North Dakota State NDSSD Seed Department

Presentation to Interim Agriculture Committee

Ken Bertsch
ND State Seed Commissioner

Fargo, ND
April 25, 2012

North Dakota State NDSSD Seed Department

State Seed Department
Agency Background and History

- Established 1931, ND Legislative Assembly
- State Designated Authority: Statutory
  - Seed certification (field crops and potatoes)
  - State Seed Laboratory
  - Seed Regulatory
  - State/Federal cooperative programs
- Unique structure/mission among peers
  - "One-Stop" function: Field crops, potato, seed regulatory, seed testing, foundation seed production (potato)
  - Board Directed (Citizen)
  - Self Funded- Service Fees

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ND State Seed Commission

Bob Christman, Chairman
ND Dept. of Agriculture

Ken Bertsch, Commissioner
ND State Seed Department

Kim Alberty, West Fargo
ND Agriculture Association

David Fiebiger, Finley
ND Grain Dealers Assn.

Lance Fugleberg, Portland
ND Dry Edible Bean Growers Assn.

Nick Otto, Crystal
ND Potato Council

Mark Birdsall, Berthold
ND Crop Improvement Assn.

Brad Nilson, Hoople
Northern Plains Potato Assn.

Dr. Ken Grafton, Fargo
NDSU VP for Agriculture

John Thiele, St. Thomas
ND Cert. Seed Potato Growers

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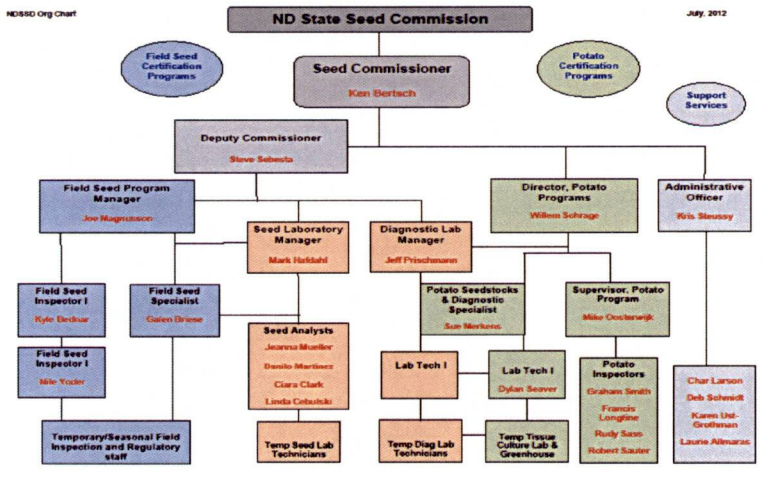
Agency Organizational Chart



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Agency Programs/Services

Administration

Field Seed Certification

Laboratory Services

Seed Regulatory

Potato Certification

"To assure the integrity of the seed industry through a commitment to client service and product quality"

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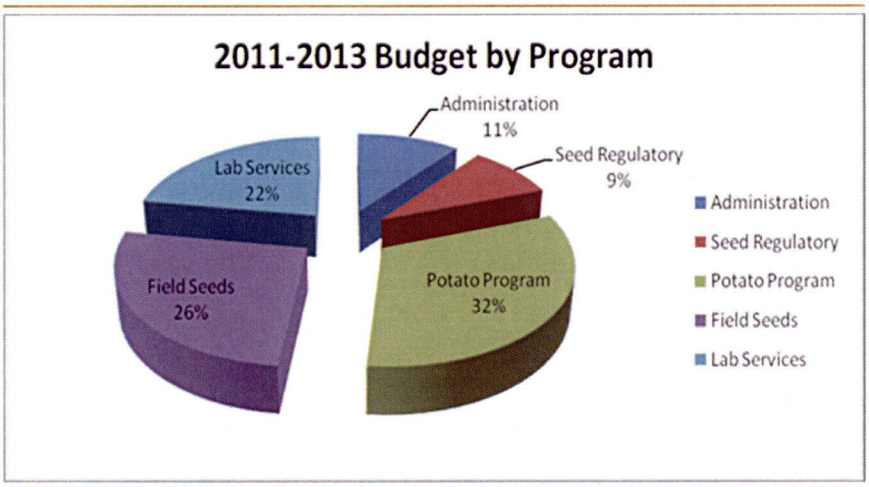
Program Budget Allocation



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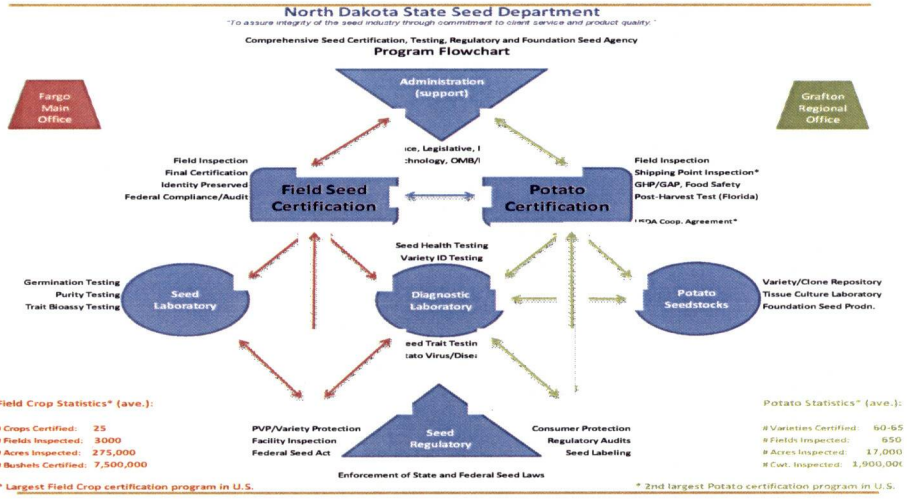
Program Flowchart



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Administration

- Coordination of administrative functions
- Technology (ITD, vendors)
- Human resources
- Budget administration
- Legal
- Equipment and capital improvements
- Support services

Administrative Officer, Kris Steussy

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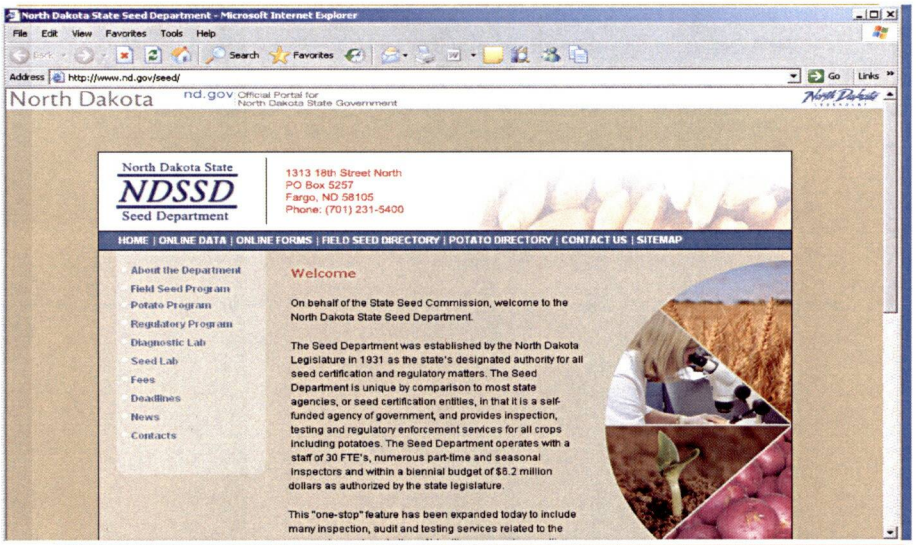
Web-Based Information



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Web-Based Information

- Secure customer access
  - Field data, laboratory test results
- Improved business services
  - On-line application forms
  - Seed Sampler's Report
  - Seed bulk certificates (labels)
- Information resources
  - Seed directories
  - Field and seed standards for all crops
  - Administrative Rules proposals

ndseed.com

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Field Seed Certification Program

Field Seed Inspection

Seed Final Certification

Custom Programming

Seed Promotion

Technical Assistance

Seed Conditioner & Facility Approval

Program Manager: Joe Magnusson

NDCC 4.1-53 (4-09, 4-09.1, 4-25, 4-42)

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Field Seed Certification Program

- Purpose: Product certification and assurance of quality factors
- Field inspection and lab analysis based on specific field and crop standards
- Association of Official Seed Certification Agencies (AOSCA)

* ***Largest field crop certification program in U.S***

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4-Step Certification Process

1. Field Inspection
2. Final Certification
3. Conditioner/Facility Approval and Licensing
   (for handling of certified seed products)
4. Seed Regulatory Inspections

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Field Inspection Training

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Field Seed Inspection

Step 1

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Final Certification

- 2-part process

Step 2

1) Laboratory analysis
   - Germination
   - Purity
   - Presence/absence of noxious weeds
   - Presence/absence of disease
   - Genetic analysis for variety identification

2) Grading (results approved, certification staff)

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Conditioner and Facility Approval

- Annual Inspection and Approval process
  - Ensuring ability to handle, segregate and market quality seed products
- Technical Support
  - New facility construction
  - Facility improvements
  - Conditioning processes
  - Compliance with standards

Step 3

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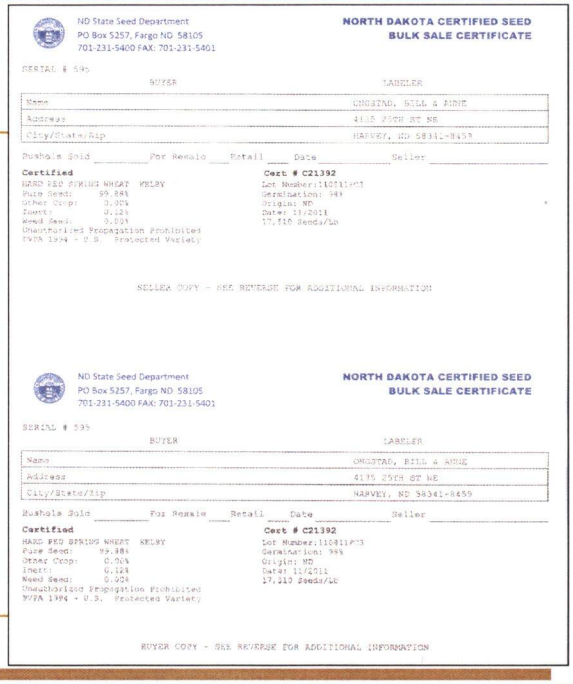
Labeling

*** Identifies all critical information required for correct and accurate labeling of seed (labelers duty)**

- Variety
- Final certification results (lab)
- Lot (application) #
- Class
- Amount
- Grower/labeler
- PVP status
- Disclaimer (reverse side)

Provided by Seed Department to grower/labeler: retailer/labeler completes and reports to NDSSD



ND State Seed Department
PO Box 5257, Fargo ND 58105
701-231-5400 FAX: 701-231-5401

NORTH DAKOTA CERTIFIED SEED BULK SALE CERTIFICATE

SERIAL # 595

BUYER	LABELER
Name	ONGSTAD, BILL & ANNE
Address	4135 25TH ST NE
City/State/Zip	HARVEY, ND 58341-8459

Bushels Sold _____ For Resale ___ Retail ___ Date _____ Seller _____

Certified
HARD RED SPRING WHEAT KELBY
Pure Seed: 99.88%
Other Crop: 0.00%
Inert: 0.12%
Weed Seed: 0.00%
Unauthorized Propagation Prohibited
PVPA 1994 - U.S. Protected Variety

Cert # C21392
Lot Number:110811F3
Germination: 98%
Origin: ND
Date: 11/2011
17,510 Seeds/Lb

SELLER COPY - SEE REVERSE FOR ADDITIONAL INFORMATION

ND State Seed Department
PO Box 5257, Fargo ND 58105
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Seed Regulatory Program

- Primary Objective: Consumer Protection
  - Ensuring label claims meet actual product quality
- Responsibilities
  - Enforcement of state and federal seed laws
  - Regulation of seed labeling and sales
- Compliance and Enforcement Measures
  - Sampling, testing, auditing….."Stop Sale"
  - Administrative fines levied: violations
- Plant Variety Protection (PVP), state regulatory responsibility
  - PVP Title V: "Sold as class of certified seed" (Foundation, Registered or Certified)

Step 4

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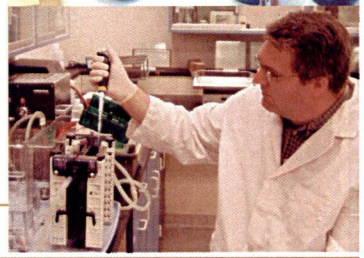
Laboratory Service Programs

Seed Laboratory

Seed Lab Manager
Mark Hafdahl, BS, RST

Diagnostic Laboratory

Diagnostic Lab Manager
Jeff Prischmann, MS, RGT



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Seed Laboratory

- Statutory designation: "State Seed Laboratory"
- Seed purity and germination
- Primary support
  - Field Seed Program, final certification
  - Regulatory Program, germination and purity testing
- Herbicide trait tolerance, bioassay methods
- Service testing: regional customer base
- AOSA (Association of Official Seed Analysts)

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Diagnostic Laboratory

- Primary support for Potato Program
  - Potato virus/pathogen/disease testing
- Variety identification; wheat, barley and field peas
  - Certification requirement in ND (only state requiring VID)
  - Technology…limits types of crops subject to testing
- GM trait/event testing
  - Protein based: ELISA
  - DNA based: PCR
- Plant health and pathogen testing
- SCST (Society of Commercial Seed Technologists)

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Potato Certification Programs

- Purpose: Product certification and assurance of quality factors (similar to FS)
- Visual inspection and lab analysis based on tolerance for disease, virus and varietal purity
- Grade inspection of tuber quality and defects
- Priorities: Seed source pedigree/eligibility and damaging diseases (bacterial ring rot, late blight).
- Highly reliant on seed quality, isolation, environment, cleanliness of operation, precision of grower

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NDSSD Grafton Office

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Potato Seed Production: Broad Range of Challenges

- **Perishable commodity: storability issues**
- **High production costs – high level of market risk**
- **Variety identification: True variety, selection, clone or mutation?**
- **Zero tolerance diseases (Bacterial Ring Rot); potential for litigation for grower and certifier**
- **Shifting targets: virus mutation (PVYntn)**
- **Symptomless diseases and "masking" varieties**

**** Despite challenges: ND is second largest potato program in US***

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Potato Seed Law

4-10-06.1. Seed potatoes - Certification requirement.

1. A person may not plant seed potatoes in lots of one acre [.405 hectare] or more, for the purpose of selling the crop to be harvested, unless the seed potatoes:
   a. Have been certified by the commissioner as meeting the standards of this chapter;
   b. Have been certified by another state or province having a similar seed potato quality assurance program; or
   c. Have been field inspected and approved by the commissioner.

2. **The commissioner shall permit a North Dakota grower to plant uncertified potatoes grown by the grower, if the grower is within twelve months of having the grower's own certified parent seed potatoes.**

3. The commissioner shall permit a North Dakota potato grower to sell or otherwise transfer certified seed potatoes to another North Dakota potato grower. The recipient grower may plant the seed potatoes only for commercial production. The seed potatoes may not be recertified or retained for use in the following production cycle.

4. If the commissioner has reason to believe that seed potatoes meeting the requirements of this section are not available in sufficient quantities to fulfill planting needs, the commissioner may permit the planting of seed potatoes with a higher disease content, provided that bacterial ring rot is not present and that a serious disease threat is not posed.

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Components of ND Seed Program

1. Tissue Culture/Nuclear Seed Production
2. Field Inspection (lab testing confirmation)
3. Shipping Point Inspection (final certification)
4. Winter Test Inspection (visual and lab test)

Program Director: Willem Schrage
N.D.C.C. Chapters 4-10, 4-26

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Potato Seedstocks

- Production of Foundation class, disease-free seed under controlled, sterile conditions
- Quarantine environment, tissue culture lab
- Tissue culture/variety bank
  - 75-100 distinct varieties
  - 3-4 clones, each variety
  - Repository: NDSU varieties
- Main supplier of nuclear generation seed to ND Potato Industry

Step 1

Seedstocks Production Manager
Susan Merkens

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Potato Tissue Culture

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Micro-propagation (rapid multiplication)

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Greenhouse planting

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Greenhouse Production

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Potato Field Inspection

- Potato Seed Production: Highly reliant on quality of seed planted, isolation, cleanliness and precision of grower farm

Step 2

- Based on visual factors, plant growth
  - Intensive (3 inspection minimum)
  - Inspection factors: nearly invisible to untrained eye
  - Disease/virus factors are primary
  - ND standards outlined in Administrative Rules
- Limited Generation systems (nationwide)
  - Pre-nuclear, Generation 0-5, Certified class (commercial)
  - Commonly referred to as "flush-through" system

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Field Inspection Training

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Administrative Code: Field Inspection Standards

74-04-01-08. Field inspection standards.

1. Each seed potato field will be visually inspected based on sample inspection. The method of inspection and sample size will be at the discretion of the state seed department but a minimum of one hundred plants per acre [.40 hectare] will be inspected. For varieties that do not express readily visible symptoms of a disease, laboratory testing may be done for the pathogen.

2. The field tolerance established will be based on visible symptoms in the samples inspected. Diseases which cannot be observed visually may be present.

	First Inspection Tolerances (%) Foundation Class Generation						Certified Class Generation
	0	1	2	3	4	5	0-6
Varietal mixture	0.1	0.2	0.3	0.5	0.5	0.5	0.5
Spindle tuber viroid	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Severe mosaics (PVY)	0.2	0.3	0.4	0.5	0.5	0.5	1.0
Leaf roll (PLRV)	0.2	0.3	0.4	0.5	0.5	0.5	1.0
Total serious virus	0.2	0.3	0.4	0.5	0.5	0.5	1.0
***Bacterial ring rot**	0.0	0.0	0.0	0.0	0.0	0.0	0.0

***Tolerances are more strict on second inspection**

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Variety Determination

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PVY (mosaic)

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PVY: barely visible symptoms

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Late Blight (low tolerance)

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Ring Rot (zero tolerance)

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Shipping Point Inspection

- Visual analysis of physical quality factors of harvested tubers
  - rots
  - hollow heart
  - size/weight/shape etc.
- USDA-AMS Cooperative Agreement
  - USDA Commodity Grade standards for vegetable inspection (potatoes, onions)
  - Examine internal and external defects of tubers
- Provided for seed and commercial production

Step 3

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Shipping Point Inspection

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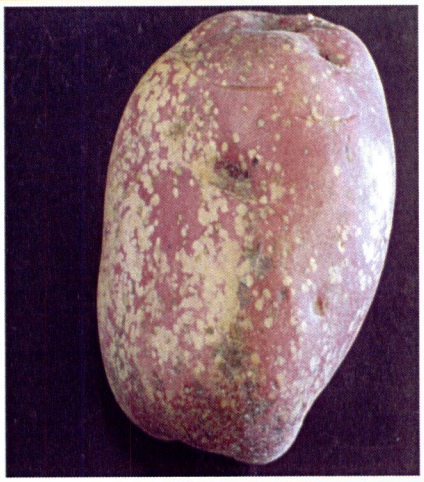
Fusarium, Scab



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Administrative Code: Grade Inspection, Physical Quality Standards

74-04-01-11. Official North Dakota seed potato grades.

Final grade determination shall be made based on physical defects, size, shape, and cleanliness. The potatoes will be packed in new burlap sacks or clean, disinfected containers identified by official tags attached as to variety, crop year, and grower and accompanied by an official state or federal grade certificate. United States department of agriculture revised standards, effective March 2010, for seed potatoes shall be the official guide for applying and interpreting all definitions and terms used in North Dakota seed potato grades. Grade inspection will be made on a sample basis.

1. **First grade blue tag** seed potatoes shall consist of unwashed potatoes of one variety which must meet the following requirements:

(each grade followed by numerous quality factors)

2. **Second grade yellow tag** potatoes shall consist of unwashed potatoes that meet the requirements for blue tag grade except for defects caused by hollow heart, wireworm, internal discoloration, firmness, sprouts, and sunken, flattened, or depressed areas with or without underlying flesh discolored, and are not seriously damaged by soil and for increase in maximum size, and for increased tolerance for defects listed below:

3. **White tag**. The white tag North Dakota-certified seed potato grade shall consist of certified seed potatoes of one variety that are graded according to agreement between the seller and the purchaser as to size and defects. The official label must be used and marked as white tag.

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Labeling

* Identifies all critical information required for correct and accurate labeling of seed

- Variety
- Lot (application) #
- Generation
- Winter test status
- Class
- Grade (blue, yellow, white)
- Amount
- Grower/labeler
- Disclaimer

Provided by Seed Department to grower: completed by grower

North Dakota Certified Seed Potatoes

2012 Crop Year

NORTH DAKOTA STATE SEED DEPARTMENT

P.O. Box 6157
State University Station
Fargo, ND 58105
Phone: 701 231 5400
Fax: 701-231-5401

BULK CERTIFICATE FOR ND CERTIFIED SEED POTATOES

This document/label certifies that _____ cwt of seed potatoes in (bulk) or _____ (bales) of the VARIETY (selection) _____ were shipped by vehicle number(s) _____

Receiver _____ Address: _____

The seed was inspected under N. D. certification rules; FIELD APPLICATION #: _____

GENERATION: _____ Winter Tested: (Yes) (No)

CLASS: (Foundation) (Certified) Virus X tested: (Yes) (No)

The seed potatoes are packed according to the following specifications:

Shipping Point Inspection Certificate (FV 184) numbers:

_____ Cwt. ND Blue Tag _____

_____ Cwt. ND Yellow Tag _____

_____ Cwt. ND White Tag _____

_____ Cwt. ND GRADE _____

Seed Potato Grower/Labeler NAME _____

ADDRESS _____

Phone: _____

Fax _____

SIGNATURE _____ Date _____

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Post-Harvest Testing

- Objective: Determination of virus carryover, varietal purity/admixture, chemical damage, other factors affecting eligibility for recertification
- Requirement for re-certification of seed
- ND Winter Test: Homestead, Florida
- ND Cert. Seed Potato Growers Association: own property; pay winter test project costs

Step 4

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Florida Winter Test

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Potato Program: 2011 Facts and Figures

Total acres inspected	**17,810**
Total fields/lots inspected	**584**
Varieties/clones inspected	**69**
Potato seed growers	**32**
Shipping Point inspections	**2652**
CWT inspected	**1,931,790**
GHP/GAP operations	**30**
Counties inspected in (field inspection, shipping point, GHP/GAP)	**27**

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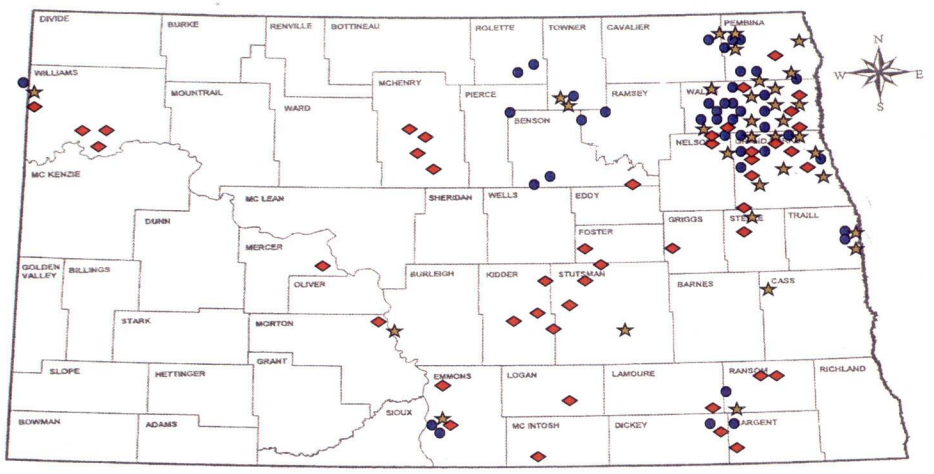
Potato Program Inspections



● = Seed production ◆ = GHP/GAP audits, field sites ★ = Shipping point

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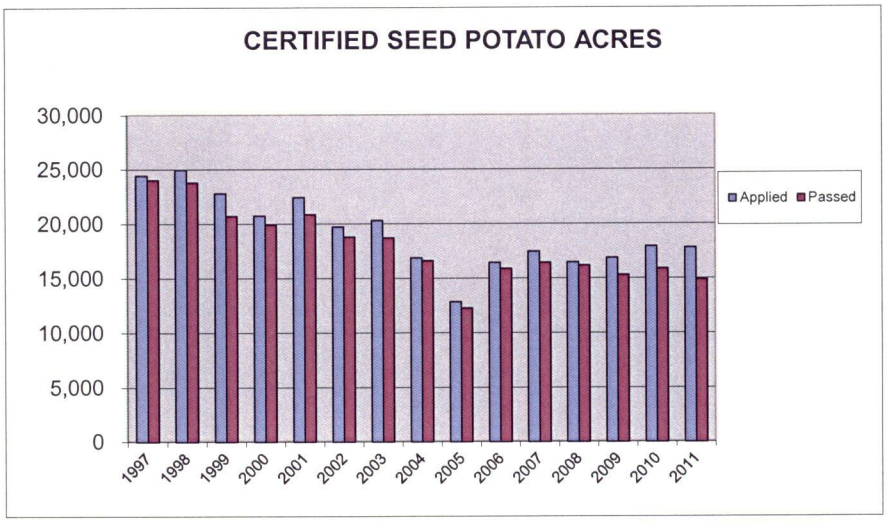
ND Seed Potato Industry



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Seed Certification Challenges: Risk/Reward (all crops)

- Presumptive Inspection (variety): dependence on pedigree of seed source, breeder variety description, similarity of visual characteristics
- Meeting a standard of care requiring responsibility for issues in control of the producer (snapshot)
- Current risk revolves around variety/traits, disease determinations
- Future risks:
  - Traceability
  - Variety identification
  - Presence of novel diseases/pathogens

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Production/Certification Process "Where does responsibility rest?"

Planting/Application: → Grower
Field Inspection: → NDSSD (1-3)
Harvest/Handling/Storage: → Grower
Testing: → NDSSD (grower sample)
Product "Certified": → NDSSD
Product Labeled: → Grower, Conditioner
Product Sold/Handled/Delivered: → Retailer
Product Handled/Planted: → Producer

The $6,000,000 question...literally:
Who is responsible if something goes wrong?

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Summary

- Challenges
  - Meeting customer expectations for services
    - Good Handling/Good Agriculture Practices Audits (food safety)
    - Identity Preserved programs
    - Variety protection (public and private owners)
  - Balancing high quality standards with seed grower needs
  - Legal: Litigious environment
  - Ensuring financial stability: Balancing service fees, cost of operation and "breakeven" philosophy
  - Ensuring improved varieties and traits developed by breeders reach commercial growers

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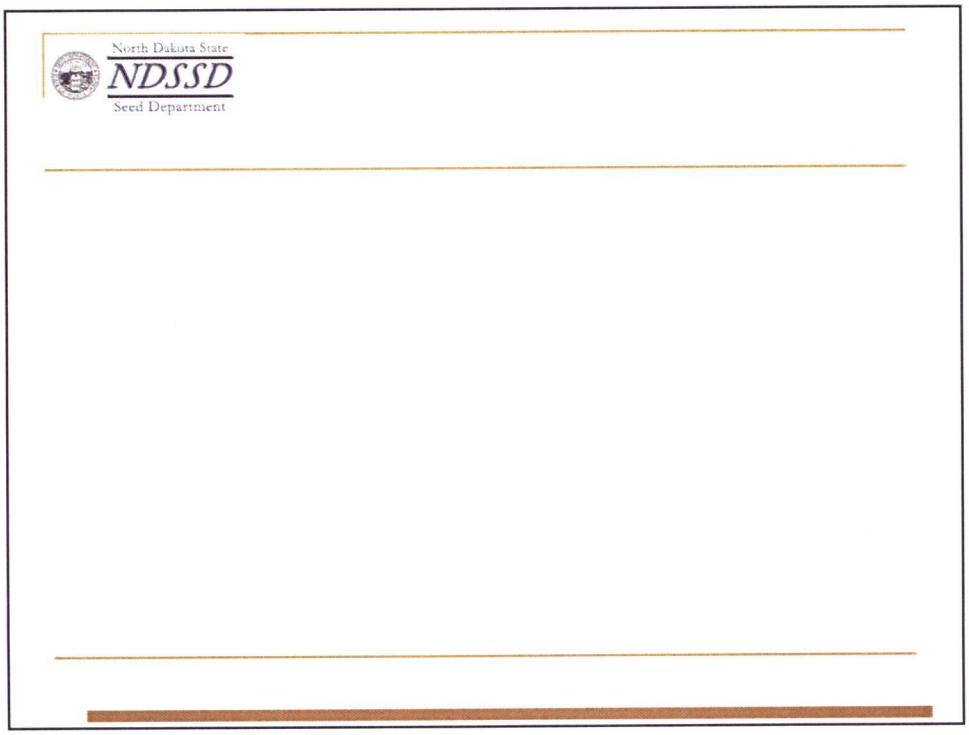
The Seed Commission Thanks You!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