At a 40-inch row spacing, there is little difference between EW and NS row directions on the average daily transmission. The main difference is in the hourly distribution. However, row direction may cause greater differences at a wider row spacing. Unfortunately, widely spaced EW rows were not included in the experiment.

Check-planting increases light transmission appreciably. With a given hill spacing and population, check-planting is the most open planting method.

Both check-planted and EW drilled corn provide more uniform light at the soil than NS planting. They both provide relatively higher transmission in the morning and afternoon hours when there is less incident light than at noon. The authors have no knowledge as to the importance of the time-distribution of the light to interseeded alfalfa. However, if it is of importance, the high light penetration provided by wide NS rows during the 1000 to 1500 period when radiation is large may produce appreciably different effects than the penetration on either a check or an EW drill planting.

There is only a small difference between dwarf (brachytic) and normal 112-day relative maturity corn varieties planted in 40-inch north-south rows, at 16 kiloplants per acre. The light penetration in the dwarf corn was 92% of that in the normal corn. The main difference was in the early morning and late afternoon at low sun angle when the radiation is low—the dwarf corn transmits substantially less light at this time. This result could be expected since the dwarf and normal plants averaged the same number of leaves per plant and there was no noticeable difference in leaf size. The vertical spacing of the leaves should have little effect except at low sun angle.

The transmission measurements and other radiation measurements show that the light transmission in the 40-inch spacings was affected by cloudiness. When the sky is cloudy, there is about a 25% increase in the fraction transmitted except on the EW drilled corn. The fraction transmitted through EW drilled corn and widely spaced NS drilled corn is not significantly affected by cloudiness.

The above results were obtained during a dry year when corn growth was retarded by moisture deficiency. Measurements made during 1957, a good corn year (the yield was 65 bushels/acre in 1958 and over 100 bushels/acre in 1957) indicated that the light transmission through more vigorous corn in a 40-inch row would be about 75% of the values quoted herein. We had no data permitting a comparison at wider spacings. —C. B. Tanner and A. E. Peterson, Professor and Associate Professor of Soils, University of Wisconsin.

"DEAD SEED" METHOD OF SPACE PLANTING OAT AND BARLEY SEED

HEREDITARY and environmental variation in size of oat and barley seed usually prevents satisfactory mechanical space planting. Space planting large populations by hand usually is prohibited by cost. A satisfactory mechanical method would facilitate most plant breeding programs.

The success of the "dead seed" method of space planting seed presented here depends on four major steps or operations: (1) reducing the germination of the added seed to zero; (2) ratio of live and "dead" seed; (3) uniform mixing of live and "dead" seed; and (4) proper seeding rate.

Step 1. Secure commercial-quality average-size clean seed of the crop (oats or barley) to be planted. Approximately three times the amount of seed to be space planted is needed. Reduce the germination to zero (referred to as "dead" seed). This may be accomplished by the use of a pressure cooker. Fill the cooker about two-thirds full of seed and add sufficient water to cover the seed. Heat the cooker at 10 pounds pressure for 15 minutes. Spread the seed in trays, drain off any excess water, and place in an oven for drying. Test each lot of "dead" seed for germination before using.

Step 2. Determine the desired spacing, the average weight per 100 live seed, the weight of 100 "dead" seed, and the desired rate of sowing for all of the seed. Mix the live and dead seed in proportions to secure the proper spacing of the live seed and rate for all of the seed. Assume that a grain drill with rows 7 inches apart, calibrated to a sowing rate of 1 bushel per acre, plants 12 seed per foot of row. If the live seed are to be spaced 4 inches apart, they should be mixed with dead seed of equal size in a ratio of 1:3. Small lots of seed may be prepared for planting with other types of equipment.

Step 3. It is necessary that the live and dead seed be uniformly mixed. This may be accomplished by the use of a soil blender or similar mixer. One pound or less of live seed should be mixed with a proportionate amount of dead seed at a time to assure a uniform mixture.

Step 4. The sowing rate of the uniformly mixed live and dead seed determines the spacing of the plants from the live seed. The mixing of the seed is usually based on a weight basis. However, the actual spacing of the plants depends upon the number of live seed sown per foot of row. The rate of sowing used must be based on the number of live seed per given length of row if the method is to accomplish the desired goal. —R. L. Thurman, Associate Agronomist.

A SOIL SAMPLE PULVERIZER

IN THE preparation of soil samples for the determination of pH and the extraction of the readily available plant nutrients, such as phosphorus, potassium, calcium, and others, the soil is usually pulverized until most of it will pass a 20-mesh or similar sieve. In doing this, only the aggregates or granules, usually varying in size from that of a pinhead to that of peas, and each consisting of hundreds and even thousands of individual mineral particles or crystals, are broken down (deaggregated). These aggregates are held together by the extremely fine particles of clay and organic matter which act as a glue or cementing material.

It is highly important that the pulverizing process be regulated so that only the aggregates are broken down, and the individual mineral grains or crystals are not ground down to a flour-like material so as to expose new surfaces. In some cases the nutrient elements in these new surfaces would have a greater solubility in the extracting solution used than in the weathered surfaces of the original soil particles. Even if the solubility should be the same, the resulting increased surface could increase the amount dissolved. Thus, the soil test for available plant nutrients could...