

2009 NORTHEAST SARE PARTNERSHIP GRANT PROPOSAL COVER SHEET

Project Title: Appletesters.net, A grower directed research tool for growers to access apple variety characteristics in order to better make planting decisions

Project Leader: Winfred P. Cowgill, Jr.

Affiliation: Rutgers New Jersey Agricultural Experiment Station

Project Leader address: Rutgers Cooperative Extension of Hunterdon County
P.O. Box 2900, Flemington, NJ 08822-2900

Telephone: 908-489-0207

E-mail address: cowgill@njaes.rutgers.edu

Fiscal agent for grants: Sarah Dumais, Office of Research and Sponsored Programs
Rutgers, The State University ASB III, 3 Rutgers Plaza, New Brunswick, NJ 08901

SARE request: \$ 9,995

Summary:

Appletesters.net will be a web database application allowing apple variety testers including growers, extension agents, private nurseries and fruit breeders to collect, manage, and share apple variety characteristic information. Selecting the best apple varieties for planting is the key component to the sustainability of orchard operations. Tree establishment in a new orchard block is a significant grower investment that can range from \$3,500 - \$12,600 per acre just for tree costs, with a total investment of up to \$16,000 per acre with trellis, irrigation and other fixed costs added. Because variety selection is so important to future orchard profitability, *appletesters.net* will help growers reduce risk and make informed orchard planting decisions. Any apple grower can visit and contribute to *appletesters.net*. *Appletesters.net* will be an asset to all apple growers because of the strategic role variety selection plays in orchard sustainability, and because of the value growers place on other growers opinions and experiences.

Cooperators – including any trained apple grower -- will be able to collect and enter apple variety information into a web page including tree characteristics, fruit quality, fruit appearance, and flavor. Such pooled information in a database will be invaluable to all apple growers and others who make variety selection decisions for new orchards. This database collection will allow all cooperators to evaluate apple varieties for performance in their growing region as well as in other geographical areas.

Identification and Sign-Off Page

List the **farmer cooperators** who have agreed to participate in your project. Give names and phone numbers. Each farmer cooperator must also attach a letter to this application.

- Skeeter Kielblock, Hillview Farms, NJ 908-647-0957
- Ken Nicewicz, Nicewicz Family Farm and
Massachusetts Fruit Growers' Association, MA 413-545-2963
- Mo Tougas, Tougas Family Farm and
Massachusetts Fruit Growers' Association 508-450-0844
- Gary Mount-Terhune Orchards, NJ 609-924-2232 gmount@alumni.princeton.edu

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List any **other cooperators** who will work on the project. Give names and phone numbers.

- Jon M. Clements, 413-478-7219. clements@umext.umass.edu Clements is Extension Fruit Specialist at UMass Amherst and will take a primary role as database developer and manager.
- Joe Goffreda, (732) 932-9711 x 202 goffreda@njaes.rutgers.edu Goffreda is Associate Professor and Rutgers NJAES Tree Fruit Breeder. He is also a principal in the Purdue-Rutgers-Indiana (PRI) cooperative fruit breeding program.
- Diane Miller (330) 263-3824 Ohio State University-expert in Bio-cultural diversity of apple (Malus) germplasm
- Wally and Wanda Heuser, International Plant Management (IPM) and Summit Tree Sales, Hartford, MI <http://www.summittreesales.com/> who has introduced many new tree fruit varieties that are widely available to all growers. Wally and Wanda will serve as advisors on what kind of fruit quality data to collect and in addition may submit variety characteristic information as part of a wider fruit testers network of growers that they work with.
- NECC-1009, USDA/CSREES Tree Fruit Varieties Coordinating Committee, www.ne183.org, NECC1009 is made up of some of the key apple evaluators and breeders in the North America, Canada, and Mexico. <http://www.nimss.umd.edu/homepages/home.cfm?trackID=7336> Rob Crassweller, Chair 814-863-6163 email: rmc7@psu.edu
- Midwest Apple Improvement Association (MAIA) – David Hall president-740-964-4744-represents 50 fruit growers

Institutional sign-off. We require evidence that the institutional official in charge of grants and contracts such as a sponsored programs office has approved your project. If you are applying as a nonprofit, the signature of an authorized official of your governing board is required.

Authorized individual signature _____ Date: _____

Name and title of authorized individual: __Sarah Dumais_____

Institution or organization: Office of Research and Sponsored Programs
Rutgers, The State University
Administrative Services Building
3 Rutgers Plaza
New Brunswick, NJ 08901

Phone: __732-932-0150 EXT. 2111_____ E-mail: __obrien@aorsp.rutgers.edu__

Project Leader signature: _____ Date: __12/07/08_____
Win Cowgill

Proposal checklist. Take a moment to make sure all your proposal components are present and in the following order:

- cover page, including project summary
- identification and signoff page
- narrative responses to proposal questions
- budget
- other resources
- letters from cooperating farmers
- IACUC approval form for projects involving animal research
- original and eight double-sided copies of all of the above

Include all materials in complete sets in one envelope. SARE staff will not sort or assemble application components or make insertions to proposals already received.

Project narrative

1. What is the problem and why is it important?

Apple growers face a myriad of decisions when planting new or replanting an existing orchard, including scion (fruit) variety, rootstock, spacing, and orchard system. Ultimately, the scion may be the most important because it is the fruit variety they will have to market and make a profit. Today's apple growers have more choice in variety (Honeycrisp, Cameo, Suncrip, Pinova, Snowsweet) and strains ('Marshall' McIntosh, 'Royal' Gala, numerous early strains of Fuji, etc.) than ever. Nursery catalogs tout new varieties and strains with glossy pictures and lavish descriptions often developed in other parts of the world with no regional testing.

This lack of information includes expert and farmer observations on field tolerance to diseases and regional horticultural adaptation.

Variety and strain selection is a daunting decision, often made with little help other than from the seller of nursery trees, yet is the most important fiscal decision to be made by a farmer, affecting the bottom line of the orchard business for the next 10-15 years.

What is needed for all apple growers and industry people is a tool that is grower friendly and easy to use but is a meaningful information system where data on the myriad of new apple varieties/selections/strains are made available. Results of these evaluations need to be immediately available for growers who need to make important orchard planting decisions that will reduce their risk and ultimately make them more profitable.

In the past, land grant university and extension personnel have provided non-biased evaluations of new apple varieties in research and grower orchards located throughout the USA. The NE-183 Multi-disciplinary Apple Cultivar Evaluation Project (www.ne183.org) was a good example of this (1995-2005). But, the number of public people doing this work is dwindling, and the overall apple variety landscape has changed significantly. For one thing, new ad-hoc as well as very professional public and private breeding efforts are evolving. In addition, patent and trademark rule interpretation and laws have changed and are being more closely followed to insure plant property rights. A new trend in the fruit business has been the use of 'Club' or 'Managed' varieties. This has added another new twist to the variety selection decision as these varieties and cultivars are no longer available to the small family farm so typical of the Northeast region. The Club system limits who may have access to the variety and tightly regulates the production and marketing of these varieties.

2. What is our proposed solution?

- Develop a web-based application (*appletesters.net*) to help make the number one decision for apple growers, *what variety to plant?*

- *Appletesters.net* will allow apple variety testers including growers, extension agents, private nurseries and fruit breeders to collect, manage, and share apple variety characteristic information. Selecting the best apple varieties for planting is the key component to the sustainability of orchard operations.
- The web-based tool is a database application, *appletesters.net*. The database, web interface be developed that will hold apple variety information and characteristics collected from throughout the major apple growing regions of North America, and Europe however, the emphasis will focus on the Northeast.
- The database will be self-populated by cooperators, including University and industry personnel and *growers* that will observe and record important horticultural characteristics including tree habit, bloom time, disease tolerance, mortality, precociousness, fruit appearance, taste, storability, and more.
- Results will be available to all cooperators and *growers* so that they can see what variety characteristics are performing best in their area. The database will include pictures and casual observations in addition to fruit quality measurements.

3. What are our project methods?

Appletesters.net will be a database-driven web application that will be built in spring-summer 2009 with significant input from growers and collaborators. They will collect and enter apple variety/strain observations into the database during the 2009 harvest season. The structure of the database will be modeled after a similar web application built by the Australian Pome Fruit Improvement Program at <http://www.apfip.com.au/>. Empirical observations on tree growth (bearing habit, precocity, spur- vs. non-spur type, etc.), flowering (precocity, bloom date and density, etc.), and fruit quality (harvest date, size, flesh firmness, skin color, soluble solids, etc.) will be collected and entered into the database. (See page 6 for example.) In addition, more casual observations on flavor and overall desirability will be made and entered. The database will be password-protected so that only selected cooperators can enter data, however, *any grower who is adequately trained to collect and submit valid data can cooperate*. Anyone will be able to search and view database fields.

The database will be built using prevailing web standards and it is anticipated it will remain functional far beyond the life of this project. Although future funding to maintain the project is not requested herein, it is hoped the database will prove valuable enough so that funding can be maintained by apple variety testing groups such as Midwest Apple Improvement Association, International Plant Management and NECC-1009, which are listed as 'other cooperators' in this project.

A significant effort will be made to attract cooperators from other areas of the world with new cultivars to advertise/promote.

Significant effort will be made to gather information on the new scab resistant and other disease resistant cultivars to populate the appletesters.net database from the breeding programs under way around the world but specifically in Europe.

Appletesters.net will become an important repository of cultivar/strain information on tree growth and fruit quality over many seasons. Such information should be very useful to apple growers looking for more and/or unbiased variety/strain information to make future planting decisions. (See Figure 1-page 6 for draft data sheet)

We will identify disease resistant cultivars and encourage testers to rate these characteristics.

The key characteristic of labeling an apple cultivar sustainable is a compilation of the horticultural traits testes evaluate; specifically precociousness, growth habit of tree (grower friendly), tendency of fruit to drop prematurely (drop), disease resistance, and other disorders observed.

We feel *appletesters.net* will become a primary source of information about apple varieties for the majority of orchardists that are not large enough to join the 'club' variety movement. This includes the majority of orchardists in the northeast.

Figure 1: Draft example of appletesters.net database record

2008appleharvest

Browse


Layout:
Layout #1

Record:
57

Total:
57


Unsorted

UMass CSOREC 2008 Apple Harvest



UMass/Amherst Outreach **UMass Extension**

| | | | |
|----------------|--|-----------|-----------------|
| Year | 2008 | Location | UMass CSOREC-B3 |
| Date | 10/30/2008 | Parentage | |
| Cultivar | Goldrush | | |
| Number | 10 | | |
| Drop | none | | |
| Size | 3.1 in. | | |
| Color | yellow % red | | |
| Firmness | 20.1 lbs. | Range | 19-24 |
| Soluble Solids | 14.6 % brix | | |
| Starch Index | 4.8 | Range | 3.5-6 |
| Taste | good, tart | | |
| Disorders | | | |
| Comments | 1st pick, nice; fruit size and maturity dependent on crop load; have already been frozen several times | | |



Goldrush

©2008 Jon Clements

4. What is the project timetable?

- Spring 2009 – appletesters.net database will be developed after soliciting input from selected growers/cooperators
- Summer 2009 – appletesters.net will be live and grower/cooperators will be trained on use
- Fall 2009 – farmers/cooperators will populate appletesters.net with apple variety observations; appletesters.net will be made available to public
- Winter 2009-10 – appletesters.net will be advertised in publications and grower meetings

5. How will we disseminate our results?

Appletesters.net is by nature about 50% an outreach project. In addition to traditional methods of advertising *appletesters.net*, including newsletters and meetings, it will be advertised on the apple-crop listserv, and other websites that are used by tree fruit growers, including industry publications such as Good Fruit Grower, American Fruit Grower, Horticultural News, Fruit Notes and Fruit Grower News
<http://www.fruitgrowersnews.com/>

We will publish our apple variety recommendations in our Rutgers New Jersey Commercial Tree Fruit Production Guide, which reaches every commercial grower in NJ. It is available in print and as a PDF file online free of charge at our NJAES website: <http://www.njaes.rutgers.edu/pubs/category.asp?cat=3> It will also be published in the New England Tree Fruit Production Guide, which reaches all fruit growers in New England.
<http://www.umass.edu/fruitadvisor/>

A comprehensive report will be prepared and published in our statewide publication, “Horticultural News”. We will also place an article in our New Jersey Plant and Pest weekly newsletter-Fruit Edition <http://njaes.rutgers.edu/pubs/plantandpestadvisory/>, and UMASS Fruit Advisor ‘Healthy Fruit’ newsletter.
http://www.umass.edu/fruitadvisor/healthy_fruit/index.html

These two publications are read by over 350 growers in 14 states. Presentations will be made at the 2010 Mid-Atlantic Fruit and Vegetable Conference in January, held in Hershey, PA. This is the largest trade show and conference in the Northeast for fruit growers. We will also present at the 2009 New England Vegetable And Fruit Conference in Manchester, NH. Presentations will also be made at the North and South Jersey Fruit meetings, which are attended by the majority of NJ fruit growers (200). Two twilight fruit thinning meetings will be held at the Rutgers Snyder Research and Extension Farm in April of 2009 and 2010. In the spring of 2010 a presentation will be made at series of twilight fruit meetings that cover growers in Massachusetts, New Hampshire and Rhode Island.

On the professional side, a poster presentation will be made for an American Society for Horticultural Science Meeting, and a refereed journal article will be prepared for

publication in HortTechnology (<http://www.ashs.org/publications.html>)

A comprehensive web presence is already in place and this information will be accessible through it. Announcements of publications and programs will be made to the Apple Crop Listserv that reaches over 600 growers, extension workers and researchers worldwide. (See #6 for web page references.)

6. What are our qualifications?

Win Cowgill – Professor and County Agricultural Agent with Rutgers NJAES. He has worked for Rutgers Cooperative Extension as an area fruit agent for the past 30 years conducting over 150 applied research and demonstration trials on both grower farms and at the Rutgers Snyder Research and Extension Farm (16 years). Cowgill has published over 300 articles in popular press, newsletters, extension publications and refereed journal articles. He has developed extension methodology for worldwide dissemination of information and technology primarily web based.

Jon Clements – Extension Educator serving as the UMASS-Amherst Fruit Specialist. Clements is an expert in developing websites, database management for websites and delivering content to their clientele via the web. Clements has programmed database driven membership applications for both CSRS research projects NC140 and NEC1009, as well as the Massachusetts Fruit Growers' Association – see <http://www.massfruitgrowers.org/page1.html>.

Cowgill and Clements have a combined 40 years experience in Cooperative Extension working with tree fruit growers to make them more environmentally and economically sustainable. Together they created the Virtual Orchard (virtualorchard.net) and apple-crop listserv in the mid-1990's and are considered pioneers in bringing tree fruit-related production information and collaboration to fruit growers nationwide using the Internet. They also work with the NC-140 and NECC-1009 regional research projects to develop websites (www.nc140.org, www.ne183.org) that disseminate current research information on rootstocks and tree fruit varieties and allow the committees to more effectively collaborate

This web based programming and resource availability developed by Cowgill and Jon Clements (UMASS) has been comprehensive and far reaching. These include the following:

| | |
|---|---|
| Apple Crop List Serv | http://www.virtualorchard.net/applecrop.html |
| UMASS Fruit Advisor | http://www.umass.edu/fruitadvisor/ |
| International Dwarf Fruit Tree Association 1996-February 200 | http://www.virtualorchard.net/idfta/default.html |
| The Virtual Orchard | http://www.virtualorchard.net |
| NC140 | http://www.nc140.org |
| Rutgers Apple Pages | http://www.virtualorchard.net/apples/index.html |
| Win Cowgill's Home page | http://www.virtualorchard.net/win/ |

Across these sites over one million page views are made annually.

Joe Gofredda – Tree fruit breeder at the New Jersey Agricultural Experiment Station-his breeding research emphasizes selection for disease resistance, winter hardiness, spring frost tolerance, and fruit quality. SunCrisp ‘NJ55’ apple was released in 1994, Goldrush ‘Co-op 38’, Crimson Crisp ‘Co-op 39’ are additional releases that have attracted a lot of attention. Joe is also a principal of the PRI cooperative scab-resistant apple breeding program between Purdue University, Rutgers, The State University of New Jersey, and the University of Illinois, By 2000, a total of 18 scab-resistant cultivars containing the Vf gene derived from *Malus floribunda* 821, were released by PRI alone or jointly with others and about 50 cultivars derived from PRI germplasm have been released by breeders world wide. Joe will provide descriptions of his advanced apple germplasm to fill the need for new high quality apple varieties adapted in the Northeast for direct market sales.

Diane Miller – Diane is from a fruit farm background (Doud Orchards in Indiana, a century-old business), has specialized in apple variety diversity, worked with Markus Kellerhals in Switzerland on apple seedling evaluation, completed a Fulbright Scholar project to the center of origin of apples (Kazakhstan and Kyrgyzstan) in 2004, compiling the story of the cultural heritage of apples, and has been an OSU faculty member for 20 years. She is the official Ohio State partner with the Midwest Apple Improvement Association project and will ensure consumer preferences noted in this research will be utilized in selection of outstanding seedling candidates for fruit traits and multiple disease resistances in future varieties. Her areas of expertise are Bio-cultural diversity of apple (*Malus*) germplasm, breeding utilization of traits such as antioxidants; tree disease-resistance including multiple gene scab resistance; and novel traits for tree or fruit) and cultural story of apples.

Wally and Wanda Heuser – Wally is recognized as one of the world's leading horticulturalists. His lifetime experience (over 50 active years) in apple variety and rootstock selection and orchard planning will be a tremendous asset. Former owner of Hilltop Nursery and Orchards, Wally brings apple cultivar experience from all aspects of the industry. They have identified, promoted and brought to market over 61 apple cultivars with International Plant Management and Hilltop Nursery.

7. Who are our cooperating farmers?

- Gary Mount owns and operates Terhune Orchards in Princeton NJ with his spouse Pam Mount. <http://www.terhuneorchards.com/> The Mounts have grown with over 200 acres under cultivation and 35 crops, all sold retail at their operation. The orchard operation focus's on varieties with over 35 apple cultivars grown. A five acre block of organically grown scab immune apples is in the works planted at extremely high density.
- The Midwest Apple Improvement Association (MAIA) <http://www.hort.purdue.edu/newcrop/maia/default.html> is a group of more than 50

fruit growers mostly from Ohio, Wisconsin, Illinois, and Indiana whose goals and activities include:

- Champion the cause: the need for a Midwest apple-breeding program
 - Carry out a grower driven, grower involved breeding program with the help of the Ohio State University and other research institutions, breeding and testing apple varieties uniquely adapted to Midwest growing conditions (which are likely suitable for Eastern orchards too)
 - Develop and carry out a marketing program for the varieties developed including nursery stock and the apples.
- Ken Nicewicz, former president Massachusetts Fruit Growers' Association (MFGA) and Nicewicz Family Orchard, Bolton, MA. <http://www.nicewiczfarm.com/> Ken will represent MFGA and his orchard, a small family farm that sells direct and at upscale farmers markets in the Boston metropolitan area.
 - Mo Tougas, Tougas Family Farm, Northboro, MA. <http://www.tougasfarm.com/> Mo is a former extension agent who with his family now runs one of the largest pick-your-own orchards in Massachusetts. He has been active in marketing the business on the Internet, and is also a skilled horticulturist who is constantly replanting new orchards with new varieties to meet his customer demand.
 - Skeeter (Ed) Kielblock, Hillview Farms, Myersville, New Jersey, <http://www.hillviewfarmsnj.com/> Skeeter is an established apple grower (fifth generation) who has cooperated in apple variety development with the Rutgers fruit breeding program since the 1950's (Ed Kielblock Sr.) He will provide apple varieties for entering into the database and his expertise on apple cultivar selection from his on farm testing program and his travels to all the apple growing regions in North America. He currently farms in two states, New Jersey and Vermont producing apples and other crops for retail sales.

BUDGET

Project Title: Appletesters.net, a web application to collect, manage, and share apple variety characteristics

Project Leader: Winfred P. Cowgill, Jr.

This budget must be completed and returned with your application. For each category, show the grant funds requested from SARE. Show how you arrived at your request by providing detail such as a per-unit cost multiplied by the number of units. To look at a sample budget, go to the last page of this document. Use more space as needed, but use only the budget categories given here.

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Personnel

| | |
|---|---------|
| Win Cowgill, Professor, Rutgers Cooperative Extension, 4 days @ \$457/day | \$1,828 |
| Support Staff | \$ 900 |
| Fringe benefits on above | \$ 725 |

Materials and supplies

| | |
|--|--------|
| Computer software usage fees, domain name registration, etc. | \$ 914 |
|--|--------|

Travel

| | | |
|--|----------------------|--------|
| Mileage to make training visits in Northeast | 1,000 @\$ 0. 50 | \$ 500 |
| Meals | 4 days @\$38/day | \$ 152 |
| Lodging Travel | 2 nights @\$90/night | \$ 180 |

Other direct costs

Farmer cooperators

| | |
|--|--------|
| Gary Mount cooperating NJ orchardist at \$20 an hour for 10 hours | \$ 200 |
| Ken Nicewicz, MA-cooperating orchardist and MFGA Representatives at \$20 an hour for 10 hours | \$ 200 |
| Mo Tougas, MA-cooperating orchardist and MFGA Representatives at \$20 an hour for 10 hours | \$ 200 |
| Skeeter Kielblock, NJ cooperating orchardist at \$20 an hour for 10 hours | \$ 200 |

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|--|--------|
| Collaborator/consultant, Jon Clements Data Base and web interface design, implementation and testing, 100 hours at \$45/hr | \$4000 |
|--|--------|

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|------------------------------------|-----------------|
| TOTAL grant funds requested | \$ 9,999 |
|------------------------------------|-----------------|

Other Resources

Numerous university and industry cooperators with expertise will be called upon (in kind) to help complete this project. These include researchers and extension specialists, particularly those affiliated with the NECC-1009 tree fruit variety evaluation project. Their goals and objectives sync with our proposal. At the NECC-1009 meeting in November 2007 the group endorsed the idea of an apple database for collecting and sharing information among researchers, fruit breeders, extension specialists, industry personnel, and fruit growers. See the NECC-1009 NIM's home page for the outline of this project: <http://www.nimss.umd.edu/homepages/home.cfm?trackID=7336>

For the list of NECC-1009 participants -See the NIMS website for listing of participants: <http://www.nimss.umd.edu/homepages/outlineAppE.cfm?trackID=7336>

In addition, the principals of this project (Cowgill and Clements) will contribute significant time and resources above and beyond the requested funds. (10 man days x 2=20)

Additional fruit growers will also be recruited to enter data into the database. The dollar value of these contributions is hard to estimate, but it could easily match or exceed the maximum amount, which is indicated below.

Dr. Joe Gofredda and Dr. Diane Miller will be professional collaborators from Rutgers and Ohio State that will contribute their expertise and time to this project as well Wanda and Walley Heuser, Summit Tree Sales an International Plant Management.

| | |
|--|-----------------|
| <i>In kind man days from other researchers in the NE1009 and our official cooperators above: Daily rates for salary at an Average of 400 day x 47 days</i> | \$18,800 |
| <i>Server space on the VirtualOrchard.net sever</i> | <u>350</u> |
| Total other inkind resources | \$19,150 |