



Seed quality control system and organization, seed village concept; Seed production agencies, seed industry and custom seed production in India.

What is Quality and Quality Assurance?

- Seed quality generally is defined as **whatever the customer expects.**
- This includes, the seed itself, but also items associated with the seed including service, price and the seed company's reputation.
- Quality is a **perceived value.**
- Consequently, it may be almost as important to have a good looking seed package as it is to have a high germination percent.
- While "quality" is intangible, those of us in the seed industry must remember: "**The customer knows quality when he sees it.**"

Management Commitment

- A good quality assurance program starts with established functions , goals/objectives, action plans, including a set of quality standards.
- An important aspect of quality assurance is a systematic problem solving technique including the handling of customer complaints.
- If a complaint is handled quickly and to the customer's satisfaction, the vast majority of them will do business with you again.

Cooperative Effort

- Having the quality group referred to as **Quality Assurance** is preferred over **Quality Control**.
- The word "**control**" implies that the quality group is solely responsible for quality, that they will take care of it and the employee running the conditioning equipment, for example, doesn't have to worry about seed quality.
- At Pioneer, we emphasize that, quality is everybody's job. **Quality Assurance** supports all employees in their efforts to produce a quality product. Care must be taken in production to balance capacity and quality.
- High quantity production is a short term measure of success, while quality production is a long term measure of success for the entire company.

Quality Standards/Criteria Format

1. **Seed lot philosophy** - explain how lots are established and what can constitute a lot
2. **Warm test** - label germ on record
3. **Vigor test**- in-house use only
4. **Seed field inspection** - isolation, detasseling, shredders, off-types, cultural problems
5. **Seed moisture** - acceptable range; after drying, for bulk storage, for conditioned product
6. **Seed size** – seeds/lb, rounds in flats etc.
7. **Plantability** - acceptable range
8. **Quality counts** - monitor conditioning
9. **Treatment** - pesticide and colorant coverage
10. **Unit weight** – accurate
11. **Bag checks** - look at seed and package from customer's perspective
12. **Discard** - below quality

Mission Statement and Functions/Activities

- *Quality Assurance's mission is to provide service and support for Production, Sales and Marketing to assure high quality products.*
- The following is one example of a Mission Statement and some of the functions/activities for a Quality Assurance program:

Functions/ Activities

A. Coordinate communications, exchange of quality information and provide technical services and support to Production Operations, Sales, Marketing, Overseas Operations and Plant Breeding.

1. Preliminary preconditioning samples
2. Conditioning instructions
3. Rework instructions
4. Seed lot quality decisions
 - a. Conditioning plants responsible for seed appearance
 - b. Quality Assurance labs run quality tests
5. Seed plant inspections
6. Customer complaints
7. Certification - work with state agencies
8. Seed law compliance

9. Overseas quality and conditioning

10. Trouble shoot

11. Conditioning workshops

- a. Equipment operation
- b. Equipment evaluation
- c. Procedures

12. Promote innovation and proactive decision making in seed quality

13. Communications with Sales

- a. Production/quality presentations
- b. Current quality status/decisions
- c. Effects of packaging changes, etc.
- d. Planter clinics
- e. Support for product complaints

B. Manage Seed Quality Labs to be timely, consistent, reliable and reputable

1. Proper sampling
2. Germination testing with proper technique - warm test, vigor test
3. Electrophoresis testing with proper technique
4. Plantability testing
5. Other tests - waxy, mechanical damage, TZ, AAetc.

C. Provide documentation in the form of reports, manuals and quality standards/criteria

1. Quality/production manuals, forms
2. Quality standards/criteria
3. Coordinate annual production report

D. Maintain Plant Breeding's genetic potential and participate in transforming that potential into a superior product by demonstrating and encouraging a commitment to quality.

1.Corn seed field inspection; work with soybean, wheat, sorghum, sunflower seed field inspection.

2.Agronomics as it relates to quality

a.IPM

b.Seed handling

c.Genotype X environment - expression of seed quality

d.Drying

e.Work with Plant Breeders, Parent Seed and Production Research

E. Continue development and utilization of computer information data base to assure accurate data and optimum quality seed.

1. Historic conditioning data

- a) Size-out/clean-out
- b) Germination
- c) Purity
- d) Units

Sequence of Functions/Activities

Up to this point the discussion has centered around the ideal theoretical organization of a Quality Assurance Group. Where the work is "really" done is in the technical and day to day operation of quality assurance. A fully integrated quality assurance program may proceed sequentially, as in the following example in respect to some of the more routine activities.

A. Planting

1. Grower selection - top-notch cooperative growers
2. Hybrid/variety placement - area of adaptation, yield
3. Isolation - set standards, meet requirements
4. Plant population - yield, seed size
5. Timing (nick) -yield, purity

B. Cultural

1. Integrated pest management - yield, quality
 - a. Weed control
 - b. Insect control
 - c. Disease control

C. Pollination

1. Roguing - remove off-types
2. Detasseling - seed purity
3. Inspection- purity, standards met

D. Harvest

1. Proper timing- harvest moisture, quality, yield
2. Proper equipment operation and cleaning -
mechanical damage and purity
3. Proper drying and aeration - germination, molds, storability
4. Proper handling - mechanical damage

E. Preliminary samples

1. Supply estimate - number of units to sell
2. Quality assessment- proactive conditioning decisions based on quality results
3. Conditioning instructions - to get proper supply and high quality

F. Conditioning

1. Proper screens, equipment - select for supply and quality
2. Quality checks and counts -monitor quality
3. "Think" like a customer- seed appearance
4. Right amount, right product, right place, right time - total supply management
5. Treatment- proper amount and color
6. Bagging - proper packaging, appearance and weight
7. Tagging - satisfy labeling laws
8. Proper sampling- obtain representative sample

G. Quality testing

1. Physical purity - foreign material, inert, weeds, etc.
2. Physical quality- appearance
3. Seed size- proper size for plantability, and unit weight
4. Plantability- within standards
5. Warm test- using approved methods
6. Vigor test- in-house standards must be met
7. Genetic purity - electrophoresis evaluation
8. Approval for shipment- OK lots for shipment to customers
9. Grow out - check questionable lots
10. Emergence trials - correlate with vigor testing
11. Other tests -waxy, accelerated aging, TZ, fast green, etc.

H. Carryover

1. Proper sampling - correct number of bags probed to obtain random representative sample
2. Germination - warm test and vigor test
3. Rework instructions - supply and quality approval

What is Seed Village

- A village, wherein trained group of farmers are involved in production of seeds of various crops and cater to the needs of themselves, fellow farmers of the village and farmers of neighbouring villages in appropriate time and at affordable cost is called "a seed village".



Concept of Seed Village

- Organizing seed production in cluster (or) compact area
- Replacing existing local varieties with new high yielding varieties.
- Increasing the seed production
- To meet the local demand, timely supply and reasonable cost
- Self sufficiency and self reliance of the village
- Increasing the seed replacement rate

Features

- Seed is available at the door steps of farms at an appropriate time
- Seed availability at affordable cost even lesser than market price
- Increased confidence among the farmers about the quality because of known source of production
- Producer and consumer are mutually benefited
- Facilitates fast spread of new cultivars of different kinds

Establishment of Seed Village

The present programme of seed village scheme is having two phases

- I. Seed production of different crops
- II. Establishing seed processing unit

I. Seed production of different crops

- Seed village concept is to promote the quality seed production of foundation and certified seed classes.
- The area which is suitable for raising a particular crop will be selected, and raised with single variety of a kind.

Selection of area

The area with the following facilities will be selected.

1. Irrigation facilities
2. Suitability of climatic conditions to raise the crop for more than one season
3. Labour availability and Knowledge of local farmers on that particular crop
4. Occurrence or out break of pest and diseases
5. Past history of the area for suitability to raise seed crop
6. Average rainfall and distribution
7. Closeness to a urban area for easy movement of seed and other inputs

Seed Supply

- Suitable area for seed production will be identified by the Scientists.
- The foundation/ certified seeds or University labeled seeds will be supplied by the University through Krishi Vigyan Kendras (KVKs) and Research Stations at 50% subsidy cost to the identified farmers in the area.
- The farmers will use these quality seeds and take up their own seed production in a small area (1 acre) for their own use.
- The crops are Rice, Pulses and Oilseeds.

Capacity building

- In order to harness the synergy between technologies and the community participation, special emphasis is being given to build farmer's capacity to produce quality seeds.
- A training on seed production and seed technology to the identified farmers for the seed crops grown in the seed villages will be given for technology empowerment of farmers.

Training to the farmers

- First one day training : At the time of sowing, training on: Isolation distance, sowing practices, seed treatment and other agronomic practices.
- Second one day training: During flowering, training on: Identifying off types and removal, maintenance of seed plots, plant protection measures, maturity status and harvesting methods.
- Third one day training: After harvest, training on: Seed cleaning, grading, seed treating, bagging and storage aspects, seed sampling and sending to seed testing laboratory for analysis.
- A seed grower forum will be organized for further empowerment of technology and marketing



Training at the time of sowing



Training at the time of flowering



Training at the time of harvesting



II. Establishing seed processing unit

- Post-harvest seed handling is a vital component of the total technology in marketing available good quality seeds of improved varieties.
- If the seeds are not processed and handled properly, all the past efforts in production may be lost.
- Thus seed processing and packaging is very important aspect in seed production.
- The location of seed processing centres is based on the available infrastructure and convenience.
- Such a place will be well connected with roads and transportation facilities.
- Each seed processing centre will have the following



Infrastructure need for seed processing unit

- ✓ Seed garden cum clearer
- ✓ Bag closer, trolleys, scales and furniture Building to house equipment
- ✓ Seed storage structure
- ✓ Seed threshing and drying yard Information centre



Seed garden cum cleaner



Trolley



Bag closer

Seed storage structures



Mud bin structure



Purl type structure

Steel storage

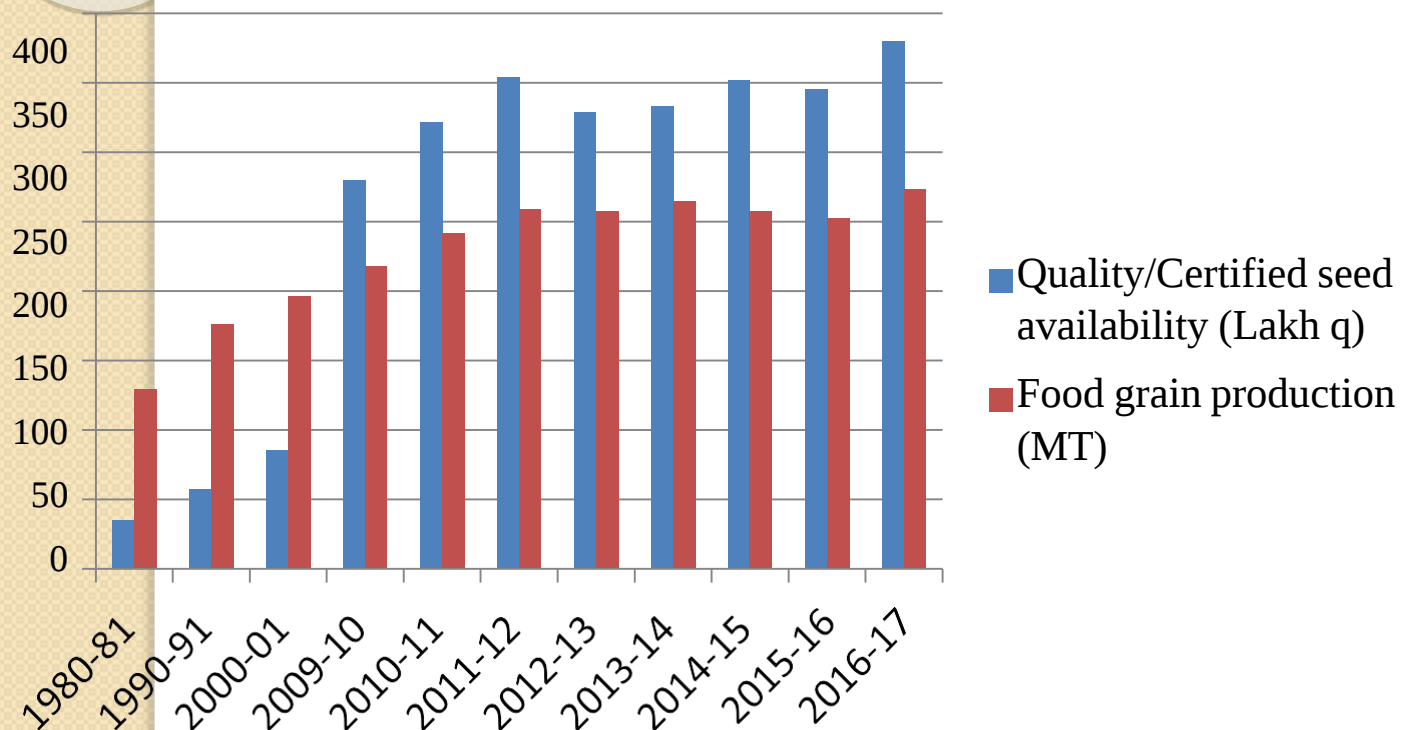


Advantages

1. Solve the problem of isolation. Mainly in cross pollinated crops like maize, sunflower where it required more Isolation distance the problem will be solved by raising a single variety in a large area.
2. Mechanization is possible from sowing to harvesting.
3. Post harvest handling of seed is easy.
4. Because of a single variety, the problem of varietal admixture during processing, drying will be avoided
5. Increased food security.
5. Seedcertification official will cover large area per unittime
6. Totally it reduces the cost ofcultivation
7. Seedwill be with high genetic, physicalpurity

..... there is a strong co-relation between quality seed availability and yield per se

Food Security v/s Seed Security

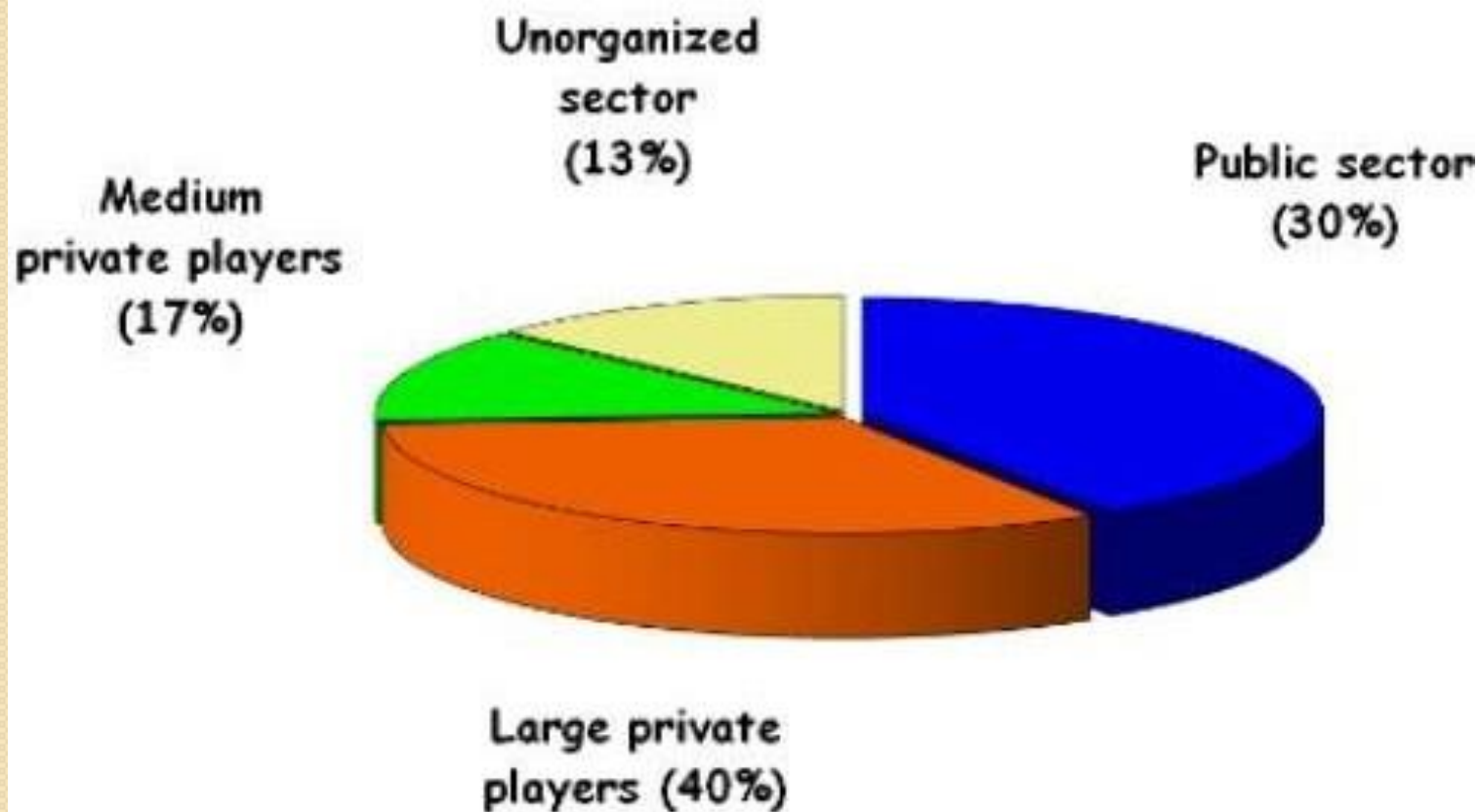


Per Seed More Yield

Present Scenario of Seed Industry/Strength

- **Total Market Size (Million INR) : 150,000**
- **Market Size of PSUs (Million INR) : 45,000**
- **Market Size of Pvt. Companies : 105,000 (Million INR)**
- **Number of PSUs including SSCs. : 17**
- **Number of Pvt. Companies : About 500**
- **AICRPs - released 8187 varieties and hybrids in different crops**
- **Strong research base and network of public and private stake holders**
- **Plant Genetic Resources (PGR) for trait development**
- **Well established seed regulatory and legislative frame work**
- **Seed quality assurance: 22 Seed Certification Agencies and 126 notified seed testing laboratories**

Indian Seed Industry



PRIVATE SECTOR



Organized seed production and supply system operating in India

Seed Supply System in India



Agencies: NSC, SFCI, Private Seed Companies, Cooperatives etc

Distributors: Cooperatives, NSC etc

*Directorate of Seed Research, Mau- Coordination Unit for Breeder Seed Production



STAKEHOLDERS

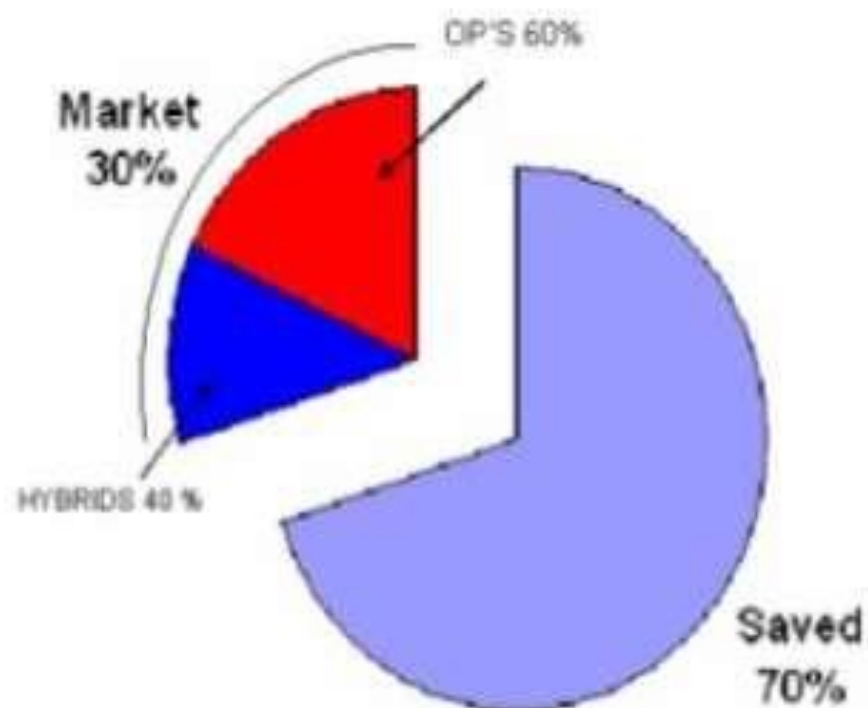


Vegetable Seed Market in India



- Okra is the largest crop in hybrid segment - 2000 MT followed by radish, onion and sweet corn
- At present, the total vegetable seed market is Rs.4000 Cr (\$580 million)
- The largest vegetable growing area –WB, followed by UP, Bihar, MP and Gujarat
- By value, Solanaceaeous crops (Mostly F_1 have largest market share of 19%, Cucurbits have 17% and Malvaceaeous crops have 16%
- **Market share:**
 - Okra-13%
 - Roots & Bulbs -9%
 - Brassicas -8%,
 - Pea & Bean (Both OP's) and Sweet Corn (F_1) hybrid - 24%
 - leafy vegetables -2%
 - Others – 5%

Indian Seed Market



Thank You