



WHY SHOULD FARMERS BE CONCERNED ABOUT OPEN FIELD GENETICALLY ENGINEERED (GE) DIAMONDBACK MOTH TRIALS IN GENEVA NY?

How will GE Diamondback Moth Trials impact brassica production in New York State?

The New York State Agricultural Experiment Station in Geneva, Research Farm North will be the location of 6 trial sites (3 release sites and 3 control) – up to 10 acres per site (60 acres total) for testing of a new technology – **Genetically Engineered Diamondback Moth (GDM)**. This research has been granted a USDA/APHIS permit. How could the trials affect New York State brassica production?

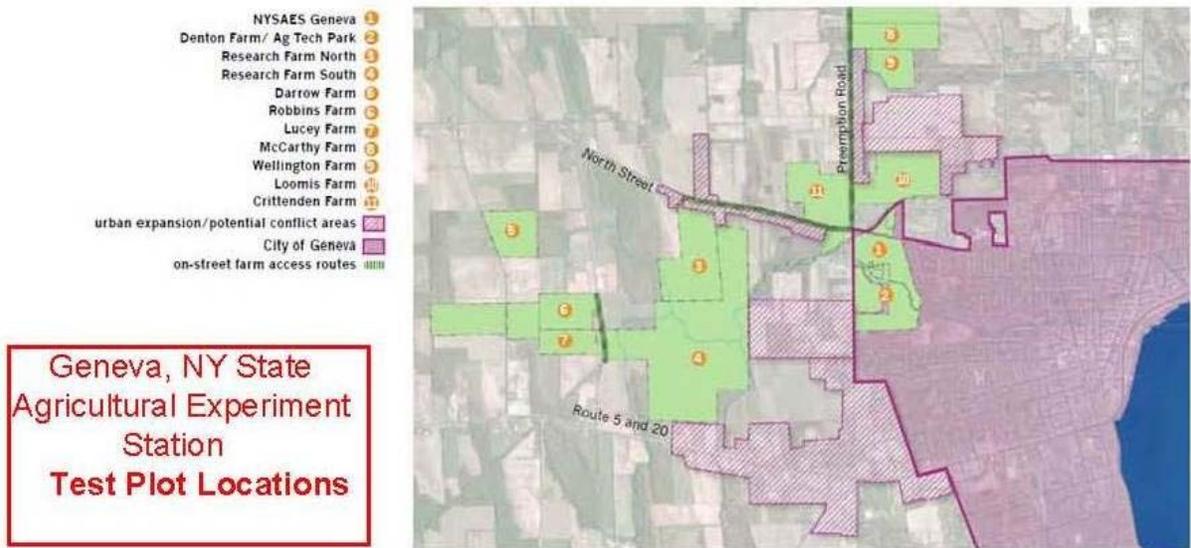
NOFA-NY is specifically concerned about the effect of this proposed research trial on brassica production (both conventional and organic) in New York for agronomic reasons. Putting aside the viability of commercialization of this technology, NOFA has questions and concerns about the trial itself and its effect on NY farmers. Open field trials are scheduled to begin in summer 2016.

- Up to 100,000 GE Diamondback moths (all male) will be released per week in the open air during the brassica crop cycle (3 to 4 months each year) – Up to 1.44 million male GE moths/year (for 3 years), will be released at these sites which will be planted in brassicas (e.g. broccoli or cabbage). Large numbers (from 10X to 40X natural populations) are needed to be released to overwhelm the natural population¹
- **How does it work?**
 - GE moths (male) will mate with non-GE female moths. The females will lay eggs on the plants, and most of the female larvae will die² on the plant; the males will pupate and go on to continue mating with non-GE moths until the population is suppressed
 - The ‘Late acting *conditional* lethality trait’ trials include releases of millions of GE males intended to suppress wild pest population. GE Diamondback Moths are “female-killing” only – they are not sterile.
- **What Will Happen Off the Trial Site?** If farmers have cabbage and other brassica fields near the Geneva test plots, will their brassicas be affected by insect releases at the Experiment station? Will there be a need to spray more than usual to control Diamondback moth? Is there a greater risk of contamination of crops by larvae?
 - “Late-acting lethality” means there is a high risk of crop damage *and* contamination with the potential for dead GE larvae remaining on the crop.
 - How far off the trial site will such large releases travel during the trials? This is unknown, since The permit addresses only the possibility of overwintering.

¹ The USDA APHIS permit also allows the release of non-GE moths (a non-native strain), if there is not enough of the natural population to perform the trial. It is unclear whether the natural population is sufficient – Diamondback moth is not necessarily a significant pest to many upstate NY brassica growers.

² Conditional lethality of GE moths is not 100% (approx 1% female survival)

- Potential Loss of Markets: Will consumers be willing to purchase NY cabbage and other brassicas if they believe it may be contaminated with GE larvae?
 - Is there a risk of consumer backlash from publicity about the trials?
- Are the GE larvae safe to eat? There has been virtually no safety testing for consumption by humans or animals, including wildlife
- **Survival and Resistance**
 - In general, 1% of the female moths are expected to survive. Is there a chance that those that survive will eventually build resistance to the 'female lethality trait'?
 - *Can more survive?* This technology uses a "tetracycline switch" to turn off/on the 'female lethality trait'. If there is tetracycline in the environment³, it may turn the switch, and significantly more may survive⁴.
 - Will resistance to the killing trait evolve over time?
 - Will antibiotic resistance spread?
- **Other Implications For Farmers**
 - Tackling only a single pest reduces competition and can lead to explosions in other types of pests. Other brassica pests include: imported cabbageworm, cabbage looper and thrips, root maggots, flea beetles, possibly Swedish midge
 - Spraying (with Bt or conventional pesticides) may affect the GE releases: but stopping spraying may worsen problems with other pests.



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³ Possible sources of tetracycline in the environment: Tetracycline has been used to manage fire blight in apple trees to combat Fire Blight; tetracycline routinely used in animal production is known to persist in manure from these animals, often used in direct manure applications or compost applications for fertility.

⁴ In similar tests of GE mosquitoes, tetracycline in the environment caused 18% survival rate