

Is fluid seeding for you?

HERSHEY — Fluid seeding is a relatively new technique whereby seed is mixed in a gel carrier and pumped through a planter into a furrow in the soil, reports Donald R. Daum, Extension Agricultural Engineer, Penn State.

J.G. Elliott, from the Weed Research Organization near Oxford, England, is given credit for originating the concept in 1963. Research was started at the National Vegetable Research Station in England during the early 1970's. Since then research has been conducted in Canada as well as the United States.

The gel and equipment is now commercially available and is in limited use.

Fluid seeding of pre-germinated seeds (known as chitted seeds in England) involves several steps: seed germination in controlled optimum environmental conditions, mixing selected germinated seeds with a gel media to

protect and suspend the seeds for distribution, sowing the seeds and gel with a specialized fluid seeder

"Nearly all experience in fluid seeding to date is with vegetables because the research was done by people working with vegetables and the greatest advantages appear to be with vegetables," says Daum.

Some of the advantages of fluid seeding include:

—Quicker seedling emergence - four days after planting pregerminated tomato, lettuce, cucumber, cabbage, and okra seeds in 75°F soil, over 90 percent of the plants were up compared to 30 percent for lettuce, 5 percent for cabbage, and no emergence for the other dry sown seeds;

—Uniform emergence - pregerminating overcomes the problem of germinating seed in soil, especially in cool temperatures. Also, pregerminated

seeds can be separated from nongerminating seeds prior to planting, so only viable seeds are planted;

—Earlier harvest - the quick emergence leads to faster development and maturity. However, the time interval decreases considerably from emergence to harvest,

—Increased yield - many crops show an increased yield over dry sown seeds. Tomatoes produced 15.7 tons/acre compared to 9.6 tons/acre for conventional seeding; the transplanted crop yielded 18 tons/acre. Carrots showed an 18 percent increase and onions produced 10 percent more weight. Most of these increases are due to improved stands,

—Cheaper and quicker transplants - by sowing pregerminated seeds the transplants can be grown at lower temperature, saving energy; in some cases plants can be grown outside in plastic tun-

nels; and

—Additives can be used - presently, research is active in this area, possibilities include pesticides, growth regulations, nutrients, and soil amendments.

Disadvantages are:
—Frost damage - the seedlings may emerge so quickly that frost may damage them with early planting;

—Seeds killed - if too much gel is used, seeds may die before they emerge from the gel from lack of oxygen;

—Gel mixing problems - high pH or hard water causes problems in mixing the powder and liquid to form the gel. Distilled water required in some cases;

—Seed committed to grow - once seed is imbibed (soaked) or pregerminated it is committed to growing. Such seed can be held up to two weeks by keeping it moist and cool (40°F.) However, once the seed is mixed in the gel it can be held only 3 to 4 days without major loss of viability;

—Germination time and equipment - time to pregerminate the seed varies from 24 hours to three days for tomatoes to seven days for celery. The seed must be held at the temperature appropriate for the species and rinsed every 12 hours to remove a naturally produced growth inhibitor; and

—Requires specialized planting equipment - the planter must have a pump that will deliver the desired quantity of the gel-seed mix without damaging the radicles (roots). A special dispenser is necessary for single seed planting. Fluid seeders are commercially

available and are in use in Ohio and California. These planters are manufactured in Canada and England.

For field operation, the planting units are tool-bar mounted with attachments available to plant through plastic mulch and to place anti-crustant material over the seed. Lightweight push units are available for the home gardener or hobby farmer. Fluid seeders are also available for planting single seeds into soilless blocks for growing transplants.

"More field research is needed to determine feasibility under Pennsylvania conditions," concedes Daum. "The technique shows real promise for hard to establish crops, earlier and more uniform emergence, and increased yields. We should at least experiment with fluid seeding. It may be a golden egg for vegetable growers."

Bread Baking

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flour and knead until smooth. Place in greased bowl to double in bulk.

Punch down doughs and divide in half. Shape each portion into 15-inch rope. For each braid, place a rope of whole wheat, rye, and white on a greased cookie sheet braid loosely and pinch ends to seal. Cover lightly and let rise 1 hour or until doubled in bulk.

Brush loaves with egg yolk wash (1 egg yolk beaten with 1 tbs water). Bake at 350° for 35 minutes or until well browned. Transfer to 2 racks to cool.

Braided Pan Loaves - Prepare as directed but divide each dough into 4 pieces. Roll into 11-inch ropes. Braid loosely 3 ropes and pinch ends to seal. Place dough into greased 4½ x 8½ inch loaf pan. Cover and let rise to double. Brush with egg yolk. Bake 350° for 25-30 minutes. Put on rack to cool.

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