

NATIONAL HAY AGRONOMY – PGR EFFECT ON 2019 HAY PRODUCTION

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TAKE HOME MESSAGES

- Hay yield and height was reduced by PGR Moddus Evo® application.
- Stem thickness and lodging was not influenced by PGR application in 2019 due to the dry finish.

BACKGROUND

The National Oat Breeding Program variety trials in Victoria are conducted annually, but there has been little recent evaluation of agronomic practices beneficial for hay production. A practice that needs field assessment is the use of a plant growth regulator (PGR) to manage hay production. PGR application is intended to reduce the internode length, shortening plant height and increasing straw strength, to reduce the likelihood of lodging which is detrimental to hay making logistics and quality.

The National Hay Agronomy project is a four-year investment by the AgriFutures™ Export Fodder Program, led by Western Australia's Department of Primary Industries and Regional Development working with BCG, Agriculture Victoria, NSW DPI, and SARDI. The project aims to understand how agronomic practices affect export oaten hay production and quality. This will help growers better manage oaten hay crops to meet export market specifications and develop a competitive advantage in our export fodder markets.

AIM

To evaluate the effect of a plant growth regulator (Moddus Evo®) on hay yield and quality to determine the role of PGRs in the export fodder industry.

PADDOCK DETAILS

Location:	Kalkee North
Crop year rainfall (Nov-Oct):	363mm
GSR (Apr-Oct):	254mm
Soil type:	Clay loam
Available nitrogen (0-100cm):	30kg N/ha
Paddock history:	Durum wheat (2018)

TRIAL DETAILS

Crop type	Oats
Treatments:	Refer to Table 1
Target plant density:	320 plants/m ²
Seeding equipment:	Knife points and splitter boot (70mm split), press wheels, 30cm row spacing
Sowing date:	6 June 2019
Replicates:	3

Table 1. Treatment outline: Oat varieties and Moddus evo® rates.

Oat variety	PGR rate (mL/ha)
Brusher	
Forester	
Koorabup	0
Mulgara	200
Williams	400
Yallara	

TRIAL INPUTS

Fertiliser:	Granulock® Z + Impact @ 60kg/ha at sowing
Seed treatment/inoculant:	Vibrance® @ 360mL/100kg and Gaucho® @ 240mL/100kg Trial managed as per best practice for herbicides, insecticides and fungicides
Plant growth regulator:	Moddus Evo®

METHOD

Two replicated field trials were sown using a complete randomised block trial design. Assessments included establishment counts, NDVI crop biomass, hay biomass at GS71, plant height, lodging, leaf greenness (SPAD chlorophyll measure), stem diameter. NIR (including DairyOne calibration) was being analysed at the time of writing.

RESULTS AND INTERPRETATION

At Kalkee in 2019, applications of Moddus Evo® reduced hay yield and height, but did not increase stem thickness (Table 2).

Table 2. Oaten hay yield, plant height and stem thickness with different PGR rates.

Variety	Hay yield (t/ha)			Plant height (cm)			Stem thickness (mm)			
	0	200	400	0	200	400	0	200	400	
Koorabup	6.6	6.1	5.1	72.3	63.1	50.8	4.6	4.0	3.7	
Brusher	7.4	6.3	6.3	71.4	52.8	52.3	4.0	5.0	4.9	
Forester	6.1	5.6	5.0	53.8	47.3	39.4	4.8	5.2	5.3	
Mulgara	8.1	6.7	6.3	82.2	61.8	50.7	5.2	5.0	4.8	
Williams	6.9	5.6	4.8	62.3	49.2	43.4	4.6	5.0	4.8	
Yallara	7.4	6.8	6.2	67.6	57.1	48.0	4.8	4.8	4.8	
	Sig. diff.									
	Variety	<0.001			<0.001			P=0.046		
	Moddus	<0.001			<0.001			NS		
	Variety x moddus	NS			P=0.004			NS		
	LSD (P=0.05)									
	Variety	0.3			4.1			0.6		
	Moddus	0.4			2.3			NS		
	Variety x moddus	NS			5.8			NS		
	CV%	9.2			5.8			16.3		

The trial was June sown, and there were no measured changes to crop maturity. The dry finish to the season restricted overall crop height and lodging did not occur.

In Western Australia, 2019 trials recorded a similar lack of response to Moddus Evo® due to the dry conditions. However, previous preliminary trials have measured a stem thickness increase and a subsequent reduction in lodging, indicating the response is seasonally dependent.

COMMERCIAL PRACTICE

It is not beneficial to apply a plant growth regulator to a hay crop in a lower rainfall season when plant height is constrained and lodging will be less of a risk.

However, applying a plant growth regulator has shown to be of benefit in more favourable seasons when lodging is more likely, with any compromises to hay yield outweighed by the reduction in lodging.

This trial will be repeated in 2020 to evaluate the agronomic practice under a different set of seasonal conditions.

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