 Farmliner operating a Shearer baler.
(PHOTO: IMJ)

A discussion took place and a mechanic was summoned. The tractor still would not start! I apologetically suggested maybe it was out of fuel. I was greeted with a look of disdain. But I insisted upon climbing up and, upon unscrewing the fuel tank bung, observed the tank was bone dry!

The Securitaté cove scribbled rapidly in his notebook and glared at the visibly shaking white coated technician. The executive team all looked embarrassed, and also glared accusingly at the unfortunate individual. I am not sure if he was actually taken out and shot! (Remember – this was communist Romania).

Later in the afternoon I was able to field test the new Series 3 and to declare it was eminently suited to the Australian market.

The following day, together with Margery, I gratefully pointed the nose of our car towards the Hungarian border on the first leg of our journey back to freedom. ■

IAN'S MYSTERY TRACTOR QUIZ

Question: Can you identify this remarkable tractor?

Clue: If you are an elderly Italian farmer, you may be able to identify it.

Difficulty: This is a humdinger!

Answer: See page 48.

(PHOTO: IMJ)

Narrow crop rows, delayed black oats emergence and weed control

By Bhagirath S. Chauhan, Associate Professor, QAAFI, University of Queensland

AT A GLANCE…

- Two dominant species of black oats exist in the grain cropping systems of Australia.
- The use of narrow rows (25 cm) in wheat will provide greater suppression of growth and seed production of black oats compared with wide rows (50 cm).
- Irrespective of row spacing, delaying emergence of black oats will greatly reduce their growth and seed production.
- Both components – narrow rows and delayed weed emergence – should be included in integrated weed management programs in wheat.
- Both species of black oats have different seed shattering levels, which have implications for harvest weed seed control practices.

BLACK oats or wild oats are problematic weed species in winter crops. They are highly competitive and can reduce crop yield significantly. Nationally, they are ranked as our number 3 problem weed infestating over 2 million hectares and causing large revenue losses. In the northern grain region of Australia, black oats are ranked at nunber 1 and infest over 0.6 million hectares. They produce a lot of seeds (more than 20,000 per m^2) with differential levels of dormancy, which allows them to emerge in the field at different times.

Bhagirath Chauhan.

There are two main species of black oats that infest Australian grain cropping systems – *Avena fatua* (AF) and *Avena ludoviciana* (AL). AF tends to germinate and shatter earlier. It is difficult to distinguish seedlings of these species; but they can be properly identified at seed maturity.

AL spikelets tend to hold together at maturity while AF spikelets readily break into individual seeds (see Figure 1 photo).

Herbicides are widely used to manage black oats (the name used for both AF and AL) in cereals; but injudicious use of herbicides has been accompanied with the evolution of resistance. In Australia, some biotypes of black oats have already developed resistance to Group A, B and Z herbicides.

These concerns warrant the need to develop cultural weed management programs (for example, the use of narrow crop rows and high crop density) for black oats.

In some regions, wheat is grown at very wide row spacings (up to 50 cm), even in irrigated conditions. The big 'open' space between the rows is prone to heavy weed infestations and black oats in such situations may produce high biomass and seeds.

The use of narrow row spacing may lead to reduced black oats growth and seed production.

Cultural methods, including the use of narrow crop rows, allow weeds to germinate and emerge in the field at different times after crop planting. Black oats emerging at different times may have differential growth and seed production. Seedlings emerging later in the crop are usually less competitive and produce fewer seeds than seedlings emerging with the crop.

Harvest weed seed control practices have the potential to reduce the size of weed seed banks. AF and AL are known to have different seed shattering traits, which may have implications for their management.

A field study was conducted to evaluate the effect of crop row spacing and delayed emergence of black oats on growth and seed production of black oats (AF and AL) in a wheat crop.

FIGURE 1: Spikelets of *Avena ludoviciana* (left two seeds) and *Avena fatua* (right two)

How we did the trial

A field trial was conducted during the winter season of 2018 at the Gatton research farm of the University of Queensland. The trial determined growth, seed production and seed shattering of AF and AL emerging at five different times (0, 2, 4, 6 and 8 weeks after wheat emergence – WAWE) in wheat planted at 25 and 50 cm row spacing. Spitfire wheat was planted at 125 seeds per m^2 and the plant density was similar in both row spacing treatments. Black oats seeds were planted in small pots and eight seedlings per two m^2 area were transplanted at the two-leaf stage. Total seeds and shattered seeds per plant were counted.

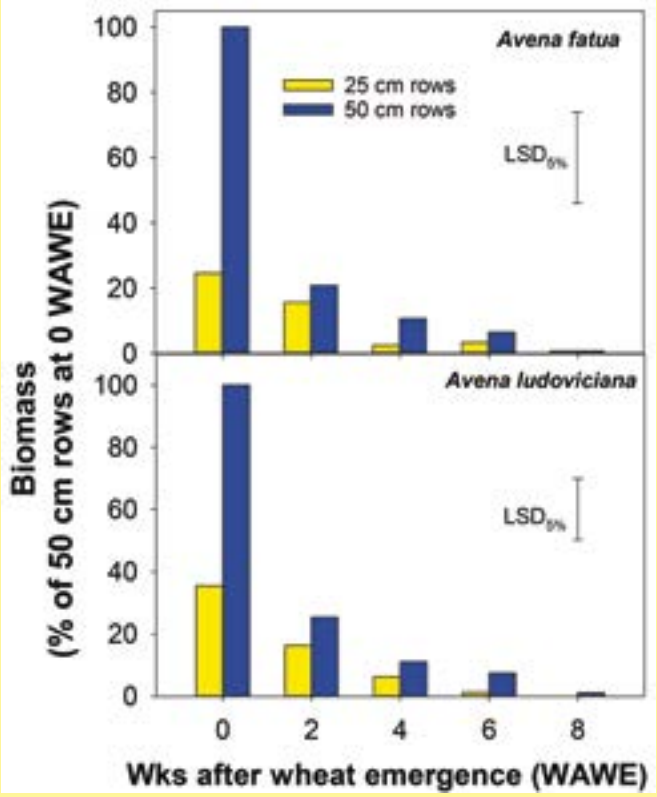
Plants were then cut at the ground level, placed in paper bags and dried in an oven at 70°C for three days and dry biomass determined. As black oats biomass and seed production were maximum at 0 WAWE in the 50 cm row treatment, the parameters are presented as the per cent of 50 cm rows at 0 WAWE.

Seed shattering data are presented only for the black oats seedlings emerging with the crop. GenStat was used to compare the means using the least significant difference test at the 5 per cent level of significance (LSD 5 per cent).

What we found

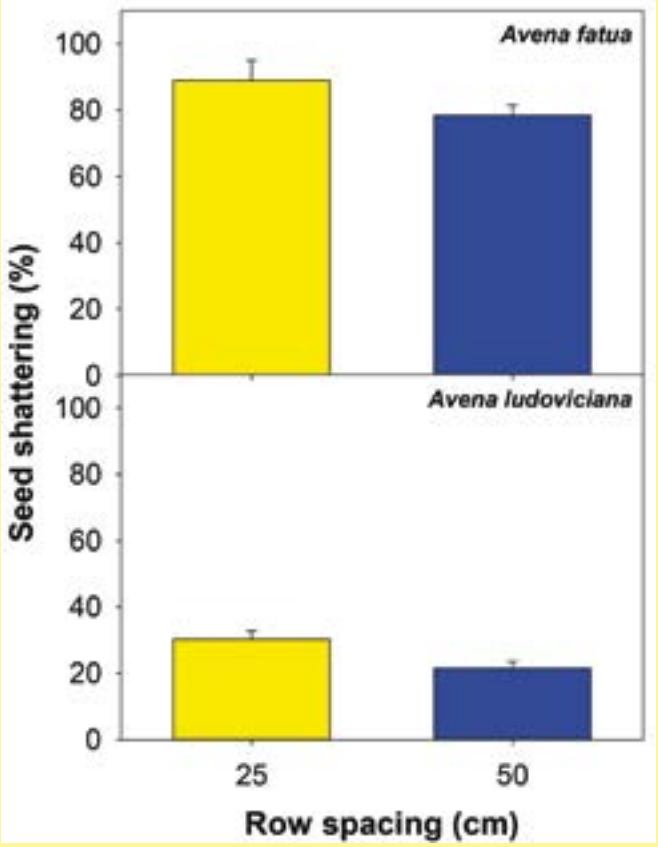
Both species of black oats (AF and AL) emerging with the crop had greater biomass (Figure 2) under 50-cm rows. But row spacing had no effect on biomass of plants emerging later than

FIGURE 2: Shoot biomass of *Avena fatua* and *A. ludoviciana* as influenced by wheat row spacing (25 and 50 cm) and weed emergence time



LSD5 % is shown for the interaction between row spacing and black oats emergence time.

FIGURE 3: Effect of 25 and 50 cm wheat row spacing on seed shattering of *Avena fatua* and *A. ludoviciana* when emerged with the crop



Error bars are the standard error of the means.

2 WAWE and beyond) in the crop. When emerged with the crop, AF produced only 25 per cent of the biomass in 25 cm rows compared with 50 cm rows. This value for AL was 36 per cent.

Similar to the biomass data, both species emerging with the crop had greater seed production under 50 cm rows and row spacing had no effect on seed production of plants emerging later in the crop. When emerged with the crop, AF produced only 32 per cent seeds in 25 cm rows compared with 50 cm rows (640 seeds per plant). This reduction for AL was 42 per cent in 25 cm rows compared with 50 cm rows (490 seeds per plant).

Black oats plants that emerged 8 WAWE produced 11–14 seeds per plant in 50-cm rows, whereas only two to four seeds per plant were produced by these plants in 25-cm rows.

At harvest, higher seed shattering/dispersal (78–89 per cent) was observed for *A. fatua* compared with *A. ludoviciana* (22–30 per cent) for the plants emerging with the crop (Figure 3).

What does this tell us?

This field trial found that growth and seed production of both species of black oats emerging with the wheat crop were greater in 50 cm rows than in 25 cm rows, demonstrating the importance of using narrow rows for wheat. The seed production data suggest that black oats plants that escape the application of a pre-emergence herbicide may produce about 70 per cent more seeds in 50 cm rows compared with 25 cm rows.

In a wide row crop, some herbicides cannot be incorporated well by sowing operations as the space is very wide between the rows and this may result in the escape of black oats seedlings.

Irrespective of row spacing, delaying black oats emergence until 2 WAWE greatly reduced growth and seed production compared with the plants that emerged with the crop. Late emerging black oats seedlings might have suffered more from shading than early emerged seedlings.

The results suggest the importance of planting a wheat crop in a weed-free field condition, which could be achieved by using a pre-emergence herbicide. Irrespective of row spacing, black oats plants emerging 8 WAWE produced only 0.4–2.7 per cent biomass compared with the weed plants emerging with the crop.

These late emerging plants may not affect crop yield but they still produced two to four seeds per plant in 25 cm rows and 11–14 seeds per plant in 50 cm rows. These seeds may build up a large seed bank in the subsequent seasons. Black oats seeds are known to spread through farm machinery and these seeds may infest a clean area. The issue may become more serious if the plants are herbicide-resistant. Growers need to aim for a 'no seed threshold', especially in a situation where black oats are not a serious problem.

The seed shattering data suggest that AL could be targeted using harvest weed control practices but most seeds of AF may escape these control techniques. Researchers need to think if there is a possibility of reducing seed shattering in black oats.

This study concludes that narrow row spacing and early black oats control could be important components of integrated weed management programs in wheat. For black oats management, future research should focus on integration of cultural approaches (row spacing, plant density, weed-competitive cultivars, etc.) with herbicide application timing. Although highly unlikely, efficacy of a herbicide may vary on AF and AL. So there is a need to evaluate the performance of different herbicides on AF and AL. ■