# SA400 Quality Assurance Course

NEW

**Tuesdays, 1:00pm – 2:00pm CST**

**January through March 2023**

Seed Academy

## Solving Seed Quality Issues.

The Quality Assurance online course addresses real world seed quality issues identified in the field, seed plant or with laboratory testing and works to identify the "root cause". Problems can be submitted or are taken from archives and reviewed. Course is presented as twelve (12) one-hour online classes on specific crop species. We encourage enrollment in all crops because 'root cause analysis" maybe be relevant to your specific focus species. **3 P's = Physical, Pathological and Physiological quality issues.**

**References:** *"Seeds" Physiology of Development, Germination and Dormancy.* 3rd edition. 2013. J. Derek Bewley, Kent J. Bradford, Henk W.M. Hilhorst and Hiro Nonogaki.

**Target Audiences:** Agronomists**,** Corporate, Production/Conditioning/QA Managers and Laboratory Staff involved in the Seed Industry.

**Testimonials:** *"A valued educational experience for anyone involved in seed development, production, and quality assurance".* **Bob Wyffels. 2022 Seed Academy participant**.

### Topics Covered Include:

*The 3 P's Concept of Quality*
*Maize (corn) - Physical*
*Maize - Pathological*
*Maize - Physiological*
*Soybean - Physical*
*Soybean – Pathological & Physiological*
*Sorghum – Phys/Path/Physiol.*
*Sunflower - Phys/Path/Physiol.*
*Cotton - Phys/Path/Physiol.*
*Wheat & Small Grains – 3 P's*
*Hybrid & Cultivar Purity Tests*
*Small-seeded Vegetables*

**Our instructor: Tim Gutormson,** brings 43 years of seed technology experience in seed testing, developing test methods and solving seed quality issues. He has also instructed college level courses, seed quality workshops, and webinars for 30 years. Tim has BS and MS degrees in Agronomy, is a Registered Seed Technologist, past president of SCST, past chairman of the American Seed Research Foundation and the current chairman of Seed Testing Research Foundation. Tim is currently CEO and Seed Physiologist on staff at SoDak Labs, Inc., located in Brookings, South Dakota.

**Course Fee:**
**Individual** - $500 (Course fees are donated to Seed Testing Research Foundation (STRF) a 501 c 3 entity.
*Includes one session per week (live or recorded) for 12 weeks, one Seed Academy T-Shirt, Certificate of Completion and name submitted for Continuing Education points.*

**Please Register by January 6, 2023**

Online at www.SoDakLabs.com

Call Laura at 605-692-2758

Email Registrations@SoDakLabs.com

Seed Academy

**Join us Tuesday at 1:00-2:00 PM Central Time**

January 10 – Diagnosing a Seed Quality Issue: We will review how logically sorting through the Physical, Pathological, Physiological, Cultural/Phytotoxic and Genetic impacts on quality will lead to identifying the "root cause" of the quality issue. Review control samples & temperature monitoring.

January 17 – Maize (Corn) Physical factors: Discuss hybridity, double fertilization seed development, embryo, and endosperm development. Also cover Physical factors of seed moisture, mechanical damage, handling, and artificial drying on seed quality. Morphology case study: 1) Low germination from multiple laboratories.

January 24 – Maize Pathological factors: Review field (*Gibberellin and Diploidia*), and storage fungi (*Aspergillus, Penicillium & Rhizopus*) infection of plant/seed. Review seed moisture and storage impacts on storage fungi development. Identify fungi, bacteria species in laboratory germination tests. Aged seed case study: High warm germination, low cold test on older seed.

January 31 – Maize Physiological: In-depth review of three cold test methods: 40F, 50F and 50F Saturated cold. Mechanical damage seedlings found in warm germination tests, stunted shoots, shredded leaves and insufficient root growth and causes.

February 7 – Soybean Physical: We will review seed morphology, seed moisture and hilum shapes/colors. Demonstrate the seed coat damage test (soak test) using coffee. Discuss visual rating and visual damage test methods.

February 14 – Soybean Pathological & Physiological: Compare mechanical damage and root development in paper and sand medias. Discuss both 50F cold and Accelerated Aging test principles and usage on soybean vigor. Review impact of fungi on germination (*Phomopsis, Cercospera, Fusarium, Aspergillus and Penicillium*). Case Study: field emergence 50% of planted populations with a 90% warm germination.

February 21 – Sorghum: Discuss hybridity, double fertilization, seed development and morphology. Review physical and visual quality issue. Discuss warm germination and cold testing for seed vigor. Case study on export lot with destination germ of 68% and new crop germ of 92%.

February 28 – Sunflower: Discuss hybridity, double fertilization, seed development and morphology. Review physical and visual quality issue. Discuss warm germination and cold testing for seed vigor. Case study on breaking seed dormancy immediately after harvest.

March 7 – Cotton: Focus on the cotton cool test looking at testing method variables and influence on results. Case study: Compare seedling growth based on Heat Units versus Days.

March 14 – Wheat & Small Grains: Discuss germination and Fusarium spp. interactions, on seed quality. Discuss vigor testing methods, mycotoxin analysis and sand germination testing methods.

March 21 – Hybrid and Cultivar Purity Tests: Review visual methods (hilum, seedling, chemical), electrophoresis (PAGE, IEF, Isozymes), HPLC, SNPs and field growouts.

March 28 – Vegetables: Compare AOSA and heat stress germination, sand emergence and calculation of leaf area based on photograph and Heat unit adjustments.