

Hypothesis: Crops affect the productivity of the species planted around them.

#### Study Design:

Storage seed crops will be grown in a 6x22m (7.7x20m) plot in the Pearl Creek Elementary school garden. Hensel's 1st-grade class will plant in ½-meter columns and rows with a rotary seeder (Earthway). This will create 528 ½-meter square study plots. Crops intentionally planted will be buckwheat, sunflower, oats, quinoa, dill, pea, forget-me-not, clover, flax, marigold, nasturtium, and daikon. In addition to the area planted with the seeder, students will broadcast an area with seeds in the same proportions.

Planting and harvest dates will be determined by the school calendar and weather. Planting will occur during the final week of school (May 12-16). Harvesting will occur in the fall- ideally after a killing frost and several days of dry weather (the 2024 season was 5/21-9/30. 30th).

The area will be measured, marked, and amended before planting. Planting will primarily occur in an area that was used for last year's pilot. However, the 2024 area is not a rectangle. Soil that was previously planted in will be loosened with a broadfork. New areas that will be brought into cultivation will have the turf inverted with a spade and broadfork. Alaska fishmeal will be sprinkled across the planting area and raked in by students and volunteers. Stakes will be driven around the perimeter of the rectangle in ½ meter increments and labeled.

For the area planted with the seeder: string will be run across the plot to guide the seeder. The seeder will be loaded with one variety of seed at a time and the matching planting plate. The teacher will operate the seeder with one student at a time. After the area is planted strings will be reattached across the area.

Strings will also outline the broadcast area. All varieties of seed will be measured and mixed into a wheel barrow. A significant amount of inert material with a color that contrasts the soil will also be mixed in the wheel barrow (clay, sand, and/or flour). Students will throw and sprinkle handfuls of this mix across the broadcast area. Students, staff, and volunteers will rake the broadcast seed into the planting area.

If conditions are dry, seeds may be watered in after planting (or soaked before planting). The rest of the season the area will be 'dry farmed'- only receiving water from natural precipitation.

During the growing season the area will not be weeded. Mowing will be performed biweekly around the site.

In the fall, students and volunteers will take a fieldtrip to the Pearl Creek School site. Students will use scissors to cut stalks from the broadcast area and bring them to picnic tables dedicated to each species. Volunteers will bundle seeds into sheaves.

In the area planted with the seeder, each ½-meter square will be cut and bundled into a sheaf and labeled.

Sheaves will be hung to dry in Hensel's classroom to dry. Seed will be threshed, winnowed, and weighed over the following months.

Secondary Questions: Will saved seed outperform seed previously grown in other locations?  
Will seed that came from the broadcast plot be better adapted to that planting method?

I turned over a portion of grass in the broadcast area with a broadfork. Students loosened the rest of the plot with broadforks. The class soaked the seed for the broadcast in aloe. Damp seed was rolled in clay and then mixed with potting soil. Seed was broadcast by students on May 14th, 2025. The area was raked and students danced across the field.

The spring was initially cool and then switched to hot and dry. Very low germination rates were observed in the broadcast area on June 14, and July 1st. The broadcast site is almost entirely covered in lambsquarters. Is this due to shattering during the fall harvest and/or soaking problems? One visible flax and oat were flowering - significantly ahead of the crops in the rotary plot. Are the early flowering individuals from increased weed pressure or were they 'fall planted' during the harvest.

The row site was turned over with a small rototiller. I planted with a rotary seeder over the course of several days. I did not clean out the seeder between varieties, but I worked towards successively larger seed plates. Initially it was starting to rain when I tried using the seeder. Moisture hindered the seeding process. May 18th 'seven rows on carrot', 'one radish, two dill', 'two flax'. May 20th 'finished oat horizontally, 4 oat vertically and a jam', '4 sunflower', 'Horizontal remainder buckwheat and 7 diagonal', 'About 4 pea', 'One nasturtiums and marigold'. I started watering in on May 20th and finished watering in both plots on the 21st.

On July 1st the rotary seeded area was looking more productive. The lines where oats and buckwheat had been sown were clearly visible.