Yield and quality of the potato crop is directly influenced by disease content of the seed that is planted. Potatoes are subject to a long list of virus, bacterial and fungous diseases, many of which are not readily recognized by the appearance of the tubers. Many diseased potato plants may be identified by their appearance as they grow in the field but the infection does not show on the tuber. Blue tag certified seed is the highest commercial quality because it contains a minimum of disease-carrying tubers. Many growers, however, do not realize the value of certified seed and therefore use the cheaper table stock or even lower grades for seed. Growers of certified potatoes and others who maintain their own supply of good seed rogue out such diseased plants and in that way produce seed that prevents serious disease loss.

But the many growers using ordinary stock are likely to have a high percentage of diseased and low yielding plants and thus harvest a poor crop. To aid in providing better seed, a simple floating process which segregates the best seed potatoes out of common stock infected with virus disease has been worked out on the Klamath experimental area of the Oregon Experiment Station. In a test of a lot of ordinary commercial Netted Gem seed potatoes (Table I) such as many farmers plant, the removal of the light weight potatoes, amounting to 64.3 percent of the tubers, eliminated approximately 92 percent of the virus diseases in the field. In this experiment the entire lot was put into the solution at a strength of 1.09, 91.5 percent floated, leaving 8.5 percent. The solution was then diluted to a strength of 1.08, and the tubers floated out at the 1.09 strength were put in. 64.3 percent floated, leaving 27.2 percent in the solution. This was continued and each lot remaining in each solution was planted separately.
While this method is not known to remove the virus disease, leafroll, it does float out a large percentage of the mild, mosaic, rugose mosaic, velvet leaf, and other yield-reducing diseases.

The percentage of tubers that should be floated off depends upon the amount of virus and other diseases in the lot. In a very bad lot of potatoes, it is desirable to remove a substantially higher percentage than indicated above. On the other hand, in a lot having a smaller amount of disease, the removal of a smaller percentage should be satisfactory. The disease content of certified potatoes is so low that floating them does not pay.

Potatoes sink to the bottom when placed in pure water. In a solution of salt water the least diseased or heaviest potatoes sink while the lighter or disease-infested ones float. It is possible to remove these lighter potatoes by floating the entire lot in a salt solution adjusted to the proper strength or density. A solution of salt water with a specific gravity of approximately 1.08 is a satisfactory strength for floating out the light or diseased potatoes of the average lot of the Netted Gem variety grown in the Klamath area. This strength will float out about 20 to 30 percent of the lighter tubers. Different strengths of solution may be required for other varieties and in other localities.
To make a solution of approximately 1.08 specific gravity requires about one pound of common stock salt to one gallon of water. The strength does not vary measurably in the course of a day or two of use. The solution should be adjusted with more salt if it is desired to float off more potatoes, or more water if less floating is desired. For practical purposes, actual specific gravity may be disregarded and the density of the solution adjusted to remove the desired percentage of potatoes. Table I shows the advantages of planting the heavier seed, both in total yield obtained and in the higher percentage of marketable potatoes. There may be 15 to 20 percent more tubers produced by the heavy than by the light portions of the lot. The yield difference amounted to 35 to 40 bushels an acre.

In using this flotation process, it should be remembered that numerous factors such as soil fertility, previous crop grown, frequency and amount of irrigation, temperature, and variety will influence the average specific gravity of a given lot of seed. Thus, no two farmers are likely to float out the same percentage of their potatoes with the same strength of solution. Those who know their stock to be quite badly diseased should make the solution strong enough to float out more of the tubers than others who have stock known to be relatively good.

Care should be taken to wash the salt from all the tubers, both light and heavy ones, after floating. The presence of a small amount of salt may kill sprouts and cause the tubers to decompose rapidly. No damage to tubers has been experienced, as they were promptly and thoroughly rinsed. Sprouts will be burned back, much as when subjected to the numerous potato dips.

Light-weight tubers floated out need not be wasted because when washed after floating they are as salable for table use as before. While this portion is not so mealy as the heavier tubers, the market makes no discrimination.

If large quantities of seed are to be floated, a large vat or trough is advantageous. For small volumes, however, a half of a 50-gallon barrel is very satisfactory. Too many potatoes should not be emptied into the solution at one time as each tuber must be free to settle or rise according to its weight in relation to the density of the solution. Separation takes place rapidly, permitting rapid handling of the seed.

This simple process, reported from Canada a few years ago, has been found entirely practical in Klamath county and can do much toward eliminating lower yielding seed.