

ASK AN EXPERT – DOES CHAFF IN A CHAFF LINE SUPPRESS WEEDS?

□ With Annie Ruttledge, weeds researcher, DAF, Queensland

IN the wake of rapid adoption of chaff lining – the newest harvest weed seed control tool developed by Australian farmers, a substantial research effort has been made to validate the efficacy of this practice.

Chaff lining involves depositing weed seed-laden chaff in a narrow line behind the header. Some growers using this practice have suggested that as the chaff in the chaff line rots away, much of the weed seed also decays in the process. Researchers have now gained a deeper understanding of what happens to weed seed in a chaff line.

Department of Agriculture and Fisheries, Queensland weeds researcher Dr Annie Ruttledge and several collaborating scientists have been looking into different aspects of weed seed decay and weed suppression in the chaff line.

“Non-herbicide tools like chaff lining are very important to help manage the onset and spread of herbicide resistance in weeds,” says Annie. “The idea with harvest weed seed control tactics is to collect any weed seed present at harvest height – usually above 15 cm. With chaff lining, these weed seeds are deposited in a narrow line of chaff behind the harvester.

“Burial in the chaff line can suppress emergence in some weed species, but it does not guarantee that no weeds will emerge from chaff lines,” she says. “Harvest weed seed control tools like chaff lining and chaff tramlining concentrate the weed seed into confined zones where emergence can be monitored and action taken as required, without treating the whole paddock.”

Does the chaff line suppress weed emergence?

Short answer: Yes, if the weed seed is buried deeply enough in the chaff. Many weeds in no-till and reduced-till farming systems prefer to germinate on the surface where there is plenty of light.

Longer answer: Our trials investigated the effect of chaff on germination rates of annual ryegrass and common sowthistle. The sowthistle seed was more readily prevented from emerging than annual ryegrass seed, probably due to the different requirements of the species for light. Maximum suppression of annual ryegrass emergence was achieved with a chaff load of 42 tonnes per hectare, which can be feasibly produced in a 3.5 tonnes per hectare cereal crop. In contrast a chaff load of just 12 tonnes per hectare of wheat chaff was sufficient to suppress emergence of common sowthistle seed.

Work done by our collaborator Dr John Broster (Charles Sturt University), found that chaff from cereal crops generally provided better suppression of annual ryegrass compared to canola and pulse chaff.

For all chaff types the higher the rate per hectare the better the suppression.

What's the difference in suppression in chaff lines compared to chaff tramlines?

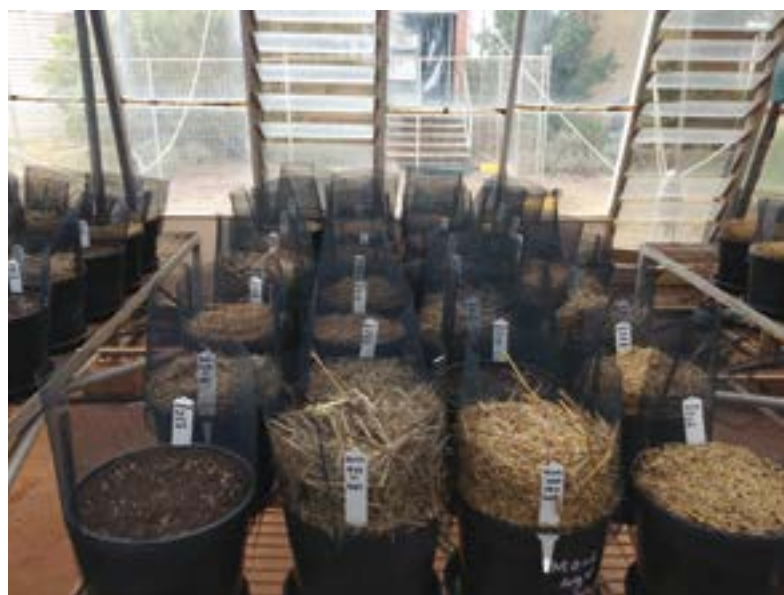
Short answer: Chaff tramlining effectively halves the amount of chaff in each line, potentially reducing the suppressive potential of the chaff.

Longer answer: Placing a single line of chaff behind the harvester (or directing all the chaff from a chaff deck into one tramline) maximises the amount of chaff and therefore the level of weed suppression. Different crop types, sowing rates and crop yield all influence the quantity of chaff produced.

In addition to looking at suppression of emergence, we looked at weed seed decay under field conditions. In these trials there was no evidence that weed seeds rotted more rapidly in a chaff line than on the soil surface. But we expect that environmental conditions play a large part in weed seed decay. So the results could vary according to season, with more rotting likely in a wet year than in a dry year. The depth and persistence of chaff



Dr Annie Ruttledge, DAF Queensland weeds researcher, has been investigating weed emergence from chaff lines.



One of the experiments involved determining the level of chaff required to effectively suppress emergence of annual ryegrass and common sowthistle.