

A refuge primer: How to do it right

INSECT Resistance Management, or IRM, should be a part of every farmer's production strategy, and the non-*Bt* refuge is one of the most important parts of that plan.

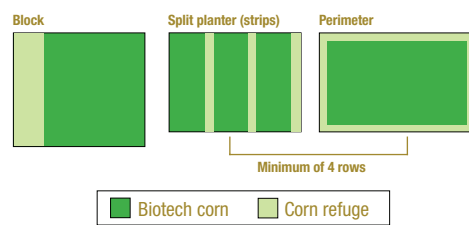
The primary purpose of the refuge is to maintain a population of corn insect pests that are not exposed to the *Bt* proteins found in both corn-borer and rootworm-resistant corn.

The lack of exposure to *Bt* proteins allows any susceptible insects to mate with any rare resistant insects that may emerge from the biotech corn. Susceptibility to *Bt* technology would be passed on to their offspring, helping preserve the long-term effectiveness of the technology.

Here are a few of the rules of refuges:

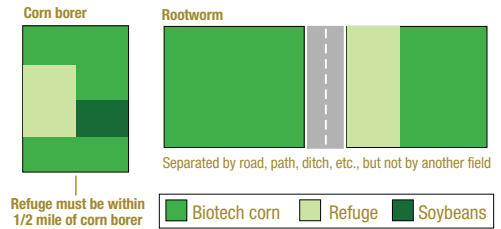
- Plant up to 80% of the corn acres with any biotech corn; plant at least

Weigh your in-field configuration options: corn borer and rootworm



SOURCE: MONSANTO CO.

Take a look at adjacent-field configurations



20% of the acres to a refuge that doesn't contain a *Bt* or rootworm trait.

- Adjacent refuge fields must be owned by or managed by the grower; you can't claim your neighbor's non-

biotech field as your refuge.

- Manage the refuge the same as the nonrefuge. Reducing inputs or putting the refuge on marginal land reduces the refuge's effectiveness.

- Do not mix nonbiotech with biotech seed for a refuge.

- For a split-planter refuge, alternate four or more rows. For a field perimeter refuge, plant at least four refuge end rows.

- You cannot use one biotechnology as a refuge for another — i.e., using YieldGard *Bt* as a refuge for your Herculex *Bt*.

- You can use a rootworm corn as a refuge for a *Bt* corn, and vice versa.

- *Bt* corn only: Plant the refuge within a half mile of, and at the same time as, biotech corn.

- *Rootworm* corn only: Plant the refuge within or adjacent to rootworm corn. They can be separated by a ditch or road, but not by another field.

- *Rootworm* corn only: If the refuge is on rotated ground, then the rootworm or stacked-trait corn must be on rotated ground.

- *Rootworm* corn only: If the refuge is in continuous corn, then the rootworm or stacked-trait corn can be on either continuous or rotated ground.

- *Bt* and rootworm: Plant the refuge at the same time as biotech corn.

- Consult your dealer if you're confused in any way. "Take time now to plan it out," says Pioneer's Lance Bailey. "It's easier to do now, sitting around the kitchen table, than it is in April when the planters are rolling."

Don't have a plan for 2007's refuge?

ACROSS the board, experts have harsh words for farmers who may not have a corn refuge planned for 2007. University of Illinois entomologist and IRM expert Mike Gray offers this advice to those farmers:

"I think you're making a mistake. In the long run, it will basically create a situation that will shorten the lifespan of this very useful technology. And that's unfortunate.

"If this one goes by the wayside, if resistance does develop, when you think of crop rotation not working and of fewer soil insecticides in the marketplace, what tools will producers have to utilize against corn rootworms?"

"The short-sighted notion that 'they'll come up with something new' is just that: very short-sighted."

From Across the Prairie

Here's a look at how a handful of Illinois farmers will handle their biotech corn refuges this year.

Name: Jamie Walter, DeKalb

Percentage of farm planted with technology corn: 100% Roundup Ready and 80% DeKalb triple-stacked; 20% will be straight Roundup Ready.

Refuge plan: "For the most part, we'll use a split-planter refuge. On a few farms, we may use an adjoining block refuge. We also intend to use a preemerge herbicide on nearly all our Roundup corn acres [though it's not required]. Fighting glyphosate resistance is a stewardship issue we think all producers should take seriously."

Checked? "No, but as a seed dealer I know that some customers have been."

Parting thoughts: "Being good stewards of the land and of technology is in all of our best interests. However, managing all the puzzle pieces can cause a real headache and poses real logistical problems at times. Nonetheless, the rules are in place for a reason, and it's up to all of us to do our part."



Name: Rich Guebert, Ellis Grove

Percentage of farm planted with technology corn: 65% *Bt*

Refuge plan: "We'll picture-frame it on smaller fields and hill ground — odd-shaped fields. In the bottom fields, we plant strips, with two rows of regular corn in the boxes. All the corn has Poncho 250 on it. Then we scout. We don't have a rootworm problem down here yet. We just have it for the cutworms, corn borers. We haven't sprayed an acre of corn with insecticide for four years now."

Checked? "No. I haven't heard of anyone in our area being checked, but we're not really in the Corn Belt, you might say — at least not as in other parts of the state."

Parting thoughts: "It's just important that everybody follows the guidelines and are good stewards. You can't count on your neighbor to plant the refuge acres."

Name: Chad Leman, Eureka

Percentage of farm planted with technology corn: 100% Roundup Ready or Liberty Link; 75% as some combination of *Bt*, rootworm or stacked traits; 25% will be conventional corn.

Refuge plan: "I'll either plant strips or I'll just block it off. I keep insecticide in all the boxes and turn on and off what I need to."

Checked? "No, and I've never heard of anyone else who has."

Parting thoughts: "For the most part, I think farmers do a pretty good job of keeping track of all that stuff. One thing that's getting easier is that more guys are going to the same herbicide. Chemical sales have gotten pretty simple, and seed sales have gotten more complicated. It's flip-flopped from where it was a few years ago. Now the money's going into developing traits and not as much into chemical research."



Name: Rolli Moore, Roseville

Percentage of farm planted with technology corn: 75% traired varieties. Of that, half will be YieldGard Plus (*Bt* and rootworm), 25% will be rootworm and 25% will be *Bt*.

Refuge plan: "I use block configuration of the refuge areas. I do have some fields that border each other, so the refuge requirement for both could be planted in one; but most of the time each field has its own refuge area. I apply granular insecticide on the refuge corn at planting."

Checked? "I have not been checked for compliance by anyone."

Parting thoughts: "It's important that we all play by the rules on refuge requirements."