1. **Project Name**
   Use of Corn Gluten Meal to Reduce Weeds in Beet Fields
   FNE02-402
   David Barylski
   12120 Triadelphia Rd.
   Ellicott City, MD 21042
   410-531-5065
   Dabarylski@aol.com

2. **Goals**
   Determine if corn gluten meal (CGM) can be used effectively as an organic herbicide in growing beets.

3. **Farm Profile**
   A very small vegetable operation (less than two acres), primarily devoted to raising perennial flowers and woody ornamentals. I had had some success in previous years growing specialty beets for an upscale restaurant.

4. **Participants**
   I consulted with Nick Christians, Iowa State University, and Caragh Fitzgerald, Howard County, Maryland Co-operative Extension Agent, prior to conducting the experiment. Fertrell of Lancaster, Pennsylvania was kind enough to supply the corn gluten meal for the experiment.

5. **Project Description**
   I set up elaborate procedures to monitor and analyze whether the use of corn gluten meal would reduce the occurrence of weeds in my beet beds. I intended to study the amount of time spent weeding, the type of weeds, their frequency, and the effect of using corn gluten on crop yields. Unfortunately, I captured only a small percentage of the data I had intended.

   Essentially, in 2002, I planted eight sections of Chioggi beets 20 feet long, each with 4 rows. Corn gluten meal was applied, both as a nitrogen source and as an intended herbicide, to 5 sections, at various times (at planting and when seedlings were up). No corn gluten meal was applied to the remaining three sections. Blood meal was applied to these three sections as a nitrogen source. Supplemental boron was applied at the same rate to all eight sections. No herbicide was used in these three sections.

Some rows of both the corn gluten meal and the non-corn gluten meal sections were not weeded at all, some at 20 days, and some at both 20 and 40 days. An attempt was made to analyze the amount of time spent weeding. The results were inconclusive (they are provided below).

Because of the lack of results in 2002, I intended to try again in 2003 and 2004. However, in 2003, due to a lack of rain, the soil was so dry and hard, it was impossible to plant. In 2004, it didn't stop raining until late June, and the soil was also impossible to work.

In 2005, I tried again. This time I simplified the experiment. One 40-foot section was planted with 3 pounds of corn gluten meal applied at planting, and 3 pounds applied 20 days later; one 40-foot section was planted with 3 pounds of blood meal applied at planting, and 3 pounds of corn gluten meal applied 20 days later, and one section was planted with 3 pounds of blood meal applied at planting, and 3 pounds applied 20 days later.

Supplemental boron was applied to each section. All sections were weeded equally and no attempt was made to determine the amount of time spent weeding as had been done in 2002. All sections had 4 rows.

6. Results and Accomplishments

I had very little success in determining the amount of time weeding the corn gluten meal versus non-corn gluten meal sections in 2002. Although some data were collected, they were inconclusive. It appeared there was very little difference in the number of weeds or the amount of time spent weeding between the corn gluten meal sections and the non-corn gluten meal sections. In addition, the amount of beets actually produced was less in the corn gluten meal sections than in the non-corn gluten meal sections (1.89 ounces per linear foot, as compared to 2.53 ounces per linear foot for the non-corn gluten meal sections – neither are anything to brag about.)

In part due to the lack of yield in 2002, and the inability to collect meaningful statistical data, I concentrated in 2005 on observing and describing, if only anecdotally, the general effects of the corn gluten and the types of annual weeds that did or did not occur, rather than crop yield.

Basically, I saw no difference in the frequency of weeds. All sections had an ample amount of crabgrass and barnyardgrass. In fact, there appeared to be more carpetweed in the corn gluten meal treated sections than in the

non-corn gluten meal treated sections. All sections also had an ample supply of perennial weeds such as Canadian thistle, clover and knotweed. Surprisingly, hairy galinzoga, which had been my main nemesis in prior beet beds, was conspicuously absent. However, this validates that hairy galinzoga is more prevalent in continuously worked, more fertile beds as the beds used in 2002 and 2005 were being used for the first time.

7. Site Conditions
   I had the soil extensively tested before conducting this experiment. The pH was in an appropriate range for beet production (6.1 - 6.4), and all other indexes seemed at satisfactory levels. However, upon further review, I noticed that the phosphorus level was "medium". Since beets are a root crop, there may have been a need to provide addition phosphorus. Were I to do this over again, I would insure a higher level of phosphorus. In addition, the beds used in previous, more successful years had an organic material content of 7.5% as compared with 5.2% for the pilot beds.

8. Economic Findings
   No economic findings could be reached. The yields were so abysmally low in the year I captured them (2002) that no recommendation could be made for using corn gluten meal as an herbicide.

9. New Ideas
   Were I to do this again I would change two things. One, I would insure that phosphorus levels were, at a minimum, an optimum level. Secondly, I would concentrate on analyzing whether corn gluten meal applied after beet seedlings were already up was useful. My observations indicate that the corn gluten meal, paradoxically, although doing little to prevent weeds, might have reduced beet seed germination.

10. Future Plans
    I have no plans at this point to continue this practice – it just does not seem economically practicable. Corn gluten meal as an herbicide may possibly be useful for bush crops like tomatoes or peppers, but I don't see it as useful for crops like beets, lettuce, etc.

11. Regrettably, I did not participate in any outreach efforts.

12. David Barylski, February 16, 2006