MINUTES OF THE MEETING OF THE
S-9 TECHNICAL ADVISORY COMMITTEE
FOR
PLANT GENETIC RESOURCES CONSERVATION AND UTILIZATION
S-9 MULTISTATE RESEARCH PROJECT

A Cooperative Research Project Among:

THE STATE AGRICULTURAL EXPERIMENT STATIONS

OF THE SOUTHERN REGION

and the

U.S. DEPARTMENT OF AGRICULTURE AGENCIES:

AGRICULTURAL RESEARCH SERVICE

COOPERATIVE STATE RESEARCH, EDUCATION AND EXTENSION SERVICE

NATURAL RESOURCES CONSERVATION SERVICE

AUGUST 6, 2003

UNIVERSITY OF GEORGIA

COLLEGE OF AGRICULTURE AND ENVIRONMENTAL SCIENCES

GRIFFIN CAMPUS-GEORGIA EXPERIMENT STATION

GRIFFIN, GEORGIA

SUBMITTED BY

THOMAS W. ZIMMERMAN, CHAIRPERSON

Adopted Agenda:

Wednesday, August 6

8:00 am	Introduction by Dr. Arkin, Administrative Advisor. Dr. Zimmerman, Committee Chair.
8:45 am	Remarks by attendees representing NPGS.
9:15 am	Summary and comments regarding the previous year by Dr. Pederson, RL.
10:10 am	Break
10:30 am	Introduction and overview presentation of grass curation project by Dr. Melanie Newman.
10:45 am	Introduction and overview presentation of genetics project by Dr. Ming Li Wang.
11:00 am	Discussion regarding curation activities among committee members only.
12:00 am	Lunch at Western Sizzler.
1:30 pm	Continue discussions by committee members only.
3:00 pm	Break
3:20 pm	Tour seed room and GRIN by Merrelyn Spinks.
3:35 pm	Tour new farm building at Westbrook if completed by Jim Strickland.
3:50 pm	Tour cold frames by Clarence Lee and Gus Taylor.
4:00 pm	One on one meetings if needed.
4:30 pm	S9 business meeting of TAC member at large conference room in Redding. Upon completion of the business meeting, this will conclude the official S9 meeting.
7:00 pm	Dinner at Southern Pit barbeque restaurant or on your own if some committee members wish.

Thursday, August 7

8:00 am	Optional discussions and individual tours if needed or wanted by those interested in staying overnight.

Attendees:
TAC Members:

Thomas Zimmerman, Chair	University of the Virgin Islands, VI.
Gerald F. Arkin, Administrative Advisor	University of Georgia, GA
Fred Allen	University of Tennessee, TN
Kenton Dashiell	Oklahoma State University, OK
Don LaBonte	Louisiana State University, LA
Mari Marutani	University of Guam, GU
Jorge Mosjidis	Auburn University, AL
Ken Quesenberry	University of Florida, FL
Emerson Shipe	Clemson University, SC
H. Thomas Stalker	North Carolina State University, NC

Griffin PGRCU Staff:
Gary Pederson, Research Leader & Curator Annual Clovers, USDA, ARS
Rob Dean, Geneticist, University of Georgia
Graves Gillaspie, Research Plant Pathologist/Vigna Curator, USDA, ARS
Melanie Newman, Agronomist & Grasses Curator, USDA, ARS
Ming Li Wang, Research Molecular Geneticist, USDA, ARS
Bob Jarret, Research Horticulturist/Sweetpotato & Vegetable Crops Curator, USDA, ARS
Brad Morris, Agronomist, Misc. Legumes & New Crops Curator, USDA, ARS
Roy Pittman, Agronomist, Peanut Curator, USDA, ARS,
Jim Strickland, Farm Manager, USDA, ARS
Donnie Hice, Agricultural Research Assistant, Field Services
Libbie Lancaster, USDA, ARS
Phiffie Vankus, USDA, ARS
Jill Cunningham, USDA, ARS
Sarah Moon, USDA, ARS
David Pinnow, USDA, ARS
Meredith Reed, USDA, ARS
Greg Waits, USDA, ARS

Other Attendees:
Peter Bretting, USDA-ARS National Program Leader for Germplasm
Mike Owsley, USDA-NRCS Americus, GA
Donald Surrency, USDA-NRCS Athens, GA
Paul Raymer, UGA, Griffin, GA

1. Call to Order

The Regional S-9 Technical Advisory Committee (TAC) was called to order at 8:10 AM on Monday, August 7, 2000 by chairperson Thomas Zimmerman in the Redding building conference room on the Griffin Campus of the University of Georgia, College of Agriculture & Environmental Sciences, Griffin, Georgia.

2. Welcome and Opening Remarks

Dr. Gerald Arkin in his welcome talked about the importance of germplasm and the vital role of the S-9 Project on this matter. Dr. Arkin discussed the impact of budget cuts that are affecting universities and other agencies on the work that can be done. Although budget reductions are not affecting S-9, the cooperating state universities in the region are being severely affected. He emphasized that the S-9 project is entrusted by the community to protect our germplasm and that the results obtained from the work done need to be important, meaningful, despite any budget reductions. He reported that there is strong support from the SES directors for the S-9 project despite budget reductions. He pointed out the importance of bringing industry representatives to participate in the S-9 TAC meetings. Dr. Arkin thanked those attending the meeting for their participation and encouraged those not present to attend. He also commented on the absence of Dr. Ann Marie Thro and on the need for her to come.

3. Roll Call

Some representatives from the federal government were not present

4. National Overview

Dr. Peter Bretting presented the National Program Staff Report with the activities at the national level (Appendix 1). He highlighted the importance of partnership of the program with state universities. Dr. Bretting pointed out that all imported plant material needs to have a phytosanitary certificate because rules and regulations are being strictly enforced. He indicated that local collections maintained by state scientists that retire need to be reported to NPGS so that the government can make a decision about bringing it into the system.

5. PGRCU Overview

Dr. Gary Pederson gave a presentation (Appendix 2) of the activities and improvements of the unit in the past year. He pointed out that the sorghum collection had been actively increased and seed germination tests were increased substantially. The collection is in good shape and the unit is in good relations with the respective CGC. Dr. Pederson finished by presenting statistics on the number of reports received by the unit describing performance of plant introductions in relation to the number of shipment of samples. The ratio is below 5% and he plans on taking measures to increase this percentage. T. Stalker recommended that a herbarium collection of the material in the grass collection be made. The committee commented on the positive leadership and noticeable improvements to the unit during Dr. Pederson's tenure as research leader.

6. Grass Curation

Dr. Melanie Newman presented an overview of her project (Appendix 3). She is focusing on regeneration of accessions with low number of seeds available but have enough seeds to repeat increases if conditions are not adequate for seed germination. Dr. Newman is also working on developing descriptors which presently are few for these species. It was discussed that greenhouse collection of clonally maintained material needs to be evaluated for ability to produce seed. The cost of greenhouse maintenance of these clones is very high.

5. Overview of Genetics Project

Dr. Ming Li Wang will focus on germplasm characterization using genotyping with a variety of DNA markers such as RAPDS, AFLPs, AP-PCR, SSRs, and SNPs. He will also determine secondary metabolites using HPLC. More detail information on his project can be found in Appendix 4.

6. Committee Members Discussions

The S-9 Technical Advisory Committee (TAC) reconvened after the lunch break at 1:20 p.m. by chairperson. Dr. Thomas Zimmerman. Discussion focused on suggestions that could help the unit and the whole system make an even more efficient use of the resources available. One suggestion was to plant two species that do not intercross in the same cage when increasing seed. Another was to reduce long-term maintenance costs by reducing the number of accessions in the greenhouse. It was also discussed that it was important that Dr. Wang concentrate his efforts on the usage of DNA markers and have another person specialize on the HPLC. It was emphasized the need to make herbarium specimens of the grasses because the specimens could be sent to botanical gardens for identification.

It was suggested to contact Plant Material Centers of NRCS to find collections that could be kept on a long term basis by NPGS. It was further discussed that the peanut curator needs to be proactive in getting the wild peanut collection from Texas. Because Dr. Pittman cannot identify peanut species, it is important that he makes a photographic documentation or prepares a herbarium specimen of the collection. It was recommended that all curators contact researchers to get data from evaluations of accessions.

The status of the new S-9 proposal that was written for a 10 year period was also discussed. The proposal was completed and internally and externally reviewed. It was approved by the reviewers with high marks and received minor corrections. It presently awaits the southern directors to approve it. A few states have not completed and/or submitted the forms stating the name of their representative to the project and outlining the amount of time they would be spending on this project. The project can be seen by logging in to the national database at: http://www.lgu.umd.edu/showInfo.cfm?trackID=4275. Also, individual termination reports need to be submitted during this year by each state representative to conclude the present S-9 in effect until Sept. 30, 2003.

Yearly reports from the S-9 TAC were distributed. State representatives were encouraged to

complete one if they hadn't done so. Each report should include yearly activities, impact and publication.

7. Business meeting

K. Quesenberry moved to approve the minutes and F. Allen seconded. Fred Allen was elected secretary and Jorge Mosjidis chair of the S-9 TAC. The location for next meeting was discussed. K. Quesenberry offered to host it in Gainesville, Florida, on August 3-4**,** 2004 and F. Allen seconded. The new location was approved by acclamation. Meeting was adjourned at 4 pm. TAC members toured the new seed processing room and cold frames.

Appendix 1

DR. PETER BRETTING

NATIONAL PROGRAM STAFF REPORT

2003 NATIONAL PROGRAM STAFF REPORT

FOR THE U. S. NATIONAL PLANT GERMPLASM SYSTEM
NATIONAL PROGRAM STAFF, NATIONAL PROGRAM 301: PLANT, MICROBIAL, AND INSECT GENETIC RESOURCES, GENOMICS, AND GENETIC IMPROVEMENT
(PETER BRETTING, EVERT BYINGTON; SCOTT CAMERON, LELAND ELLIS, JOHN RADIN, ERIC ROSENQUIST, KAY SIMMONS, RICH WILSON, ADA JUDY ST. JOHN)

1 Personnel changes

1.1 Welcome to new scientists Nahla Bassil (Corvallis), Ming Li Wang and Melanie Newman (Griffin), Tracie Matsumoto and Lisa Keith (Hilo). Congratulations to John Bamberg (academic promotion), Kim Hummer, Jana Love, Jim Mowder, Gerald Seiler, David Spooner, and Francis Zee for their promotions. Congratulations to Chuck Simon, who will move from the USDA/ARS Davis site to assume the RL position at USDA/ARS NERPIS in Geneva, NY.

1.2 Farewell and best wishes to Mark Hopkins (Griffin) and Judy Flynn (Corvallis).

1.3 Robert Hanneman, long-time ARS researcher who focused on potato genetics and genetic enhancement, recently passed away after a long battle with cancer.

2 Site changes

2.1 The Sturgeon Bay/Madison site completed "backing-up" all its accessions in -20C storage.

2.2 The Griffin site completely renovated its seed handling facility, and constructed a new machine shed for farm equipment.

2.3 The Aberdeen small grains site completed digital imaging of the inflorescence and kernel morphology of ca. 35,000 accessions.

2.4 The Corvallis clonal germplasm site received numerous grants and special allocations that will strengthen its scientific program and infrastructure.

2.5 The College Station cotton site received more than 160 accessions from Uzbekhistan as a continuation of the germplasm exchange program arranged by curator Ed Percival and others.

2.6 The Hilo site leased 100 acres from the County of Hawai'i, 50 at 800' above sealevel, and 50 at 2,500.' This land may provide badly needed access to tropical "microclimates" needed to regenerate certain NPGS low-latitude samples.

2.7 Budget increases during recent fiscal years enabled various sites to upgrade facilities, purchase needed equipment, and hire technical and support staff. All the preceding has expanded tangibly the NPGS operational capabilities.

3 Budgets

3.1 Despite recent increases, the budgets of some NPGS sites are still strained at present. Continual increases in labor and operating costs may further reduce their effective operating budgets in the future.

3.2 FY03. Again, the ASTA-initiated effort to increase the NPGS budget was highly successful. A broad-based coalition of supporters actively advocated this action.

The FY03 agriculture appropriations bill included a ca. $1.75 million increase, so that the NPGS budget is currently $40.5 million. This increase is certainly welcome.

3.3 FY04 and beyond? The Administration's FY04 budget would reduce the NPGS's budget by recent Congressional increases ("add-ons") but, at the same time, would increase the NPGS's budget by $4 million. The FY04 House "mark-up" of the Administration's budget includes an increase specified for maize germplasm; the Senate "mark-up" does not. As in other years, differences in the two Congressional budgets must be reconciled in the Conference Committee, which will probably not occur until after Labor Day 2003, or perhaps even later. With the post-9/11 increased costs for national defense, recent wars in Iraq and Afghanistan, homeland security, the tax cuts, the large increase in crop subsidies authorized by the 2002 Farm Bill, the economic slowdown, and increased budget deficits, the future status of USDA/ARS budgets is uncertain. "Discretionary dollars" (includes USDA/ARS's budget) may be squeezed particularly hard, especially in FY04 and later budgets.

4 National Programs:

Starting in 1997, ARS reorganized its total research portfolio into a series of 22 national programs. Plant, microbial, and beneficial insect genetic resource management, genetic improvement, genomics, bioinformatics, and genomic database management were incorporated into National Program 301 (see the WWW at: http://www.nps.ars.usda.gov/programs/programs.htm?NPNUMBER=301).

4.1 Following the April 2000 NP301 workshop, three writing teams composed of ARS scientists drafted an Action Plan to guide ARS scientists in choosing objectives for research projects under NP 301. The Action Plan is on the web at http://www.nps.ars.usda.gov/programs/programs.htm?npnumber=301&docid=1013 and continues to evolve.

4.2 In late 2002 and early 2003, 106 NP 301 CRIS projects were subjected to mandatory peer review overseen by the USDA/ARS Office of Scientific Quality Review (OSQR). An additional 30+ projects will be reviewed in spring, 2004. Details of this process are found at the web site http://osqr.ars.usda.gov/panelpres This National Program review is a response to Public Law 105-85 requiring that ARS projects be reviewed by panels composed primarily of non-ARS scientists.

4.3 The reviews examined the following aspects of ARS CRIS projects: 1) are the objectives appropriate for the NP with which the project is associated? 2) are the best scientific and technical approaches employed? 3) is attaining the objectives feasible?

4.4 NP301 is a large national program, and required ten separate review panels. 82% of the NP301 projects scored "moderate revision" or better ("passing"), and 18% "major revision" or worse, with one "infeasible." These percentages closely resembled the averages for all National Programs reviewed to date.

4.5 Again, 30+ NP 301 projects will be reviewed in 2004, and we continue to need a large pool of qualified reviewers. If you are asked to serve as a reviewer, please

do so, or communicate names of superior reviewers directly to OSQR at the preceding web site.

5 International germplasm items:
Negotiations on the Revision of the International Undertaking on Plant Genetic Resources for Food and Agriculture concluded in November 2001, with 113 nations adopting the text of the International Treaty (IT) for Plant Genetic Resources for Food and Agriculture. The US and Japan voted as "abstaining," thereby neither adopting the text, nor blocking the consensus to do so. See http://www.iisd.ca/linkages/biodiv/iu-wg/ or http://www.fao.org/biodiversity/IPGR_en.asp for details.

Despite its abstention from voting for the IT text, the US on 1 Nov. 2002 signed the IT, joining more than seventy other nations which have already done so. Signing the IT was strongly supported by the US agricultural community, who wanted to enable the US to participate actively in developing the standard material transfer agreement (MTA) for plant genetic resource exchange. On 9-11 October 2002, the FAO Commission on Genetic Resources for Food and Agriculture, serving as the interim Governing Body for the IT, began to define the process for developing the MTA, and addressed other details of treaty implementation. These negotiations continue, with the first meeting of the MTA expert group occurring at FAO perhaps in autumn 2003.

Concurrently with these developments, the Convention on Biodiversity (CBD) adopted the voluntary, non-binding Bonn Guidelines on Access and Benefit-Sharing during the sixth Conference of Parties (COP-6) of the CBD at The Hague in April 2002. For details see: http://www.biodiv.org/meetings/cop-06.asp or http://www.iisd.ca/linkages/vol09/enb09239e.html An Ad Hoc Technical Experts' Group will convene for its second meeting in December 2003 to develop definitions of key terms, and deliberate other issues associated with the Bonn Guidelines. This meeting follows the World Summit on Sustainable Development, in Johannesburg during the summer of 2002, which supported an effort by "biodiversity-rich nations" (led by Mexico) to establish a separate international regime for benefit-sharing, under the auspices of the CBD.

The preceding developments at FAO and with the CBD will substantially affect international exchange of plant genetic resources, and the NPGS, whether or not the U. S. is ultimately a Party to either or both treaties. Precisely how they will affect U. S. users of germplasm is unclear at present, but during 2003-2004 some of the most important questions bearing on these issues may be resolved.

6 Visiting foreign scientists

6.1 ARS scientists can again sponsor visa applications for visiting foreign scientists. According to Mike Ruff, Director of ARS Office of Homeland Security, one must submit an ARS Form 230, and have the application cleared via a Name Trace Request by CIIFA (CounterIntelligence Field Activity). For questions, confer

with your Area Office, or contact the ARS Office of Homeland Security at 202.720.2452.

7 OIG audit of NPGS sites:
In May 2002, the USDA Office of Inspector General decided to conduct an audit of most NPGS sites. The OIG audit focuses on 1) how NPGS sites manage genetically-engineered plants; 2) physical security at NPGS sites. It started in August 2002, and recently concluded. The final audit report is not yet complete, but it will likely stress the need for consistent, documented, systematic "internal controls" for germplasm, and enhanced physcial security measures.

Appendix 2

DR. GARY PEDERSON

PLANT GENETIC RESOURCES: CURRENT STATUS

Plant Genetic Resources: Current Status

Gary A. Pederson

USDA, ARS, Plant Genetic Resources Conservation Unit

Griffin, GA

Outline

- PGRCU mission
- Current status of each crop
- Progress made
  - Project plans
  - Security assessments
  - Funding
  - Staffing
  - Equipment
- Data submission by users
  - ASA 2003 presentation

Acknowledgement

- Merrelyn Spinks and Lee Ann Chalkley, Plant Genetic Resources Conservation Unit, compiled and summarized all numbers shown in this presentation.

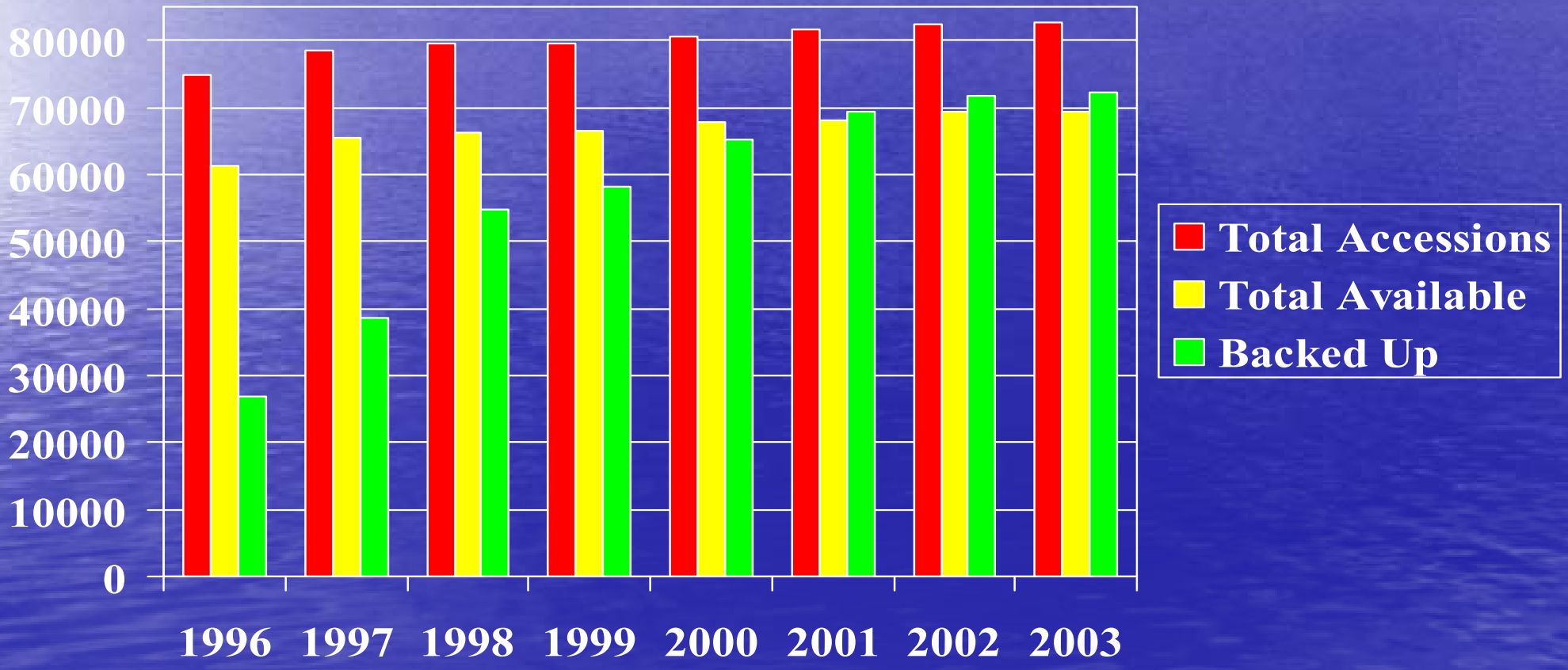
What is the mission of PGRCU?

- Plant Genetic Resources Conservation Unit (PGRCU) exists to conserve plant genetic resources for users today and for future generations.
- Mission statement: "acquire, characterize, maintain, evaluate, document, and distribute plant genetic resources".
- This is what users of the genetic resources maintained at Griffin expect from the Unit.

PGRCU Collection - June 2003

- Total Accessions
  - 82,584
- Total Available
  - 69,470 (84.1%)
- Backed Up
  - 72,257 (87.5%)

PGRCU Collection 1996 - 2003



Vigna

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2002
Graves Gillaspie	Cowpea	8,033	5,535	5,982	1,435
	Mung bean	4,196	3,833	4,095	37
	Other Vigna spp.	600	265	298	61

Vegetable Crops & Sweetpotato

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2002
Bob Jarret	Cucurbits	2,029	918	1,320	144
	Eggplant	969	892	923	298
	Okra	3,000	1,535	1,919	76
	Peppers	3,912	3,775	3,837	4,708
	Sweetpotato - tissue culture	730	693	268	727
	Other Ipomoea spp.	410	131	158	300
	Watermelon	1,645	1,613	1,634	801

Legumes and Misc. Crops

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2002
Brad Morris	Castor bean	373	270	357	78
	Kenaf & Roselle	338	292	309	239
	Legumes	3,504	2,655	2,736	516
	Miscellaneous	136	100	121	217
	Sesame	1,203	1,195	1,203	1,249

Warm-Season Grasses

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2002
Melanie Newman	Bamboo	98	98	50	33
	Grasses	6,667	5,860	5,966	305
	Pearl millet	1,081	1,048	1,064	18

Clover and Sorghum

CLOVER CURATOR/ SORGHUM COORDINATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2002
Gary Pederson	Annual Clover	2,111	1,442	1,507	513
	Sorghum	31,700	28,853	30,010	17,058

Peanuts

CURATOR	CROP	TOTAL ACCESSIONS	TOTAL AVAILABLE	NUMBER BACKED UP	ITEMS SHIPPED IN 2002
Roy Pittman	Cultivated Peanuts	9,092	7,846	8,300	413
	Wild Peanuts	757	621	200	99

Collection of Arachis spp. in Paraguay

Collected 27 wild peanut and 2 cultivated peanut accessions in June 2003

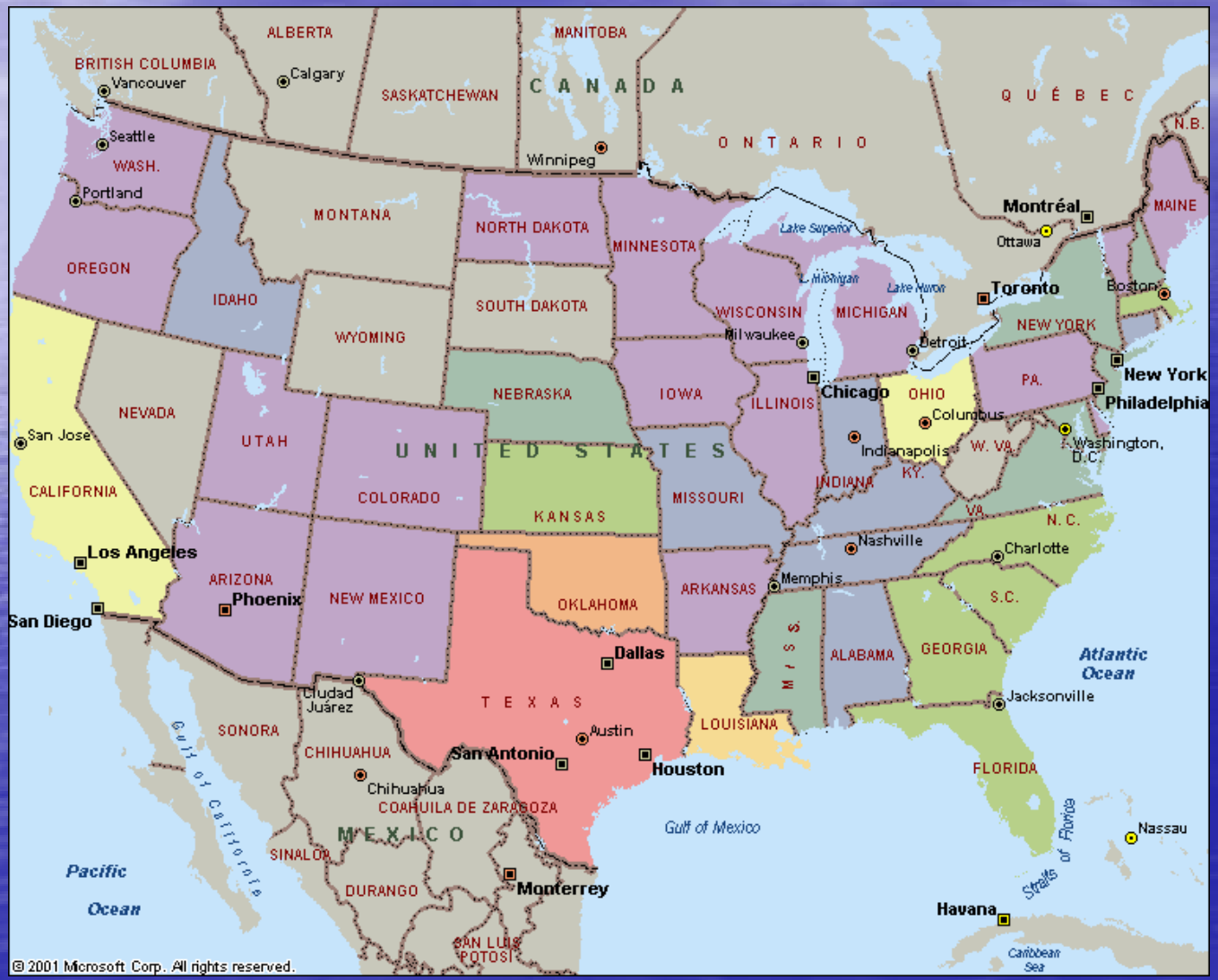
Requested for regeneration in CY2002

Crop	# accessions	Crop	# accessions
Cowpea	258	Castor bean	36
Sorghum	1,992	Grasses	34
Cucurbit	51	Kenaf	29
Clovers	197	Legumes	341
Ipomoea sp.	40	Misc. crops	14
Okra	10	Sesame	8
Peppers	76	Cult peanut	846
Watermelon	150	Wild peanut	14

Distributions in CY2002

- Domestic = 26,548 items in 535 orders
  - S-9 region = 20,650 items
- Foreign = 2,777 items in 162 orders
- Total CY2002 distributions = 29,325 items

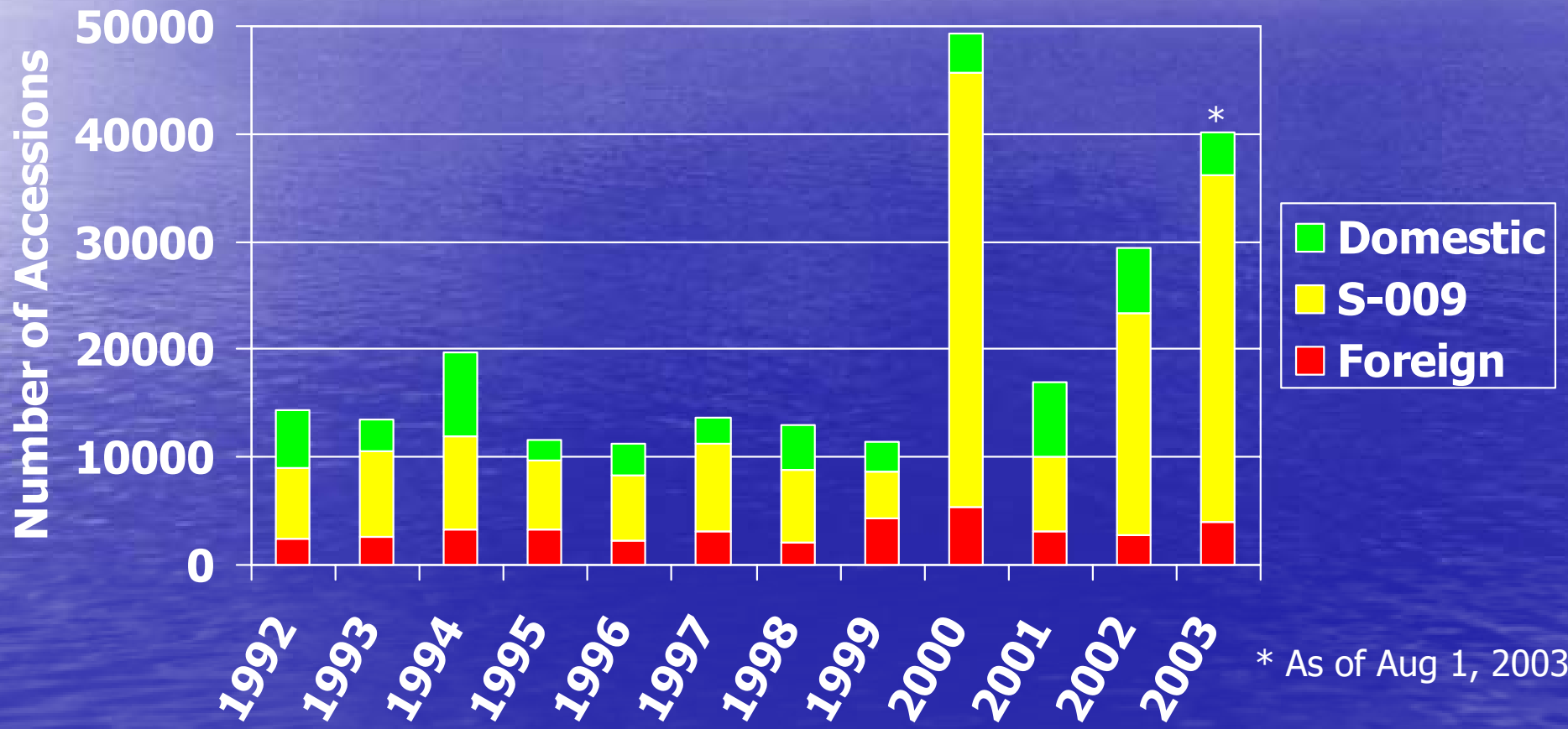
Domestic Distributions in CY2002



Totals by State

- 7,500 to 9,999
- 5,000 to 7,499
- 2,500 to 4,999
- 1,000 to 2,499
- 500 to 999
- 100 to 499
- 50 to 99
- 1 to 49

Distributions to S-9 Region



* As of Aug 1, 2003

Foreign Distributions in CY2002

Argentina	Costa Rica	India	Philippines	Spain
Australia	Czech Republic	Italy	Puerto Rico	St. Croix
Austria	Ecuador	Japan	Senegal	Sweden
Brazil	Egypt	Malaysia	South Africa	Thailand
Cambodia	Finland	Netherlands	South Korea	Trinidad and Tobago
Canada	France	Paraguay	South Korea	United Kingdom
China	Germany			

Progress Made

- Project plans
- Security assessments
- Funding
- Staffing
- Equipment

Project Plans in 2003

- ARS Project Plan – NP 301 (5 years)
  - seven reviewers rated 6.6 (0-8 scale)
  - minor revision
  - ARS mean score=4.6 NP 301 mean=4.9
- S-009 Project (10 years)
  - four reviewers rated five categories (20 ratings)
  - 18 “Excellent” and 2 “Good”
  - minor revision

Security Reviews in 2003

- OIG Audit
  - mainly looked at how to handle GMO accessions (we don't have any).
- USDA "Tiger Team" (OPPM)
  - Complete security evaluation
  - many security improvements suggested that are being implemented

PGRCU Funding

- ARS base funding increases:
  - FY2001 = $349,370
  - FY2002 = $225,000
- ARS temporary funding increases:
  - FY2003 = $45,000 (moveable shelves in freezer)
  - FY2003 = $57,000 (HPLC)

Total PGRCU Funding

- ARS base funding:
  - FY2003 = $2,141,903
- S-9 base funding:
  - FY2003 = $395,643

Staffing - S-9

- S-9 positions filled in last year
  - Jill Cunningham (Farm crew – weekend waterer)
  - Kenneth Turner (Farm crew - Byron)
- Eight permanent S-9 employees
- 10-13 temporary full-time and part-time positions will be filled during FY2004 to handle specific labor needs. Replacing federal STEP students hired in FY2003.

Staffing - ARS

- ARS positions filled in last year
  - Noelle Barkley (Mol lab support scientist – starts end of Nov)
  - Steven Bishop (Seed storage tech)
  - Melanie Newman (Agronomist – Grass curator)
  - Meredith Reed (Mol lab tech)
  - Gus Taylor (Misc legume tech)
  - Greg Waits (Vegetable tech)
  - Ming Li Wang (Research Geneticist)

Staffing - ARS

- Currently have 3-4 ARS positions to fill
  - Administrative Technician
    - Interviews shortly
  - Secretary (tentative)
  - Computational Biologist (Cat. 4 scientist)
  - Biol Sci Tech (Peanut tech)
- Supervisor training
  - Seven supervisors took "Introduction to Supervision" course in FY03

Staffing summary

- Current staff is 34 employees (26 ARS and 8 S-9)
- Additional staff includes 10 STEP students
- When vacant positions are filled, the full staff will be 38 employees (30 ARS and 8 S-9)
- *Historical perspective: In Jan. 2001, full staff was ~28 permanent employees (18 ARS and 10 S-9)*

Equipment purchased

- Seed processing
  - All old ductwork removed
  - Six new workstations and storage cabinets
  - New air handling system located outside of the building with moveable ducts over each workstation
  - New air compressor and air hoses located over each workstation
  - New insulated garage door

Improvement of Griffin seed cleaning operations


Old seed cleaning area


New seed cleaning area

Equipment purchased

- Seed storage
  - Replacing metal trays in cold rooms with 4,000 new black plastic trays
  - New moveable storage shelves purchased for freezer (-18 C) cold room *(to be installed in September).*
- Information technology
  - Seven new computers and a Linux server
  - Club car for IT transportation

Equipment purchased

- Field operations
  - New metal machine shed (60’ x 100’) located at Westbrook farm about 1 mile from station *(Sept)*
  - New Gator (Griffin)
  - Chemical spreader
  - Two new cold frames (16’ x 32’)
- Germination/pathology/tissue culture
  - New germination chamber
  - Freeze dryer
  - Growth chamber and tissue culture incubator

Equipment purchased

- Molecular lab
  - Centrifuge
  - Mixer mill to speed DNA extraction
  - Nanopure water system
  - Scientific imaging system for pictures of gels
  - Thermocycler for PCR reactions
  - Gene pulser microbial system to amplify DNA fragments
  - HPLC *(delivered Sept)*

Building Repair

- Replaced shingles on federal headhouse
- Replaced gravel and reseat benches in vegetable greenhouse
- Replace shingles and remove old vents from roof of seed processing building *(August)*
- Replace some greenhouse roof panels *(Sept)*
- Replace greenhouse screens *(Sept)*

Short-term Future Plans

- Emphasis for next year will be on increasing number of regenerations.
- Need to evaluate better ways of conserving soil and reducing erosion in regeneration fields.
- Need to increase the amount of data returned by users for entry into GRIN.

Data Submission by Users of Plant Genetic Resources

Gary A. Pederson

Summary of poster for ASA meeting

Nov. 2003

Denver, CO

Introduction

- Since 1992, PGRCU has distributed over 200,000 accessions to users.
- Some accessions are used for observation and selection, and no specific evaluation data is taken on each accession.
- Complete data in GRIN on all accessions evaluated would be useful to other researchers.
- Users do not always submit their data to GRIN.

Objective

- Compare the number of distributions made to users of Griffin plant genetic resources to the number of these users who submitted their evaluation data to GRIN.

Materials and Methods

- All distributions of <25 accessions were not included.
- All data submitted by curators from observation or regeneration plots were not included.

Results

- Data sets were submitted by users for GRIN entry for <5% of all distributions.

Conclusions

- Curators and seed bank managers must develop improved methods to encourage researchers to submit evaluation data into GRIN.
- How?
  - peer pressure (CGCs, S-9 committee, colleagues)
  - create perceived benefits (technology transfer)
  - persistent requests
  - requirement by funding organization

Plant Genetic Resources Conservation Unit

Appendix 3

DR. MELANIE NEWMAN

CURATION OF THE WARM SEASON GRASS COLLECTION

Curation of the Warm Season Grass Collection

Melanie Newman
Grass Curator

Current Staff for Grass Curation

Libbie Lancaster

Agricultural Research Technician

Current Staff for Grass Curation

Melinda Murray

Summer Student Worker

Immediate Plans for Grass Collection

- Regeneration Plans
- Plans for Greenhouse Collection
- Plans for Bamboo Collection

Regeneration Plans

Complete Cleaning of Seeds From Previous Regenerations

- Currently there are approximately 100 accessions in drying room from 2001 regeneration efforts

- Germination tests will be performed to establish quality of seed as seeds are cleaned

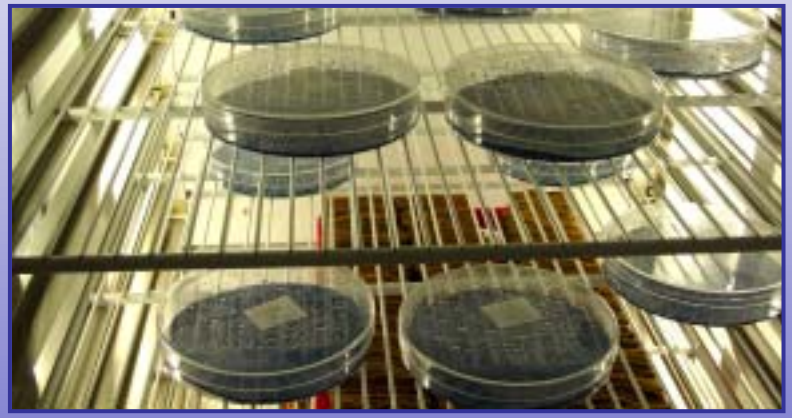
Regeneration 2003

- Accessions were selected that contained 200-500 seeds and were listed as unavailable on GRIN
- A total of 140 accessions requested for regeneration

Handling Difficult to Germinate Accessions

- Accessions with original seed only were sent to Dave and Phiffie for germination and then transplanted to g.h. and then to field

- To date, 65 of the 92 accessions (67%) have been successfully germinated and transplanted to field



Enhance Information Available on GRIN

- Modification of existing descriptors and addition of new descriptors will be explored
- Digital images of each accession will be collected

Plans for the Greenhouse Collection

Current Status of Greenhouse Collection

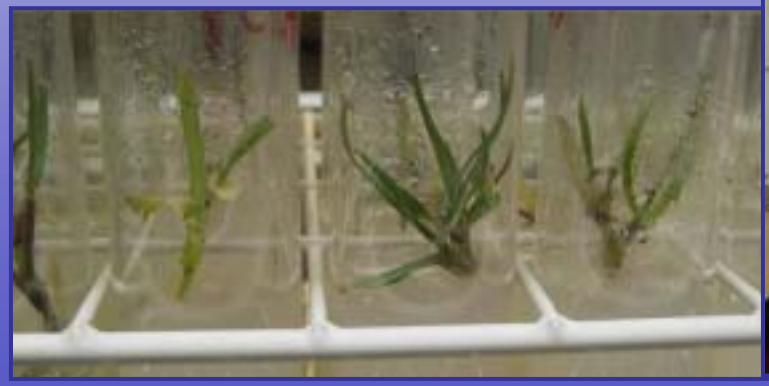
- Total of 398 Accessions
- 21 genera and 42 species represented
- Only one individual plant per accession
- Numerous accessions have been “lost” due to faded or missing labels

Acquire New Accessions

- Recently acquired core collection of *Paspalum vaginatum* from Ronnie Duncan
- Replace “lost” accessions through donations from other collections (eg. *Cynodon* from Wayne Hanna)
- Acquire “core collection” of *Zoysia* from Texas A&M University

Establish in vitro Collection

- Initial cultures will be of *Cynodon*, *Paspalum* and *Zoysia*
- Multiple individuals per accession will be maintained



Plans for the Bamboo Collection

Maintain and Clean Up plots

New Signs for Plot Identification

Overall Results

- Increase the number of accessions available for distribution
- Enhance the descriptor data available on GRIN
- Reduce the labor involved in maintaining and distributing clonal material
- Improve the overall quality of the bamboo collection

Appendix 4

DR. MING LI WANG

IMPLEMENTATION OF MOLECULAR TOOLS FOR GENETIC ANALYSIS AND UTILIZATION OF PLANT GERMPLASM


Welcome to Griffin

Implementation of Molecular Tools for Genetic Analysis and Utilization of Plant Germplasm

Ming Li Wang

S9 Meeting at Griffin, August 6, 2003

Mission of Plant Germplasm Research

- Acquisition
- Preservation
- Characterization
- Evaluation
- Documentation
- Distribution
- Utilization

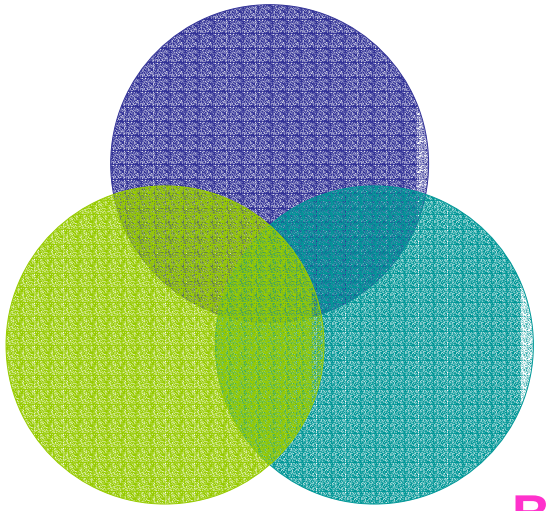
- Maximize genetic diversity
- Less work & long-term storage
- Multiple description
- Identification of uniqueness
- Clearly record all information
- Efficiently meet the requests
- Make good recommendations to customers

What Affects Plant Germplasm Research

- S9 Project Started in 1949
- Computer Technology
- Automation Technology
- Genomics Technology

How to Impact Plant Germplasm Research

Automation
High-throughput

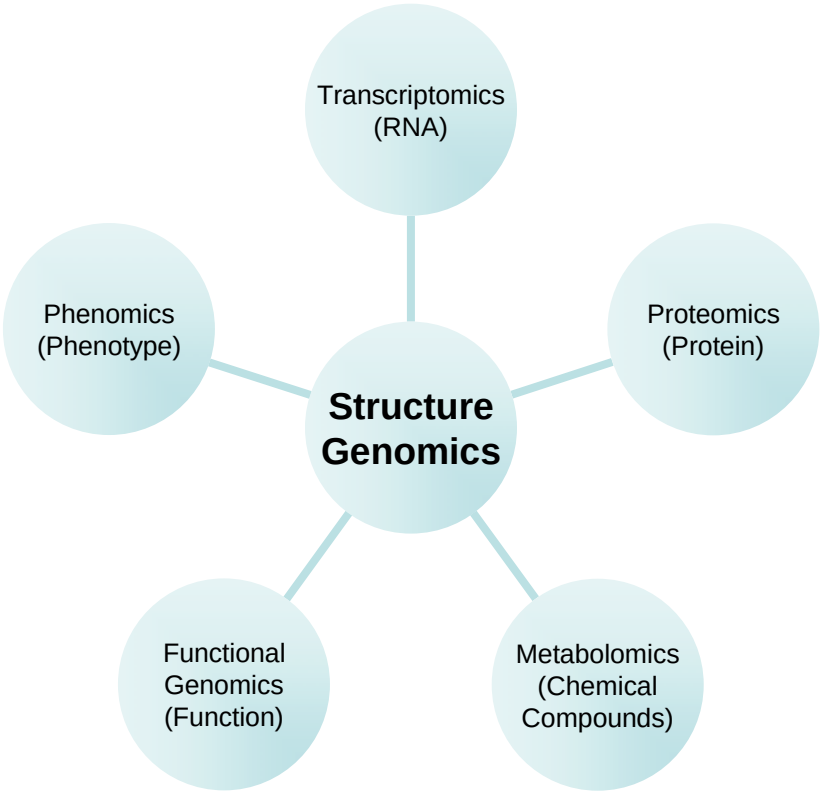


Sequence
Genotype

Computer
Bioinformatics

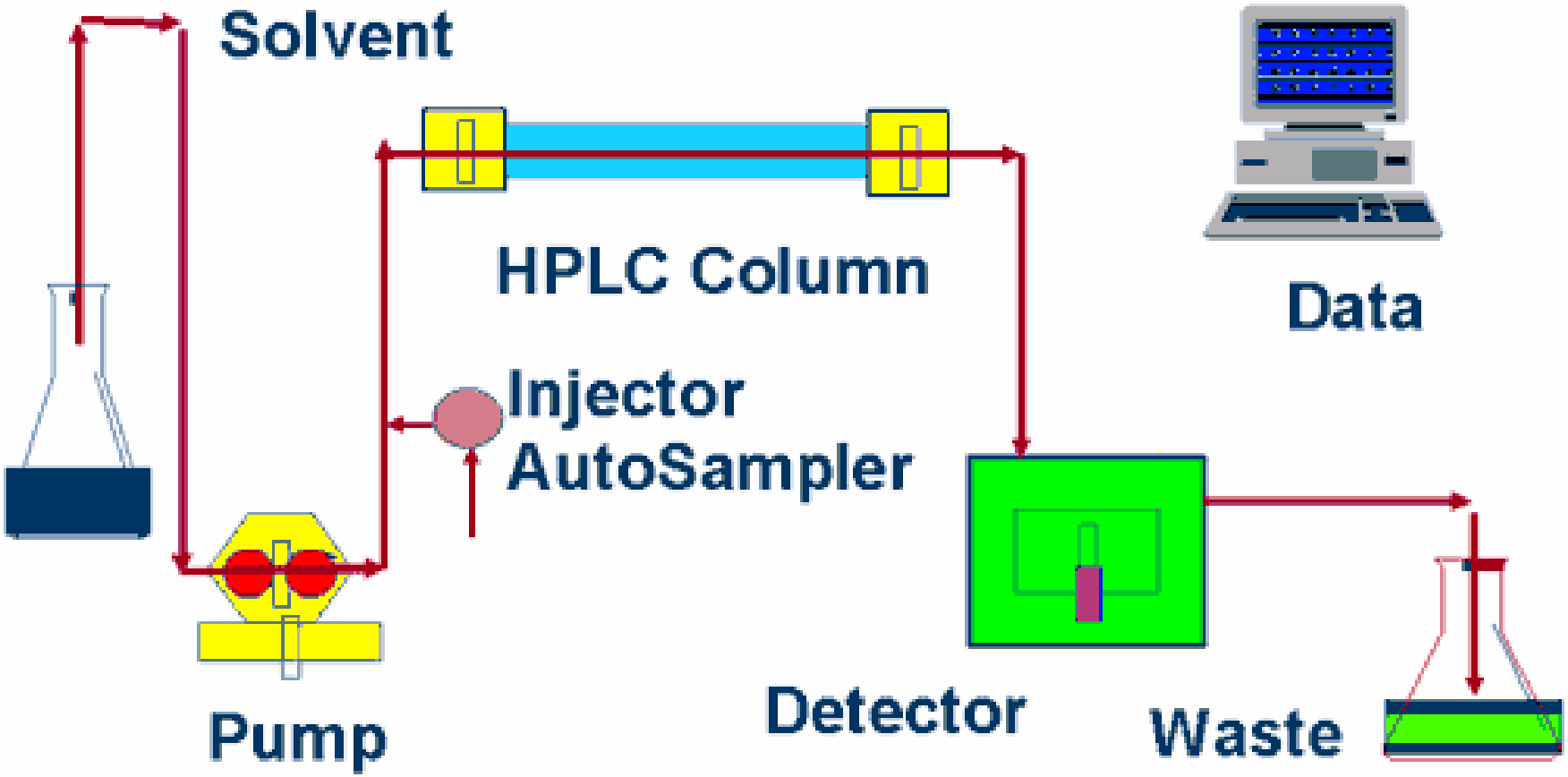
High-throughput genotyping by biomolecule markers

Multiple-omics



Metabolomics: High Performance Liquid Chromatography / MS / NMR
Structural Genomics: Genotyping by TaqMan SNP assay

HPLC System


Solvent
HPLC Column
Data
Injector
AutoSampler
Pump
Detector
Waste

Applications of HPLC System in Plants

- A. Amino acid, proteins and enzymes
- B. Carbohydrates (ß-glucan)
- C. Lipids
- D. Secondary products (flavones)
- E. Growth regulators (jasmonic acid)
- F. Industrially important products (anticarcinogen, antioxidant)
- G. Toxins/Allergens (Aflatoxin)
- H. Pigments (lycopene/carotene)
- I. Vitamins (vitamins A and E, folic acid)

Strategies for Genotyping by TaqMan Assay Depend on Sequence Information Available

- No sequence information available

  Random amplified polymorphic DNA (RAPD)

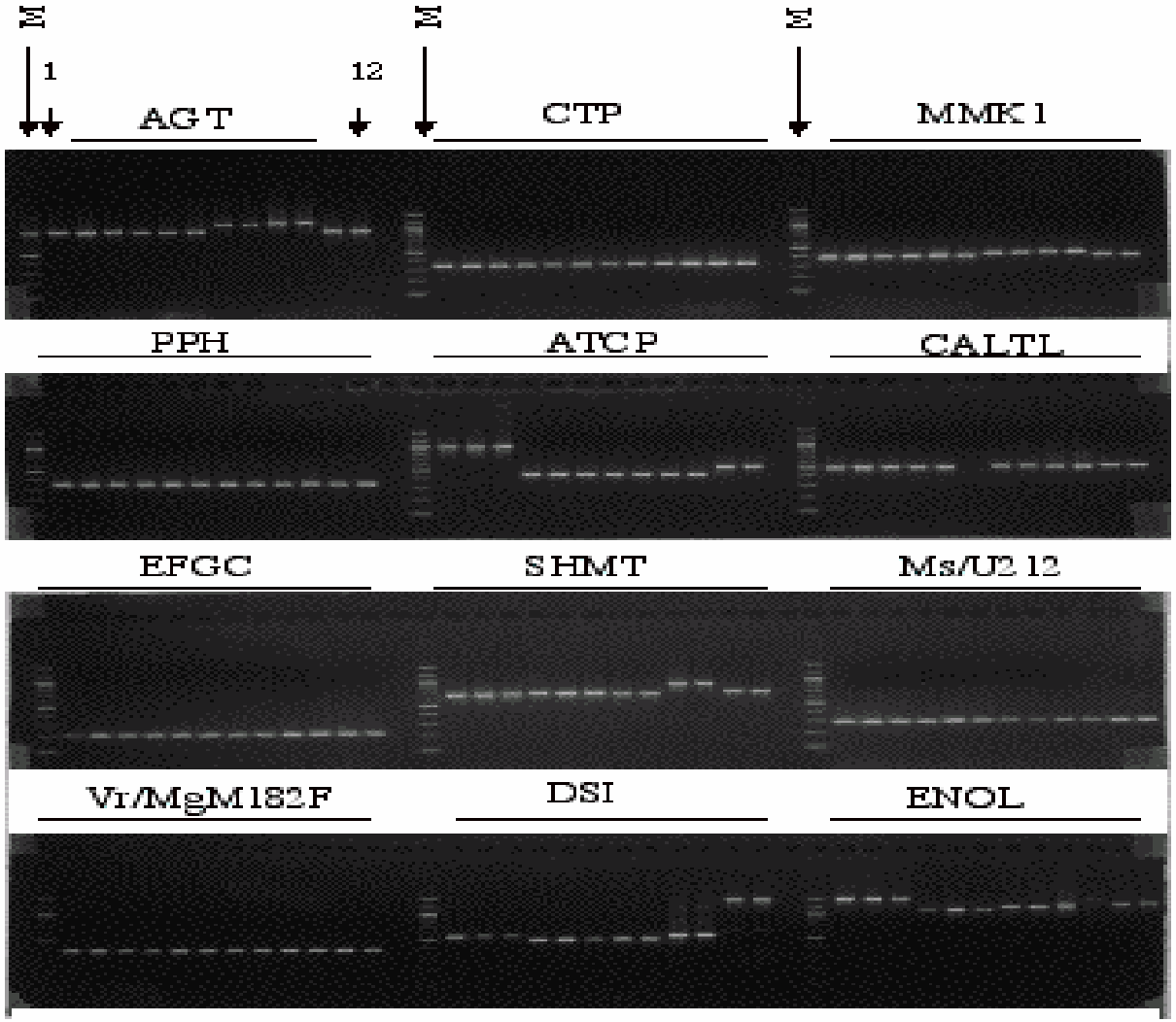
  Amplified fragment length polymorphism (AFLP)

  Arbitrarily primed PCR (AP-PCR)
- Partial sequence information available

  Simple sequence repeats (SSR)
- Complete sequence information available

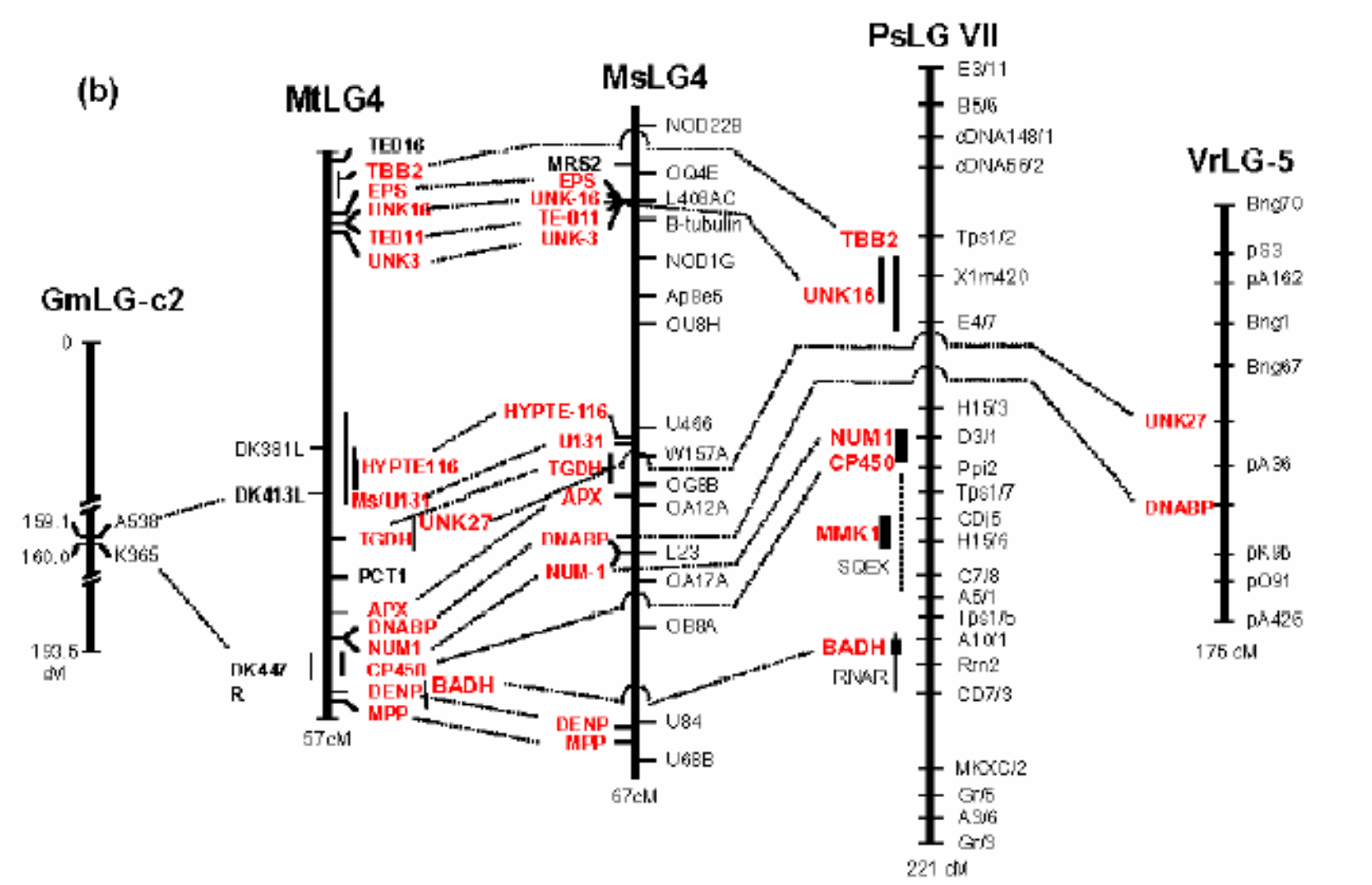
  Single nucleotide polymorphism (SNP)

Challenges and Solutions for Genetic Analysis of Plant Germplasm

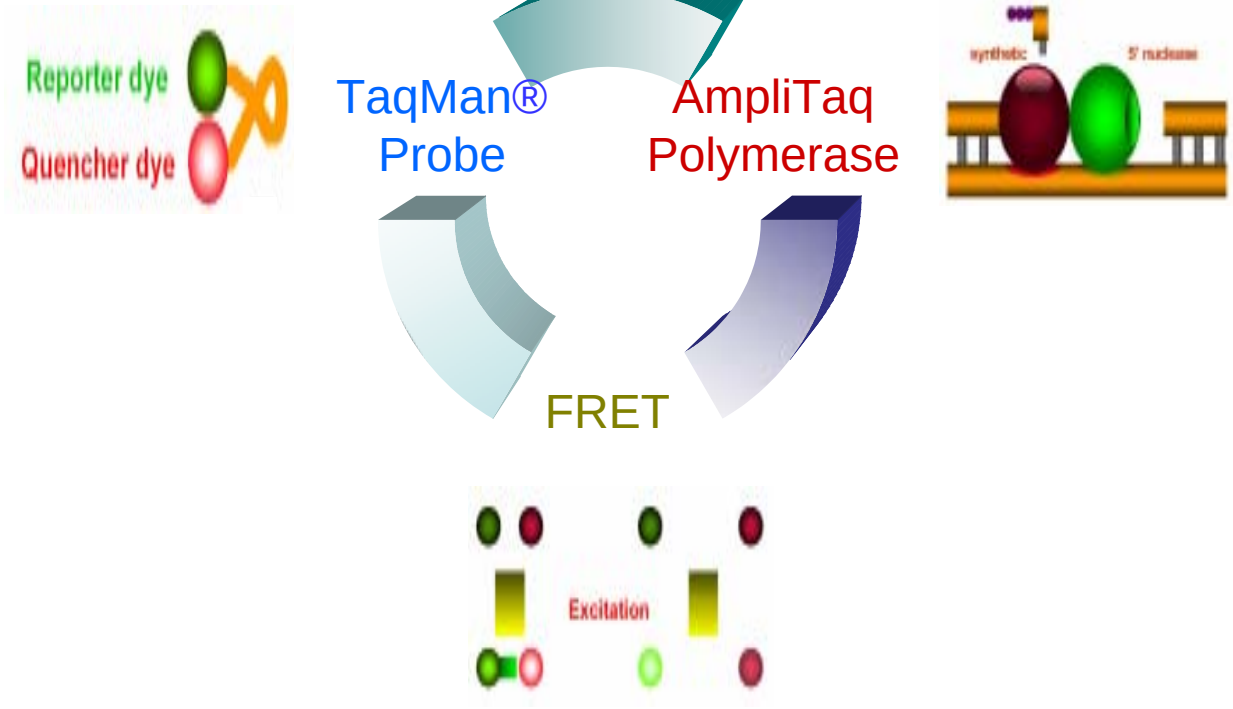


1: Mt A17
2: Mt A20
3: Mt DZA
4: Ps-JI15
5: Ps-JI281
6: Ps-JI399
7: Vr-TC1966
8: Vr-VC3890
9: Gm-PI1209332
10: Gm-Evans
11: Lj-Fili
12: Lj-Gifu

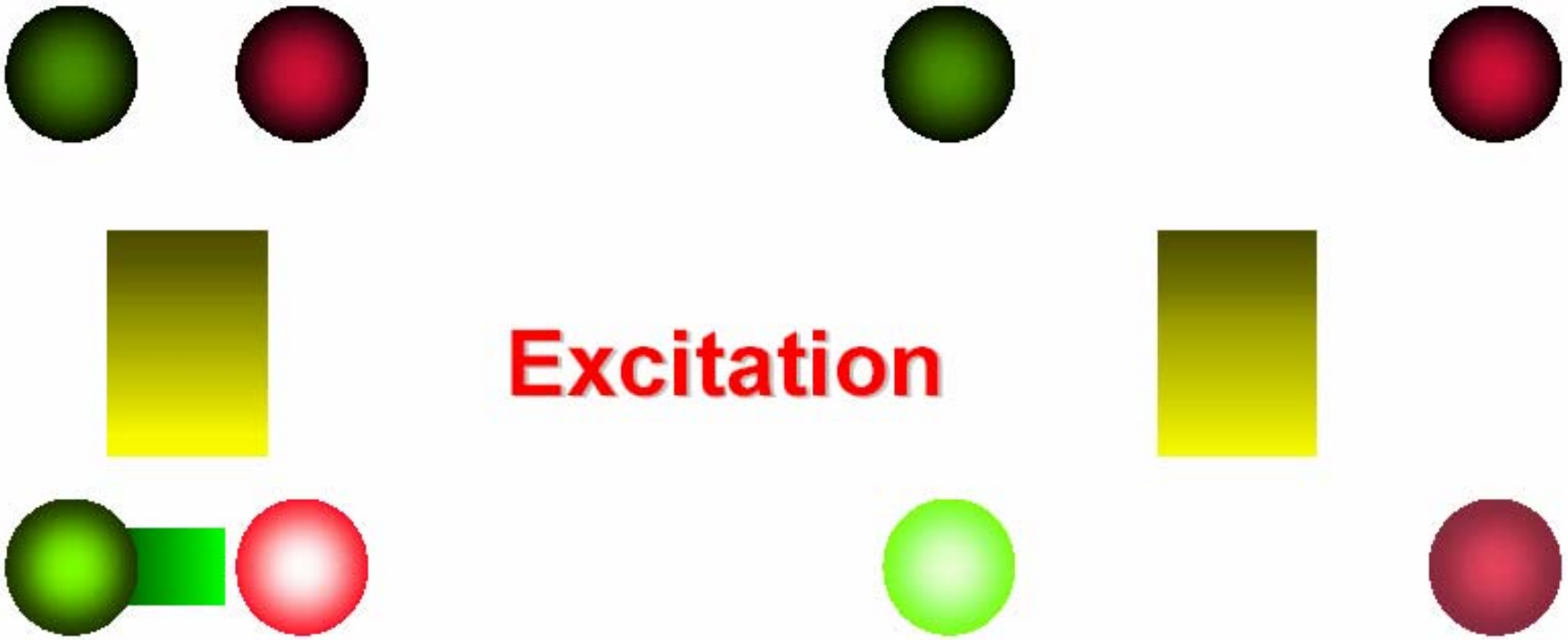
Macrosynteny



TaqMan® Technology



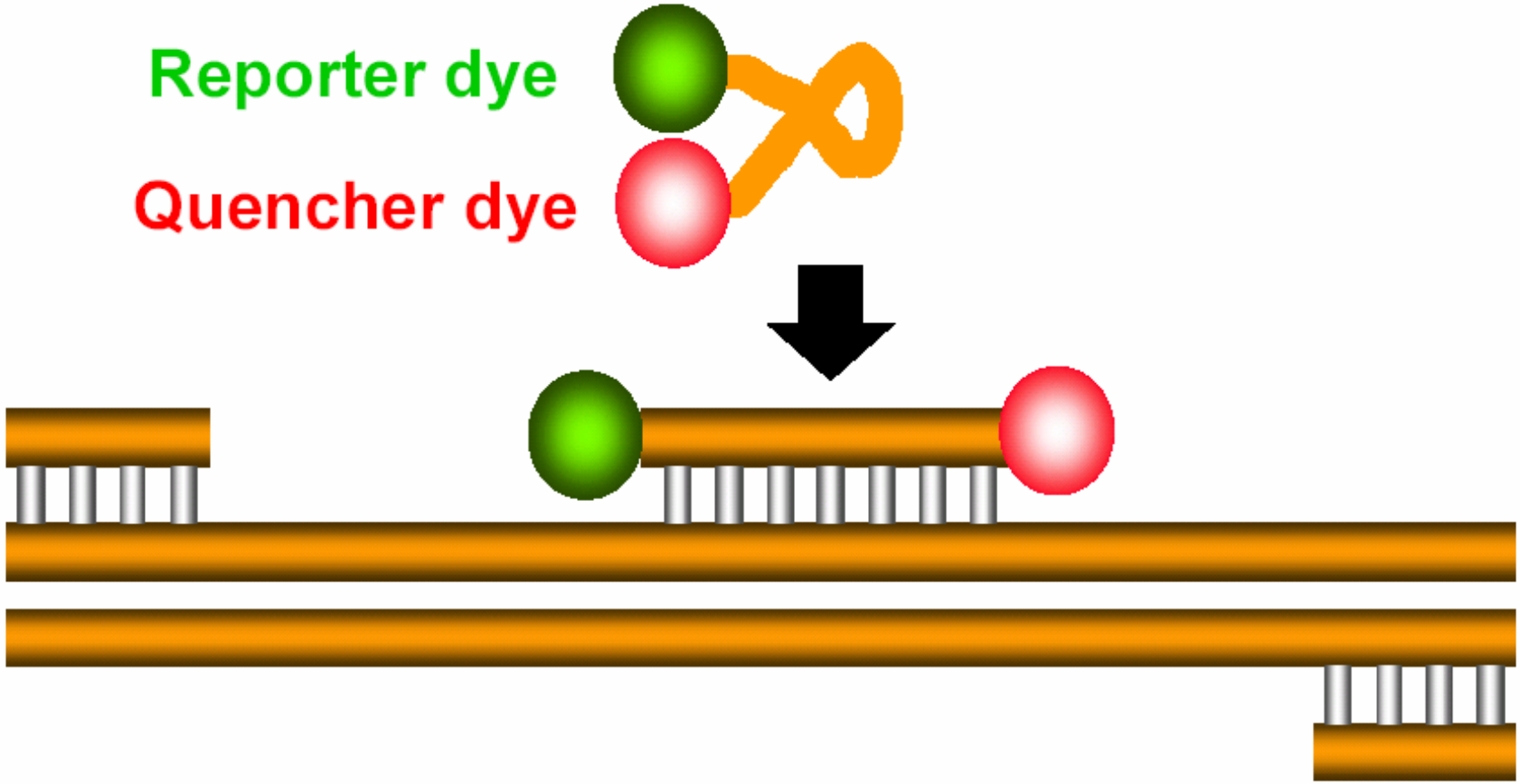
Free Resonance Energy Transfer (FRET)



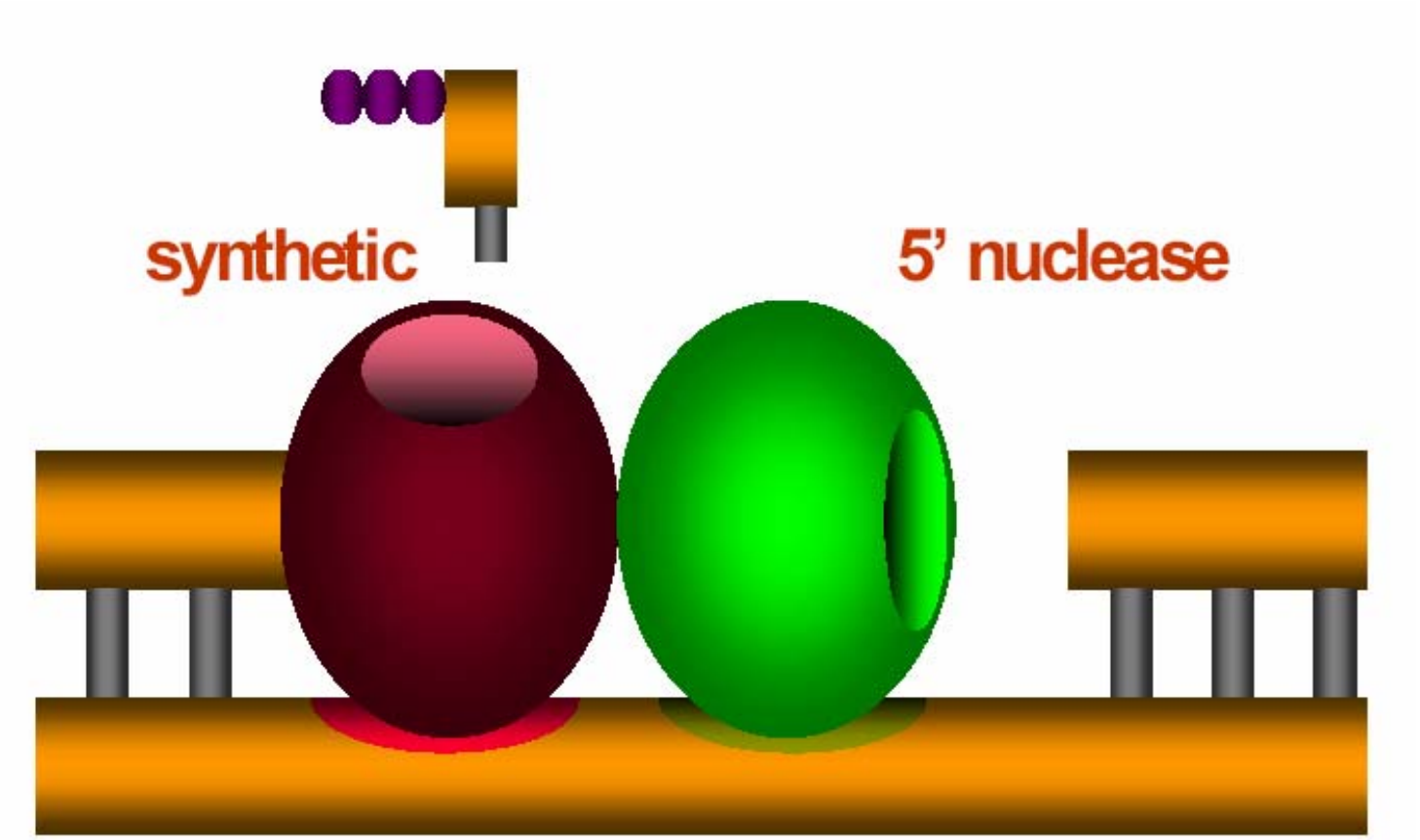
Green signal low

Green signal high

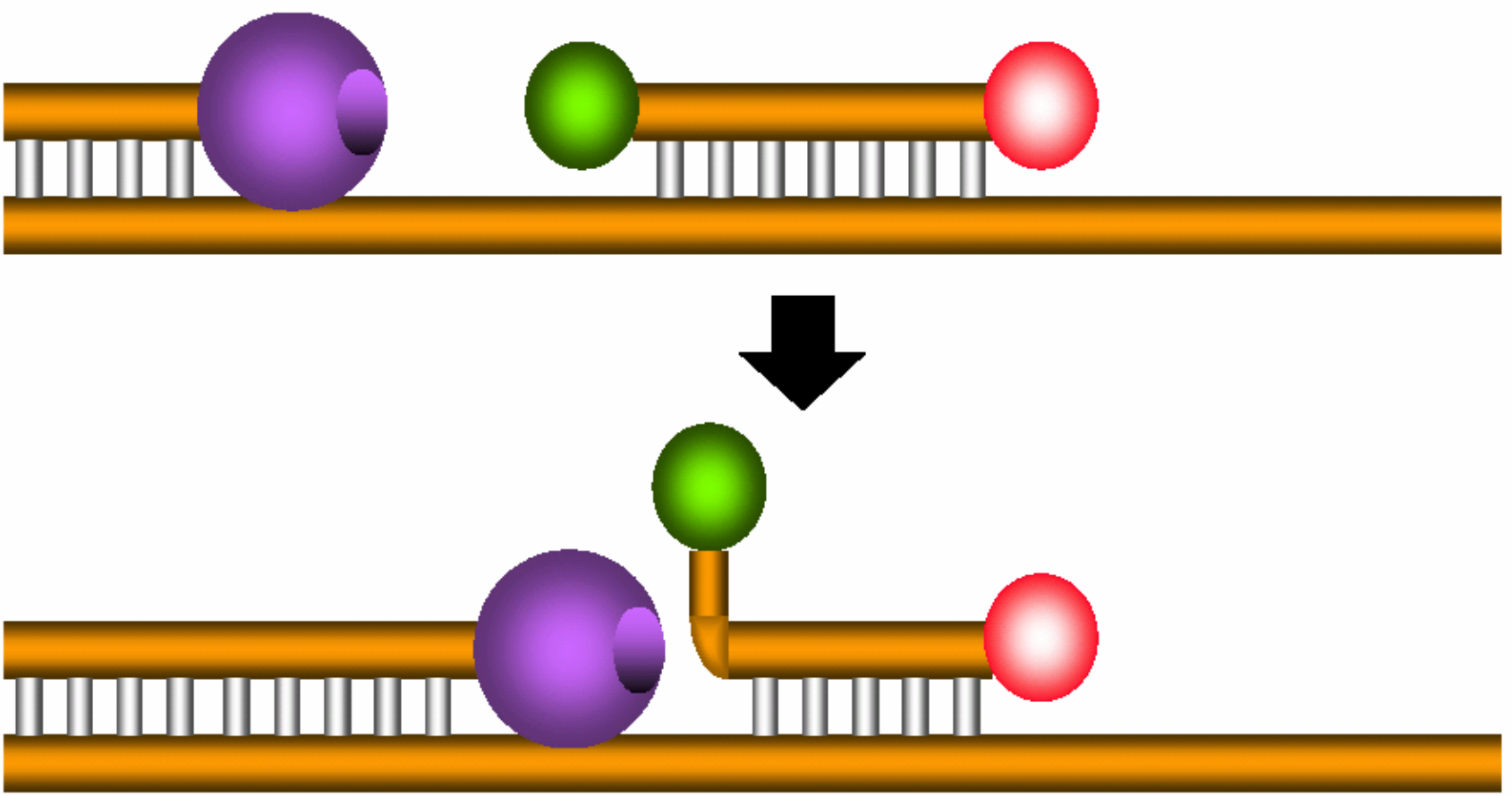
TaqMan® Probe Binds to a Single-Strand DNA



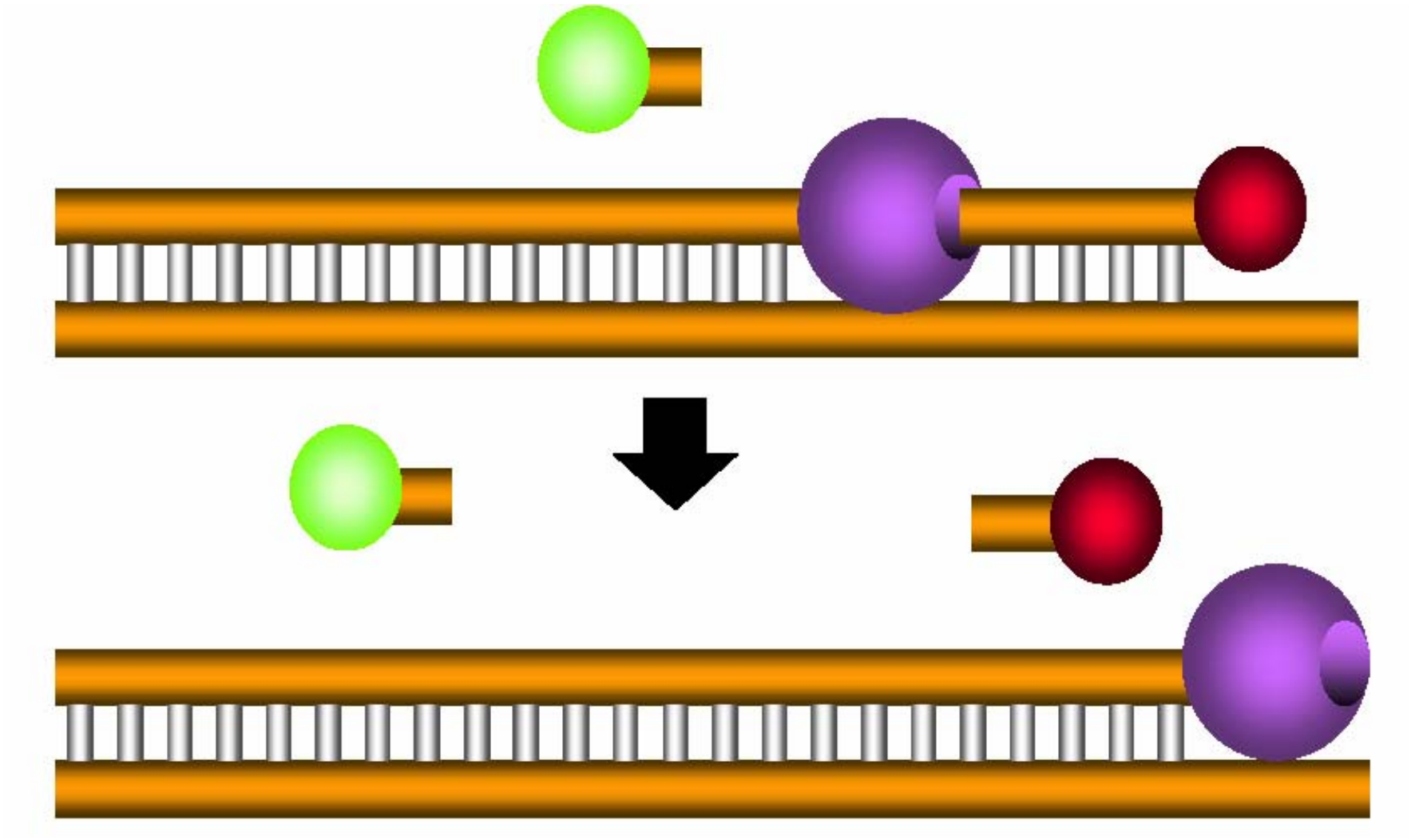
Taq Polymerase Activity



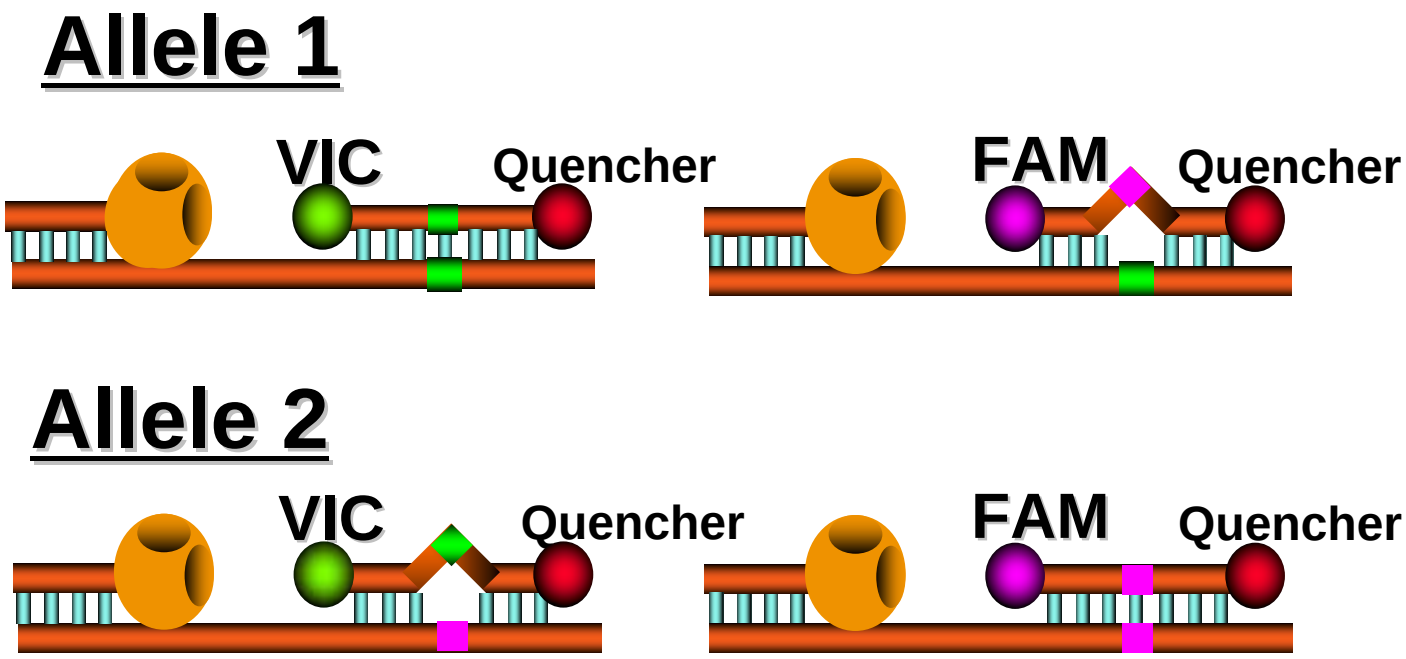
Polymerase Collides With TaqMan® Probe



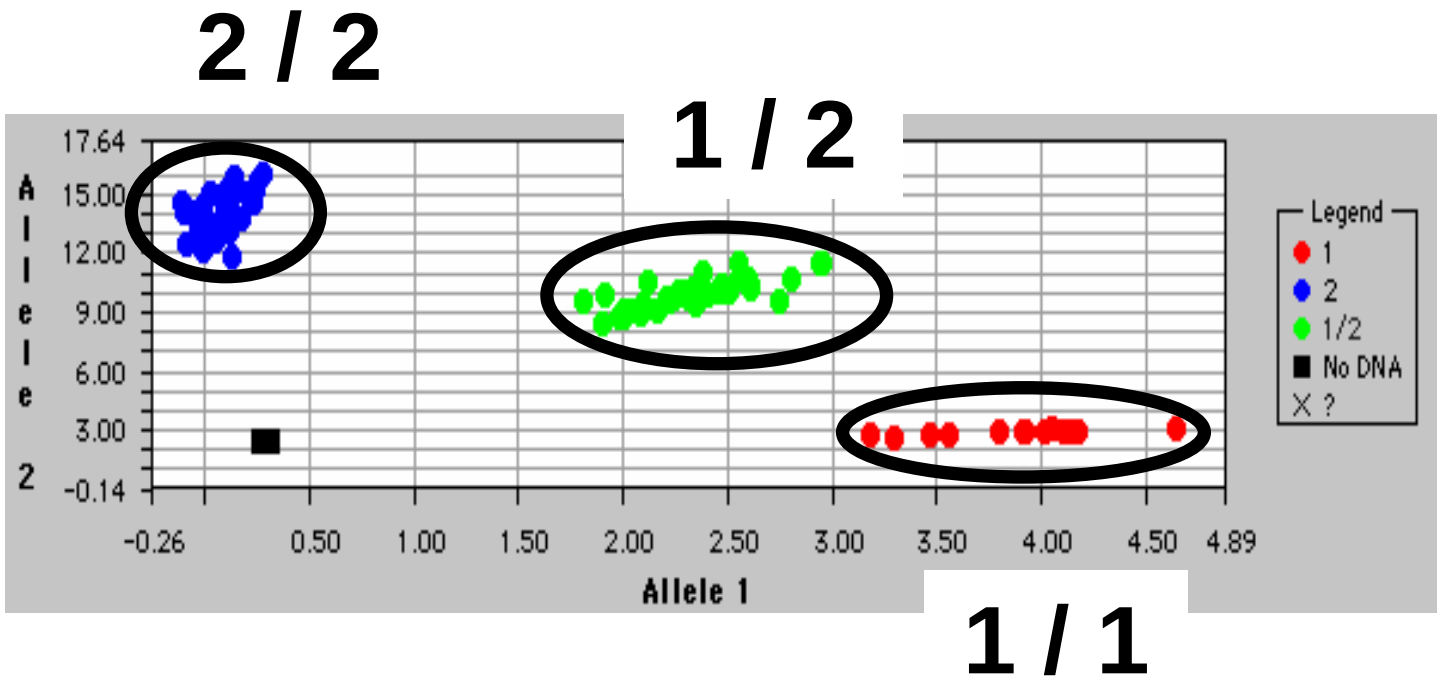
Cleavage of the TaqMan® Probe



Genotyping by TaqMan SNP Assay



TaqMan SNP Assay Results

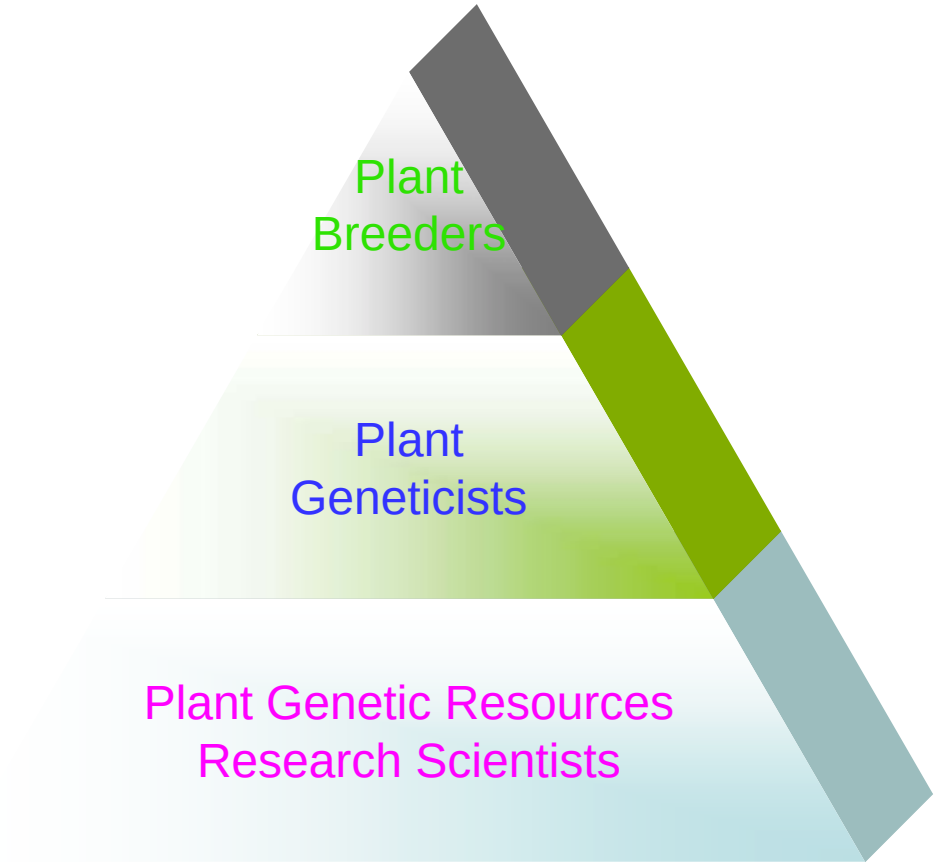


Applications of TaqMan® Technology

- Viral Quantification
- Quantification of Gene Expression
- Array Verification
- Drug Therapy Efficacy
- DNA Damage Measurement
- Pathogen Detection
- Genotyping

High-throughput SNP Genotyping by ABI 7900HT Sequence Detection System

Making the Link between Plant Breeding and Genetic Resources Conservation



Thank you for your attention