

POTATO EYES



Vol. 18, Issue 1, Spring 2006 • Alexander D. Pavlista, Ph.D., Extension Potato Specialist
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Disease Reference Guides for Growing Season

The 2006 growing season is rapidly approaching. So now would be an excellent time to review common diseases and defects affecting planting and harvest. The following tables are brief guides as to what may be anticipated and how to avoid or deal with the possibilities from seed cutting to storage.

● **Page 1** is a Reference Guide for Common Diseases

Associated with Seed Cutting to Emergence,

● **Page 2** is a Reference Guide for Common Diseases

Associated with Planting to Early Bulking,

● **Page 3** is a Reference Guide for Common Diseases

Associated with Tuber Bulking to Harvest;

● **Page 4** is a Reference Guide for Common Tuber

Defects Associated with Planting and Harvest.

Reference Guide for Common Diseases Associated with Seed Cutting to Emergence.

Problem	Cause	Appearance	Action
Seed Piece Decay	Bacterial and/or Fungal Borne on Seed Resulting in Decay, Poor Emergence and Weak Plants.	Rust to Black Spots or Sunken Areas at Cut Surfaces that Enlarge, Blacken and Become Slimy.	Warm before Cutting (50-60 F), Heal Bruising, Clean Equipment, Sharpen Knives, Disinfect Knives, Disinfect Rollers, Disinfect Often, Treat Seed-Pieces, Heal after Cutting (60F,Air,Humidify), Plant Seed-Pieces Warmer than Soil, Plant when Soil is 50 F or Higher, Avoid Cold/Wet and Hot/Dry Soils.
Rhizoctonia Wilt and Pinching	Fungus Borne on Seed (Black Scurf) and in Soil Resulting in Wilting, Stunting, and Leaf Roll.	Brown Rectangular Areas on Stolon, Stem and Young Tubers Progressing Inward Resulting in Pinched Stolons, Shriveled Tubers, Discolored Vascular Tissue, and Wilted Plants.	Avoid Seed Tubers with Black Scurf, Use Seed Treatments, Promote Rapid Emergence by Using Pieces with Bud Break and Plant Warmer Pieces in 50F Soil, Work Soil, Avoid High %OM Soil, Plant Green Manure in Fall.
Fusarium Wilt	Fungus Borne on Seed (Dry Rot) and in Soil Resulting in Wilting and Early Death. Note: Infection Only Occurs Through Wounds.	Brown to Black Vascular Tissue in Stem Spreading Upward Resulting In Plants Turning Yellow Then Bronze Then Brown and Dead.	Avoid Seed Tubers with Dry Rot, Avoid Bruising During Handling,, Avoid Tubers with Adhered Soil, Warm Tubers before Cutting,, Sharpen Knives, Disinfect Cutting Operation, Treat Seed Pieces, Heal Pieces after Cutting, Promote Rapid Emergence by Use Pieces with Bud Break and Plant Warmer Pieces in 50F Soil, Avoid Damaging Plants During Cultivation.

Disease Reference Guides, continued

Reference Table for Common Diseases Associated with Planting to Early Bulking.			
Problem	Cause	Appearance	Action
Black Leg Erwinia Wilt Bacterial Wilt	Bacteria Borne on Seed (Wet Rot) and in Soil Resulting in Severe Seed Decay, Yellowing, Stunting, Leaf Roll, Blackening and Wilting of Infected Plant.	Black, Wet Tuber and Seed Pieces, Pieces Rot after Planting, Black, Collapsed Stem Tissue with Slime Oozing Out at Base of Plant, Infection Starts in Stem Center (Pith) and Progresses Outward and Upward Resulting in Plants Turning Black, Wilting and Death.	Do Not Store or Use as Seed Tubers from Infected Fields, Cull Infected Tubers at Harvest and in Storage, Avoid Tubers from Infected Fields or Storage or Show Signs of Rot, Disinfect Storage Facility, Sharpen Knives, Disinfect Cutting Operation, Disinfect Repeatedly, Avoid Poorly-Drained Fields, Avoid Fields with History of Black Leg (Bacterial Wilt).
Verticillium Wilt Early Dying	Fungus Borne in Soil Entering Plant Through the Roots.	Discoloration of Vascular Tissue Often on One Side and Progressing Upward Through Stem, Initially One Side of Plant Wilts and Turns Brown Later the Vascular Tissue Turns Brown Completely and the Whole Plant Wilts and Dies.	Avoid Planting in Field with History of Verticillium Wilt, Avoid Irrigating after Planting before Emergence, Avoid Drying after Emergence, Fumigate Fields with History of Early Dying, Plant Green Manure in Fall.
Potato Leaf Roll Virus	Virus Borne in Seed and by Aphids Resulting in Stunting and Leaf Roll.	From Seed Moves Upward in Stem to Upper Leaves Causing a Severe, Tight Leaf Roll and Stiffness of Leaves Giving a “Rattle” Sound when Shaken. Aphids Especially the Green Peach Aphid Transmits from Plant to Plant, Later Season Infection on Any Leaf Resulting in Stiff Plants. Leaves Roll, Yellow and Stiffen.	Eliminate Cull Piles, Control Host Weeds, Avoid Infected Seed Tubers, Monitor and Treat for Green Peach Aphids and Aphids in General, Desiccate Vines.
Common Scab	Bacteria Borne in Soil (Main Source of Inoculum) and on Seed, Resulting in Pits on Harvested Tubers.	Irregular, Brown, Corky Areas on Tuber Surface that May Be Slightly Raised, Brown, Corky Pits Through Skin.	Avoid Acid to Neutral Soils Between 5.4 and 7.4 But Some Strains Occur in More Acid and Basic Soils as Well, Avoid Liming, Avoid Fields with History of Scab, Maintain High Soil Moisture during Early Bulking, Apply Ammonium Sulfate.

Disease Reference Guides, continued

Reference Table for Common Diseases Associated with Tuber Bulking to Harvest.			
Problem	Cause	Appearance	Action
Early Blight Target Spot	Fungus Borne on the Wind, Resulting in Leaf Death and when Severe Stem Death.	Small, Roundish, Brown Spots with Concentric Rings Starting on Lower and Older Leaves, Spots Enlarge and Fuse, Spreads to Stem Darkening Them, Opportunistic Pathogen that Attacks Older or Stressed Leaves and Plants, Plant Wilts and Dies in a Few Weeks, At Harvest, Infected Soil Can Infect Tubers During Lifting.	Eliminate Cull Piles, Control Host Weeds, Provide Adequate Nutrition, Provide Adequate Irrigation, Control Pests Weakening Plant, Avoid Stressing Plants, Monitor Lower Leaves Often, Use Prediction Model (P-Days), Treat Foliage when Model Predicts Conditions Are Favorable.
Late Blight	Fungus Borne on Seed and on Wind, Resulting in Rapid Leaf and Stem Death.	On Leaves, Initially Large Brownish Area Surrounded by Yellow or Pale Green Halo, Later Leaf Turns Black and Disease Spreads to Stem Via Petiole Turning Stem Black; Newer Strains May Attack Stem and Flowers Directly Turning Them Black; Plant Wilts and Dies Rapidly in Several Days. At Harvest, Spores Can Move Through Soil and Infect Tubers. Infected Tubers Often Get Infected by Erwinia Soft Rot.	Eliminate Cull Piles, Control Host Weeds, Avoid Infected Seed, Avoid Planting in Wet Areas, Plant in Well-Drained Fields, Avoid Standing Water, Provide Adequate Nutrition, Monitor Leaves and Upper Stem Often Especially in Wet Areas, Use Prediction Model (S-Values), Treat Foliage when Model Predicts Conditions Are Favorable, Desiccate Vines.
Fusarium Dry Rot	Fungus Borne in Soil Entering Tubers Through Wounds during Harvest and Handling into Storage Resulting in a Dry Internal Decay.	Small, Dark Brown Wounded Areas that Turns Dry and that Grows Deeper into Tuber Forming a Dry Mealy Inside.	Avoid Harvesting in Dry Soil and Ground with Clods, Vine Desiccate, Avoid 6-inch Tuber Drops, Heal Tubers before Storage, Store Well Aerated, Limit Pile Height.
Wet Rots: Erwinia Soft Rot, Pythium Leak, and Pink Rot	Soft Rot: Soil-Born Bacteria, Leak and Pink Rot: Soil-Borne Fungi; All Result in a Wet Decay in Storage; All Enter Tuber Through Wounds and/or Swollen Lenticels (Pores).	Soft Rot: Vascular Discoloration to Complete Decay, Internal Tissue Turns Creamy and Soft Often with Dark Margins, Skin May Remain a Shell. Leak: Starts as Tan, Wet Area Around Wound, Internal Tissue Turns Spongy and Then Becomes Liquified, Strong and Pungent Smell Emanates. Pink Rot: Tubers Are Soft and rubbery, when Squeezed Liquid Oozes, Cut Flesh Turns Pink when Exposed to Air.	Avoid Fields with History of Soft Rot, Leak or Pink Rot, Plant in Well-Drained Fields, Treat Plants In-Furrow and/or to Foliage for Leak and Pink Rot, Avoid Harvesting Wet Areas, Avoid Over-Irrigating at End of the Season, Vine Desiccate, Avoid 6-inch Tuber Drops, Heal Tubers before Storage, Store Well Aerated in Cool Temperature and Controlled Humidity, Avoid Condensation in Storage, Limit Pile Height.

Disease Reference Guides, continued

Reference Guide for Common Tuber Defects Associated with Planting and Harvest.			
Problem	Cause	Appearance	Action
Black Heart	Lack of Oxygen in Storage, Not Providing Adequate Fresh Air in Storage Resulting in Poor Emergence.	Black or Brown Star-Shaped Area at Center.	Storage: Heal Tubers, Ventilate, Circulate Air, Limit Pile Height
Freezing Damage	Cold Exposure in Storage or During Handling Resulting in Poor Emergence.	Gray-Brown-Black, Soft and Watery Areas from Cell Death, Possibly a Net-Like Spotting, Possible Shriveling .	Storage: Maintain Temperature Above 36 F, Avoid Cold Spots, Avoid Condensation and Water Drips.
Misshapen	High Temperature Stress during Bulking.	Various Shapes: Dumbbell, Pointy End, Kidney, Knobs	Weather cannot be controlled. Plant Tolerant Varieties, Avoid Other Stresses such as Excessive Nitrogen and Non-Uniform Irrigation.
Oversize Green	Bulking Too Long; Exposure to Sunlight.	Unmarketable Tubers Due to Being Too Large and/or Green	Check Planter for Skips, Space Pieces Closer Based on Variety and Market Need, Maintain Hill Structure, Plant Aged Seed-Pieces, Apply Proper Fertilizer, Avoid Late Season Nitrogen, Monitor Petiole Nitrogen, Vine Desiccate.



The Nebraska Potato Eyes

is on the World Wide Web at:

www.panhandle.unl.edu/peyes.htm