

Ethametsulfuron-methyl (SALSA™ 75WG) - a new active and the first post-emergent herbicide that controls *Brassica* and *Geranium* species in oilseed rape

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Abstract

Ethametsulfuron-methyl is an active ingredient discovered by DuPont de Nemours, which controls *Geranium*, *Brassicaceae* and other broad-leaved weeds in oilseed rape. It is to be used in post emergence, between the stage 1 to 8 leaves of the winter oilseed rape, in mixture or in programme with other herbicides.

Key words: *Brassica* weeds, ethametsulfuron-methyl, *Geranium*, herbicide, oilseed rape, weed control

Introduction

Oilseed rape (*Brassica napus*) is very important non-cereal crop. The oil extracted from the seeds of oilseed rape is used for various food and industrial applications, and the meal remaining after seed crushing is used as a protein rich component in animal feed. Weed control is necessary to achieve higher yields as weeds compete for water and nutrient with crops, causing significant yield reduction. Unfortunately, the weed spectrum which growers have to face today has changed dramatically in recent years. Difficult to control weeds such as *Sinapis arvensis*, *Geranium spp.*, *Sisymbrium officinale*, *Descurainia sophia*, *Thlaspi arvense*, *Capsella bursa-pastoris* or *Raphanus raphanistrum* have now become common-place in many parts of Europe. This is mainly due to changes in agricultural practice, such as shorter rotations, minimal cultivations, applying of herbicides in lower doses than they are registered and the lack of new active substances from other chemical groups.

The sulfonylurea herbicide ethametsulfuron-methyl named as Salsa™ 75WG inhibits the enzyme acetolactate synthase (ALS). ALS is the first enzyme of the branched-chain amino acid biosynthetic pathway responsible for the biosynthesis of valine, leucine, and isoleucine. Ethametsulfuron-methyl is a highly selective postemergent herbicide that has been shown to be an effective one for the control of *Sinapis arvensis*, *Geranium pusillum*, *Geranium molle*, *Geranium dissectum*, *Capsella bursa-pastoris*, *Descurainia sophia*, *Thlaspi arvense* and control in oilseed rape production. It also offers the activity against other broad-leaved weeds including *Matricaria chamomilla*, *Fumaria officinalis*, *Sonchus arvensis*, *Calepina irregularis*, *Anthriscus sylvestris*, *Stellaria media*.

The aim of this study was to determine efficacy of the herbicide Salsa™ 75WG applied alone, in tank mixtures and programs based on sequential treatments with Salsa™ 75WG in comparison with the standard solutions on the market.

Material and methods

The experiments were done in two seasons: 2008/2009 and 2009/2010. The fields were located at six countries in North and Central Europe- the Czech Republic, France, Germany, Poland, Hungary and the United Kingdom.

Treatments were done in two terms according to phenological development stages of oilseed rape (BBCH-scale):

1. T0: pre emergence application (BBCH 00-03);
2. T1: post emergence application (BBCH 10-14).

The experiment was to be set up using a **randomized block design** with the minimum number of 4 replicates. The tested technologies are presented in Table 1.

Table 1. The technologies tested to determine efficacy of the herbicide Salsa™ 75WG

Treatment component/ active ingredient	Dose of active ingredient / concentration of adjuvant	Timing of application
Salsa™ 75WG + Trend® 90EC	1N/ha + 0.1%?	BBCH:10-14
metazachlor	750-1250 g/ha + 0.1%	BBCH:10-14
metazachlor+quinmerac	1000-1250 g/ha	BBCH:10-14
Salsa™ 75WG + metazachlor + Trend® 90EC	1N/ha + 750-1250 g/ha	BBCH:10-14
metazachlor	750-1250 g/ha + 0.1%	BBCH:00-03
Salsa™ 75WG + Trend® 90EC	1N/ha + 0.1%	BBCH:10-14

Results

Salsa™ 75WG applied alone in growth stage BBCH: 10-14 of oilseed rape effectively controls above 16 species of weeds (Figure 1).

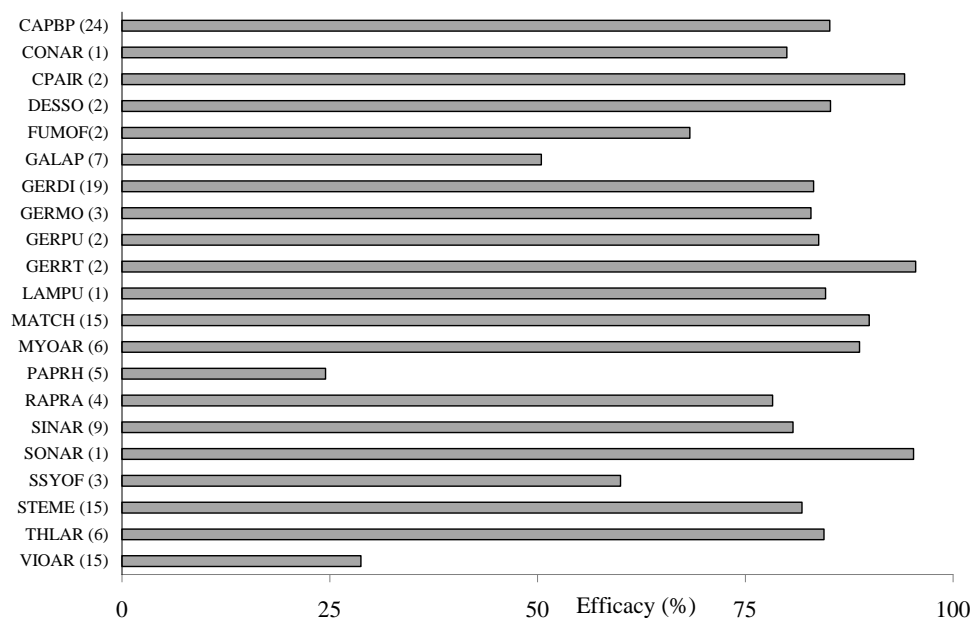


Figure 1. Efficacy (%) of Salsa™ 75WG + Trend® 90EC for weeds control; bracket- number of trials which weed were presented

More than 11 weeds sensitive to ethametsulfuron-methyl are simultaneously fairly sensitive or almost tolerant in relation to standards applied post emergence (metazachlor 750-1250 g/ha and metazachlor+quinmerac 100-1250 g/ha) (Figure 2).

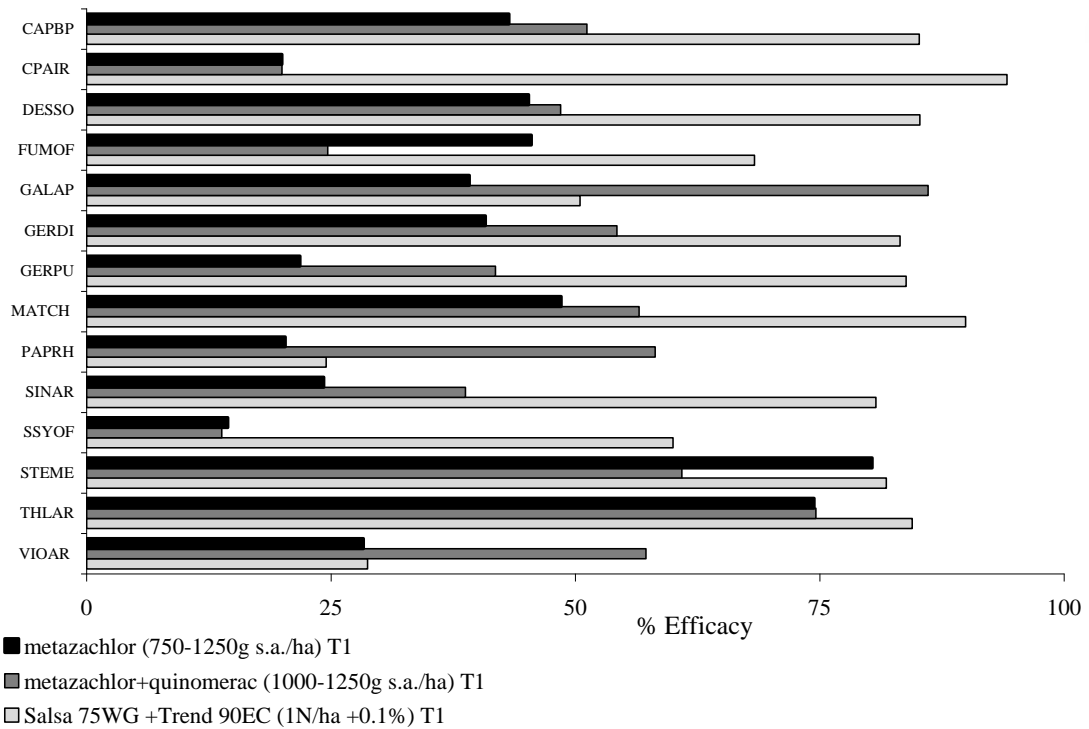


Figure 2. Comparison of the efficacy of Salsa™ 75WG with the standard solutions on the market

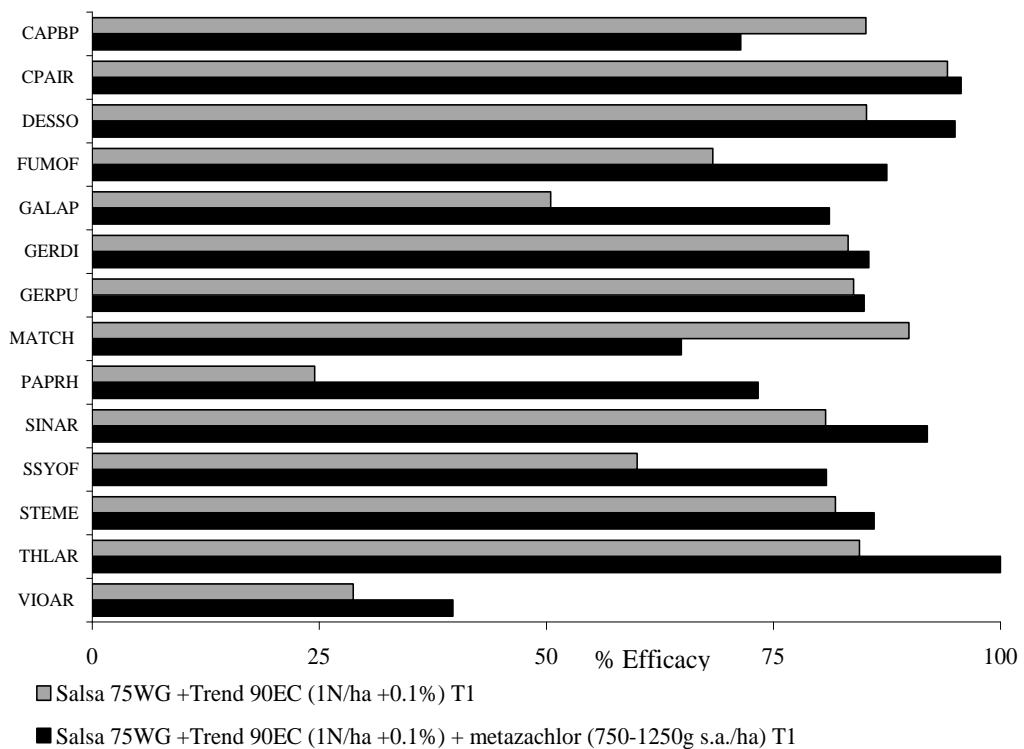


Figure 3. Comparison of the efficacy of Salsa™ 75WG with the tank mixtures Salsa™ 75WG+ metazachlor

Salsa™ 75WG supplements the spectrum of the action of metazachlor base product in tank mixtures applied in post emergence time against the following weeds: *Capsella bursa-pastoris*, *Calepina irregularis*, *Descurainia sophia*, *Fumaria officinalis*, *Galium aparine*, *Geranium dissectum*, *Geranium pusillum*, *Matricaria chamomilla*, *Papaver rhoeas*, *Sisymbrium officinale*, *Sinapis arvensis*, *Stellaria media*, *Thlaspi arvense* (Figure 3). Salsa™ 75WG can be used alone, in tank mixes or in application

sequences with partners. For more consistent control of large populations of some weeds better results were obtained in sequential application: T0- metazachlor base product, T1- Salsa™ 75WG (Figure 4).

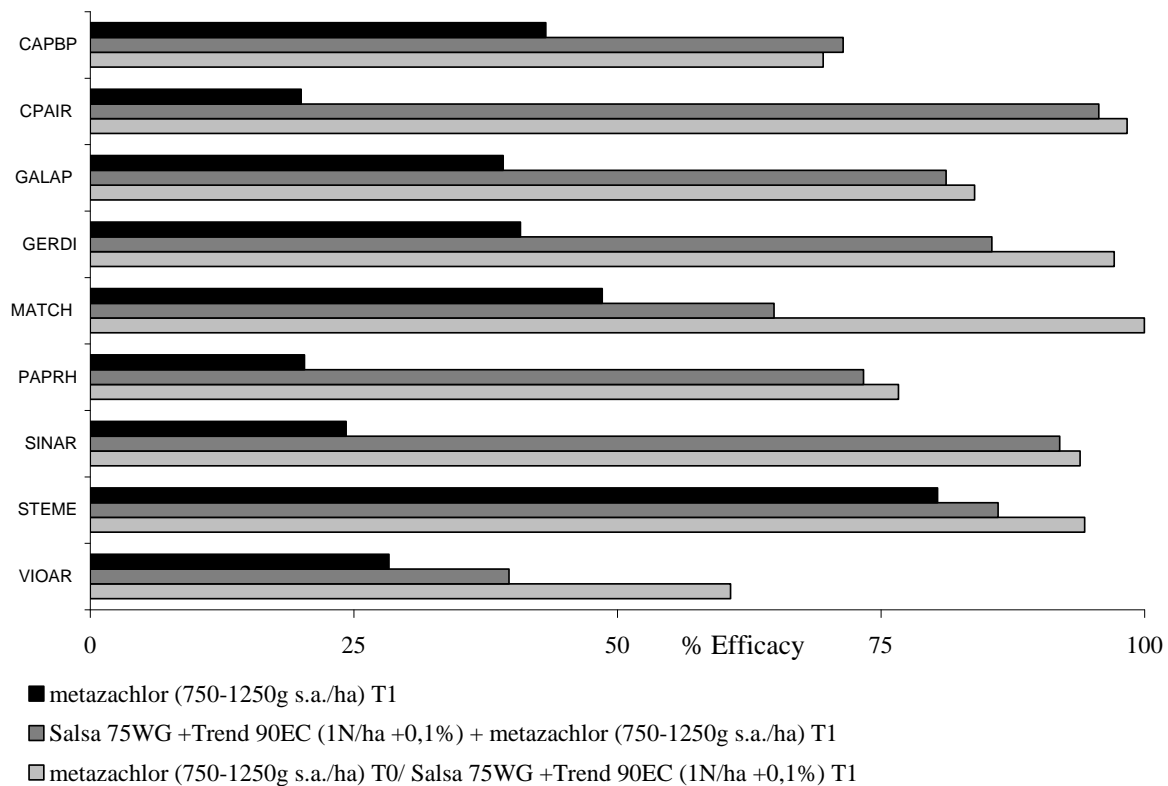


Figure 4. Comparison of the efficacy of metazachlor T1, the tank mixtures metazachlor + Salsa™ 75WG T1 with sequential treatments: metazachlor T0, Salsa™ 75WG T1

Abbreviations:

THLAR- *Thlaspi arvense* L.; STEME- *Stellaria media* (L.) Vill./Cyr.; SSSYOF- *Sisymbrium officinale*; SONAR- *Sonchus arvensis* L.; SINAR- *Sinapis arvensis* L.; RAPRA- *Raphanus raphanistrum* L.; MATCH- *Matricaria chamomilla* L., GERPU- *Geranium pusillum* L.; GERMO- *Geranium molle* L.; GERDI- *Geranium dissectum* L.; GALAP- *Galium aparine* L.; FUMOF: *Fumaria officinalis* L.; CPAIR- *Calepina irregularis* (Asso) Thell., CAPBP- *Capsella bursa-pastoris* (L.) Med., VIOAR- *Viola arvensis* Murr., PAPRH- *Papaver rhoeas* L., MYOAR- *Myosotis arvensis* (L.) Hill, DESSO- *Descurainia sophia* (L.) Webb ex Prantl

Conclusion/Application to practice

Results show that Salsa™75WG applied in a tank mix or in herbicide programs broadens the weed spectrum and provides more consistent weed control than the existing standards. Salsa™75WG gives farmers greater management flexibility to create programs for specific or difficult weeds that are currently not well controlled. Salsa™75WG post emergence allows farmers to choose the best application timing optimizing the most favorable weather conditions.