EFFICACY OF TANK-MIX COMBINATIONS OF SETHOXYDIM AND CYHALOFOP-BUTYL ON CONTROL OF PROPANIL-RESISTANT AND SUSCEPTIBLE BIOTYPES OF *Echinochloa colonum* (L.) Link

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2005

Efficacy of tank-mix combinations of sethoxydim and cyhalofop-butyl on control of propanil-resistant and susceptible biotypes of leptochloa chinensis (l.) nees / Maziah Mohamad.

EFFICACY OF TANK-MIX COMBINATIONS OF SETHOXYDIM AND CYHALOFOP-BUTYL ON CONTROL OF PROPANIL-RESISTANT AND SUSCEPTIBLE BIOTYPES OF *Leptochloa chinensis* (L.) Nees

By

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Research Report submitted in partial fulfillment of
the requirements for the degree of
Bachelor of Science (Biological Sciences)

Department of Biological Sciences
Faculty of Science and Technology
KOLEJ UNIVERSITI SAINS DAN TEKNOLOGI MALAYSIA
2005

This project should be cited as:

Maziah, M. 2005. Efficacy of tank-mix combinations of sethoxydim and cyhalofop-butyl on control of propanil-resistant and susceptible biotypes of *Leptochloa chinensis* (L) Nees. Undergraduate thesis, Bachelor of Science in Biological Sciences, Faculty of Science and Technology, Kolej Universiti Sains dan Teknologi Malaysia, Terengganu. 58p.

KUSTEM

JABATAN SAINS BIOLOGI
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PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk: **Efficacy of tank - mix combinations of sethoxydim and cyhalofop-butyl on control of propanil resistant and susceptible biotypes of *Leptochloa chinensis* (L.) Nees** oleh **Maziah binti Mohamad** no. matrik: **UK 7640** telah diperiksa dan semua pembetulan yang disarankan telah dilakukan. Laporan ini dikemukakan kepada Jabatan Sains Biologi sebagai memenuhi sebahagian daripada keperluan memperolehi **Ijazah Sarjana Muda Sains (Sains Biologi)** Fakulti Sains dan Teknologi, Kolej Universiti Sains dan Teknologi Malaysia.

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ACKNOWLEDGEMENT

Alhamdulillah, a great thank to Allah SWT who giving me a chances to finish my final year project. A special thank goes to my supervisor, Dr. Chuah Tse Seng for the many hours of work, suggestion, tremendous patience and encouragement. He taught me how to express my idea and showed me a different ways to approach a research problem. I'm also thank my co-supervisor, Dr. Cha Thye San who has been willing to provide assistance and undying encouragement. Sincere thank also goes to all staffs of Kemubu Agricultural Development Authority (KADA), Kota Bharu, Kelantan for a lot of information to support my research. They have been consistently helpful and their efforts are appreciated.

Let me also say 'thank you' to my friends, Nuraziah Mohd Yusuf, Norzalila Abdul Rahim, Hartini Mahmud, Juliana Karso and Teh Hee Hao for their friendship, many hours of work and sweet memories. I'm also thank to my lovely family who give support, motivation, listening to my complaints and frustrations and their contribution to the overall appearance to finish this research.

Last but not least, I want to expressed thank you to all the people who involved and gave a lot of encouragement in supporting this research. Their helpful criticism and suggestion for improvement were siginificant contributions that i'm greatly appreciate. Thank you.

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LIST OF ABBREVIATIONS/SYMBOL

Mg/l	=	Milligram per liter
Ml	=	milliliter
ppm	=	Part per million
μM	=	Micrometer
$\mu Em^{-2}s^{-1}$	=	Microelectron meter per second
cm	=	Centimeter
g	=	Gram
kg	=	Kilogram
a.i/ha	=	Active ingredient per hectare

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ABSTRACT

A study on efficacy of tank-mix combinations of sethoxydim and cyhalofop-butyl on control of propanil-resistant and susceptible biotypes was conducted in the greenhouse. The seeds of *L. chinensis* (L.) Nees were collected from rice fields at Nilam Puri, Kota Bharu, Kelantan. Greenhouse experiments were conducted to screen for propanil-resistant (R) and susceptible (S) biotypes of *L. chinensis.* Dose response experiment involving seedlings at 3 to 4-leaf stage showed that the estimated ED_{50} of the S biotype was only 1/35 times compared to recommended application rate of 3.16 kg a.i/ha while the estimated ED_{50} of the R biotype was approximately 1/15 times, giving a 2.16- fold difference in resistance between the R and S biotypes. Tank mix combination experiments using the 3 to 4-leaf stage plants were then carried out in the greenhouse. Sethoxydim plus cyhalofop-butyl at 32 + 25 g a.i/ha provided better control on both the R and S biotypes of *L. chinensis* compared to that of application of either herbicide alone. Tank mixture of sethoxydim plus cyhalofop-butyl at 32 + 6.25 g a.i/ha could control both biotypes cost-effectively. Four of the nine tank mixtures were antagonism while five of them acted synergistically when applied to the R biotype. Antagonistic response was observed in seven tank mixtures in the S biotype while two tank mixtures gave additive response. Tank mixing sethoxydim with cyhalofop-butyl did not cause injury on paddy regardless of application rates.

KEBERKESANAN KOMBINASI SETHOXYDIM DAN CYHALOFOP-BUTIL UNTUK MENGAWAL BIOTIP *L. chinensis* YANG RINTAN (R) DAN RENTAN (S) TERHADAP PROPANIL.

ABSTRAK

Kajian tentang keberkesanan kombinasi sethoxydim dan cyhalofop-butil untuk mengawal biotip R dan S telah dijalankan di rumah hijau. Biji *Leptochloa chinensis* (L.) Nees dikutip dari sawah padi di Nilam Puri, Kota Bharu, Kelantan. Kajian rumah hijau dijalankan untuk menyaring biotip *L. chinensis* yang rintang (R) dan rentan (S) terhadap propanil. Eksperimen dos gerakbalas melibatkan tumbuhan pada peringkat 3-4 helai daun menunjukkan nilai jangkaan ED_{50} bagi biotip S hanya 1/35 kali berbanding dos yang disyorkan iaitu 3.16 kg a.i/ha sementara nilai jangkaan ED_{50} bagi biotip R ialah kira-kira 1/15 kali dari dos yang disyorkan dan memberikan perbezaan kerintangan sebanyak 2.16 diantara biotip R dan S. Eksperimen kombinasi yang melibatkan peringkat 3-4 helai daun juga dijalankan di rumah hijau. Kedua-dua biotip R dan S dapat dikawal dengan baik apabila sethoxydim dicampur dengan cyhalofop-butil pada kadar 32 + 25 g a.i/ha berbanding penyemburan setiap herbisid secara berasingan. Kombinasi sethoxydim dan cyhalofop-butil pada kadar 32 + 6.25 g a.i/ha dapat mengawal kedua-dua biotip R dan S secara kos efektif. Bagi biotip R, empat daripada sembilan kombinasi herbisid bertindak secara antagonistik manakala lima daripadanya memberikan gerakbalas sinergistik Terdapat tujuh kombinasi herbisid adalah antagonistik bagi biotip S manakala dua tindakan gabungan telah memberikan kesan aditif. Walau bagaimanapun, semua kombinasi bagi kedua-dua herbisid tidak mencederakan padi.