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BETTER POTATO STANDS

by

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Good potato stands are an important factor in high yield and quality. In a special survey of 683 Eastern Idaho farms only 15.7% of the fields (Table 1) had good stands. A good stand should contain over 90 plants per hundred feet of row.

Yield reduction is not the only loss encountered. The per-acre costs of production are nearly as great for fields with poor stands as those with good stands. This means there is greater per-unit cost for the fewer potatoes produced in fields with poor stands.

Loss in stand is primarily due to seed-piece decay. Seed-piece decay is generally a result of the cut surface of the set not suberizing. This allows fungi to enter and rot the seed piece. The failure of the set to

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heal may be due to improper seed cutting methods, poor handling and selection and previous exposure of seed to field frost; bin heating; and various diseases. If the set decays (Fig. 1) after the potato plant has emerged, the blackleg bacteria can gain entrance and kill the vine.

Table 1. Total and U.S. No. 1 Cwt. per acre yields for 683 Eastern Idaho potato fields over a 4-year period grouped according to percent stand.

Percent Stands	Number Fields	Percent of Fields	Average CWT/Acre Total	U.S. No. 1
70	106	16.6	160.4	94.4
70-79	178	27.9	181.2	109.2
80-89	254	39.8	197.5	122.1
90-99	100	15.7	216.1	135.7

All factors necessary to obtain good stands of potatoes are under the direct control of the potato producer. Failure to have a good stand is due to the failure of the grower himself to provide necessary conditions. The general factors for obtaining good stands are selection and care of whole seed, cutting and handling the cut seed, seed bed preparation and planting, and post planting care and cultivation. These items are arranged so they may be used as a check list to be marked off as completed by the grower.

Figure 1. A potato plant with seed piece decay. The decayed set will produce an open wound through which blackleg bacteria can gain entrance and kill the potato plant later in the summer.

Selection and Care of Whole Seed

1. Certified seed should be used by all commercial potato growers. When non-certified seed is used there is also a chance there will not be a marketable crop at harvest because of seed-borne diseases. Serious seed and soil-borne disease organisms are more apt to be introduced with non-certified seed. The soil-borne disease organisms once introduced can reduce the value of the farm.

2. If sprouts are not already showing on the seed, warm it up for 2 weeks at 50°-55° F. prior to cutting.

3. Avoid for seed, tubers that show signs of field frost or cellar heating. There is evidence the cut surface of such seed does not heal as quickly as seed not subjected to chilling temperatures and cellar heating. This results in increased danger of seed-piece decay and chemical seed treatment would be required. Chilled and frost-injured tubers not allowed to bin heat will sprout in a normal manner whereas cellar-heated seed produces weak sprouts. These affected tubers can be described in the following manner:

Chilled Tubers. These tubers have no sign of necrosis due to frost. The seed will sprout in a normal manner. The tuber flesh may turn pink soon after cutting.

Frost-Injured Tubers. These tubers show internal flesh discoloration due to the damage of the cells.

Bin-Heated Tubers. Tubers allowed to get hot in a cellar may be pitted and have weak sprouts. Accompanying the heating in the cellar there is usually a lack of air movement through the potato pile. The devitalization of the sprout my be due to the lack of

Figure 2. The two rows on the left were planted from seed pieces less than 1½ ounces in size.

air exchange or a combination of air exchange and temperature.

4. Store seed under sanitary conditions. Storages should be sanitized in the following procedures:

a. Remove trash, old tubers and field soil from cellar.

b. Disinfect storage by thoroughly wetting walls, floor, partitions and ceiling with chemical disinfectant.

c. Steam clean or wash and disinfect all potato handling equipment.

CHEMICAL DISINFECTANTS

Chemical	Amount to Add to 10 gal. water	100 gal. water
Copper sulfate—very corrosive	2 lb.	20 lb.
Chlorine (Chlorox, B.K., Purex, etc.) 5% solution	1 gal.	10 gal.
Lysol—50% solution in soap	1 gal.	10 gal.
Formaldehyde—avoid breathing 40% solution	3.2 cups	4 gal.
Quaternary Ammoniums* (Roccal, Hyamine, Purina, etc.) 10% solution	1.6 cups	1 gal.

*Used mainly for ring rot control

Figure 3. The rows of weaker plants on the left center were the result of cultivating after a severe frost.

Cutting and Handling Cut Seed

1. For rapid healing (suberization) the seed must be cut in an area free from drafts. To obtain a high humidity keep the floor wet down and the doors closed.

2. A large seed piece produces a more healthy plant. The seed pieces should be blocky and weigh between 1½ to 2 ounces each. To check the seed size

weigh 100 seed pieces. If they do not weigh at least 10 lbs. they are too small.

3. As an added protection, seed treatment should be used. Growers who do not treat may have more difficulties with seed-piece decay. The chemical should be used according to the instructions on the label. If a poor job of treating is to be done then it is better not to treat. Application of the chemical in a dust formulation eliminates many errors experienced in spraying and dipping.

In a survey of 936 fields (Table 2) those growers who planted treated seed averaged higher yields.

Table 2. Five-year average cwt. per acre and percent of 936 Eastern Idaho potato fields when grouped according to whether a seed treatment was or was not used.

Comparison	No. Fields	Percent of Fields	Av. CWT/Acre Total	U.S. #1
No seed treatment	575	61.4	182.5	108.0
Seed treatment used	361	38.6	195.1	116.2

4. Cut seed should be "cured" if not immediately planted. Best healing takes place at temperatures between 45° and 50° F. in a humid atmosphere. If rain or mechanical breakdown stops planting operation put the seed in a damp cellar with the above temperature and close the door. To improve air movement the seed can be moved by re-piling.

5. Protect seed from sun and wind by covering the seed with a tarp when hauling to and handling in the fields.

6. Plant immediately after cutting unless special precautions are taken to suberize the cut surface.

Seed Bed Preparation and Planting

1. The soil should be moist and mellow (have the feel of 65% moisture) at the planting depth. Soil moisture should extend two or more feet below the soil surface. **Never Plant in a Dry Seed Bed.** To provide the correct moisture a preplanting irrigation either in the fall or spring is usually necessary.

2. Management at planting time is important. Have responsible people on the tractor and planter. Keep the planter speed under 4 miles per hour. Keep the planter in good mechanical repair and replace worn picks. Dig in the field occasionally to see how the planter is doing.

3. Planting depths vary from 4 to 6 inches from field level. Sprinkler irrigated fields usually require more depth (5 to 6") to prevent greening. Deeper than 6" can be just as detrimental as a shallow planting.

Post-Planting Care and Cultivation

1. Three or 4 days before emergence harrow or plank down the planting ridge for weed control.

2. Irrigate soon after emergence, and within 30 days after planting. This must be a light irrigation, usually 6 to 8 hours under sprinkler and just enough to wet across the hill to the seed piece under gravity. See your agricultural extension agent.

3. If there is a killing frost the first thing to do is to irrigate. Do not cultivate the potatoes (Figure 3) as this will only further weaken the plants. If there was adequate nitrogen at planting there is no need to add more nitrogen after the frost.

OTHER IDAHO POTATO BULLETINS

Potato Eumartii Wilt—Extension Bulletin No. 345
Potato Early Blight—Extension Bulletin No. 346
Potato Scab—Extension Bulletin No. 347
Malformed Potatoes—Extension Bulletin No. 348
Knobby Tubers—Extension Bulletin No. 349
Potato Verticillium Wilt—Extension Bulletin No. 350
Producting the Idaho Potato—Extension Bulletin No. 367
Potato Rhizoctonia—Extension Bulletin No. 377
Idaho Potato Storage Recommendations—Extension Bulletin No. 436
Potato Leaf Roll—Symptoms, Cause and Control—Extension Bulletin No. 457
Potato Ring Rot—Extension Bulletin No. 469
Timing Final Irrigation—Current Information Series 2
Potato Vine Killing in Idaho—Current Information Series 3
Better Stands Can Boost Potato Profits—Current Information Series 6
First Irrigation of Potatoes—Current Information Series 13
Press Wheels for Idaho Potato Planters—Current Infomation Series 29
Injury to Russet Burbank Potatoes by Different Harvesting Machines—Experiment Station Bulletin No. 218
Irrigation of Russet Burbank Potatoes in Idaho—Experiment Station Bulletin No. 246
Storing the Idaho Potato—Experiment Station Bulletin No. 296
Evaluation of Potato Varieties in Idaho—Experiment Station Bulletin No. 375
Control of Root Knot Nematode of Potatoes by Soil Fumigation—Experiment Station Bulletin No. 380
Idaho Potato Storages—Construction and Management—Experiment Station Bulletin No. 410
Potato Production Costs—Experiment Station Bulletin No. 447

Copies may be obtained from your county agricultural agent.

PESTICIDE RESIDUES: These recommendations for use are based on the best information currently available for each chemical listed. If followed carefully, residues should not exceed the tolerance established for any particular chemical. To avoid excessive residues, follow container label recommendations carefully with respect to dosage level, number of applications, and minimum interval between application and harvest.

THE GROWER IS RESPONSIBLE for residues on his crop as well as for problems caused by drift from his property to other properties or crops.

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