

Granite - Will You Use It or Lose It?

You have all probably heard it said that propanil has developed weed resistance almost everywhere it has been used - except here in California. Have you ever asked yourself why? Albert Fischer our weed control scientist has, and the answer may surprise you. What Dr. Fischer has discovered is that the use of propanil in California has typically been with some other grass-controlling chemical. It may be used as a clean-up material after another chemical, or you may use it as the primary material and clean-up with something else.

Dr. Fischer explains it visually with a picture similar to figure 1. Natural mutation will result in a small number of individual plants that have some degree of resistance to a chemical. If the chemical is used repeatedly and exclusively, you will successfully kill off the weeds that are susceptible while leaving the resistant ones to produce seed. It does not take long for the population of these resistant weeds to greatly expand if

the same chemical is used over and over.

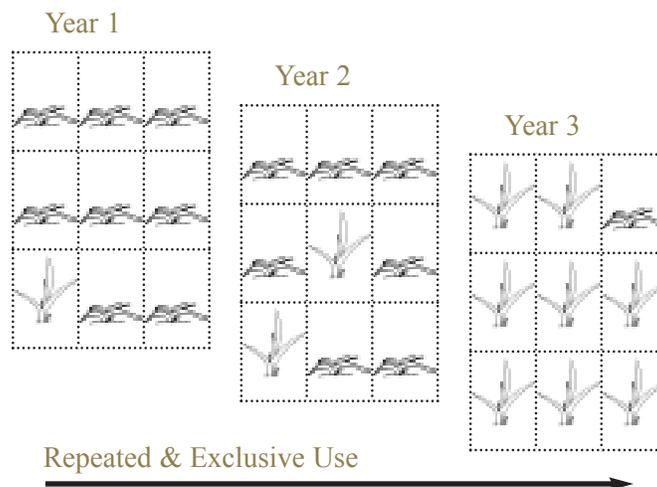
With propanil, California growers have taken a different path, even if they didn't mean to. Since propanil has been used as a sequential material or a tank mix with other grass herbicides, those plants resistant to propanil are generally eliminated by the other material. Thus, propanil continues to work well and provide a key material in your weed control program. However, all it would take would be the exclusive

use of propanil for a few seasons and resistance would rapidly arrive.

Why do I bring all this up? There is a new material, Granite, that will be available in 2005. It is an ALS inhibitor with the same mode of action as Londax. The exclusive use of this material could result in a rapid Londax-like failure in a few short years due to resistance.

This is even more important because Dr. Fischer is testing five different materials that are different configurations of ALS inhibitors. As the

Fig.1-Selecting for Resistance



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keys made by one lock company all look similar, yet only fit one specific lock; these different ALS materials each have a common **mode** of action with a slightly different **fit** at their site of action.

This leads us to the question - are there weeds that are still susceptible to ALS materials? Research on resistant smallflower umbrellasedge (*Cyperus difformis*) shows that a percentage of the population resistant to Londax is susceptible to Granite. Out of all the resistant types surveyed, 75% are susceptible and 25% are resistant. In your field you may have smallflower umbrellasedge that is susceptible, resistant, or a mix of the two. Therefore, the first recommendation with Granite is to go slow when trying it. You will need to discover what type of resistant weeds you have so you know if it will work on your land.

Secondly, look back at figure 1. The only way to keep this material long term is to be sure that

those resistant plants are eliminated. We need to learn from our propanil practices that we must follow up with another chemical (different mode of action) to cleanup those resistant individuals. Granite could be a valuable addition to the toolbox, but it will require careful use combined with other materials to retain its usefulness. Its up to you, use it well or lose it fast.

Also remember that this same practice of multiple material application should be used with Regiment and Londax.

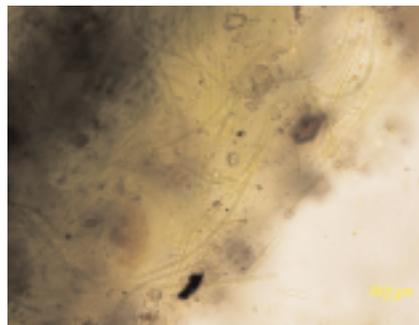
Algae

Growers have complained for a while about problems controlling algae. The RRB sought out an expert on algae at UC Davis and funded a project to find out what types of algae we have during 2004. The research sampled eight different grower fields and the results are



quite interesting. There are two basic types in the field, green and blue-green algae. Mats of the green algae appear first, transitioning to the blue-green as time goes by. The algae problem appears in all fields at the same time, driven largely by weather conditions.

Another question that comes up is on so called "black" algae. It turns out that we are selecting for this type of algae because of its tolerance for copper. Sound familiar? This is a blue-green type called



Nostoc. It is able to resist copper because the algae filaments are embedded in a thick layer of mucilage. The mucilage binds with the copper and keeps it from contacting the algae.

The RRB hopes to pursue further work in this area to find alternative control methods for this stubborn type of algae.

Other Interesting Projects

Getting information by Glenn Nader on rice straw into the hands of cattlemen is paying off. Rice straw is slowly being adopted by cattlemen for certain feeding applications. This year, in excess of 40,000 tons of straw was sold to the dairy industry. If you have any questions about putting up "hay" quality straw, contact Glenn at the Sutter County Farm Advisors office.

Larry Godfrey reports that the armyworm problem generally occurs in the last two weeks of August and the first week of September. This year it was not a big problem because the rice was early. It will be a big problem if the rice is planted late. Phermone traps will give you a two-week warning between the arrival of adults and the outbreak of worms.

Herbicide Combinations

Herbicide 1	Timing/Rate	plus	Herbicide 2	Timing/Rate
Granite	1-2 lsr (40 g ai/ac)	plus	Bolero	1-2 lsr (4.0 lb ai/ac)

Herbicide Sequentials

lsr = rice leaf stage fb = followed by ai/ac = active ingredient per acre

Herbicide 1	Timing/Rate	fb	Herbicide 2	Timing/Rate
Cerano	0.5 lsr (0.6 lb ai/ac)	fb	Granite	1-2 lsr (40 g ai/ac)
Granite	1-2 lsr (40 g ai/ac)	fb	Clincher	3-4 lsr (0.314 lb ai/ac)
Granite	1-2 lsr (40 g ai/ac)	fb	propanil	5 lsr -3 tiller (4-6 lb ai/ac)
Granite	1-2 lsr (40 g ai/ac)	fb	propanil + Clincher	5 lsr (4-6 lb ai/ac + 0.314 lb ai/ac)
Granite	1-2 lsr (40 g ai/ac)	fb	Shark	4-5 lsr (0.1 lb ai/ac)