# APPENDIX A. Supporting tables on NE9 crop importance and the PGRU conservation and distribution activities.

Table 1. Importance of the PGRU's vegetables and fruits to the U.S. Based on US Production Data from National Agricultural Statistics Service (2022).

|  |  |
| --- | --- |
| **Crops** | **Average U.S. Production Value from 2016-2021 in millions of dollars** |
| Artichokes | $67.01 |
| Asparagus | $87.66 |
| Broccoli | $825.92 |
| Cabbage | $451.25 |
| Cauliflower | $403.35 |
| Celery | $381.01 |
| Onions | $997.69 |
| Squash | $218.12 |
| Tomatoes | $1,713.47 |
| **Total vegetables** | **$5,145.48** |
| Apples | $3,129.97 |
| Grapes | $5,908.48 |
| Tart Cherries | $62.20 |
| **Total fruits** | **$9,100.66** |

Table 2. Number of **samples** distributed from PGRU **seed** collections from 2018-2022 by cooperator type.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooperator Type** | **2018** | **2019** | **2020** | **2021** | **2022** | **Total** |
| Foreign, Commercial Companies | 5872 | 3908 | 366 | 6851 | 592 | **17589** |
| Foreign genebank/genetic resource units | 6 | 30 |  - | 64 | 123 | **223** |
| Foreign Individuals | 771 | 47 | 170 | 6 | 27 | **1021** |
| Foreign Public Organizations (gov) | 2190 | 1259 | 965 | 1227 | 2056 | **7697** |
| US State Agencies & All Universities | 1713 | 2131 | 2000 | 2756 | 1069 | **9669** |
| USDA, ARS | 32 | 439 | 185 | 91 | 17 | **764** |
| USA Commercial Companies | 1988 | 1193 | 813 | 2219 | 790 | **7003** |
| Other USA Federal Agencies | 169 | 480 | 7 | 3 | 37 | **696** |
| USA Individuals | 263 | 693 | 380 | 167 | 164 | **1667** |
| US Non-profit Organizations | 614 | 61 | 102 | 7 | 27 | **811** |
| **Total** | **13618** | **10241** | **4988** | **13391** | **4902** | **47140** |

Table 3. Number of **unique accessions** distributed from PGRU **seed** collections from 2018-2022 by cooperator type.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cooperator Type** | **2018** | **2019** | **2020** | **2021** | **2022** |
| Foreign, Commercial Companies | 4890 | 3493 | 343 | 6546 | 584 |
| Foreign genebank/genetic resource units | 6 | 29 |  - | 64 | 123 |
| Foreign Individuals | 770 | 46 | 170 | 6 | 27 |
| Foreign Public Organizations (gov) | 1661 | 1185 | 790 | 1047 | 1524 |
| US State Agencies & All Universities | 1297 | 1510 | 1561 | 1902 | 942 |
| USDA, ARS | 32 | 398 | 125 | 76 | 17 |
| USA Commercial Companies | 1485 | 1059 | 686 | 1977 | 668 |
| Other USA Federal Agencies | 169 | 463 | 7 | 3 | 36 |
| USA Individuals | 255 | 647 | 359 | 163 | 149 |
| US Non-profit Organizations | 611 | 60 | 102 | 6 | 27 |

Table 4. Number of **samples** distributed from PGRU **clonal** collections from 2018-2022 by cooperator type.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Cooperator Type** | **2018** | **2019** | **2020** | **2021** | **2022** | **Total** |
| Foreign, Commercial Companies | 7 | -  | -  | 4 | -  | **11** |
| Foreign genebank/genetic resource units | 1 | 123 |  - |  - |  - | **124** |
| Foreign Individuals | 132 | 68 | 102 | 54 | 80 | **436** |
| Foreign Public Organizations (gov) | 16 | 34 | 1 | -  | 8 | **59** |
| US State Agencies & All Universities | 1911 | 1314 | 395 | 161 | 274 | **4055** |
| USDA, ARS | 331 | 1265 | 664 | 9 | 446 | **2715** |
| USA Commercial Companies | 684 | 412 | 240 | 80 | 136 | **1552** |
| Other USA Federal Agencies | 9 | 3 | 8 | 14 | 10 | **44** |
| USA Individuals | 4737 | 4558 | 2557 | 274 | 354 | **12480** |
| US Non-profit Organizations | 255 | 204 | 147 | 1 | 14 | **621** |
| **Total** | **8083** | **7981** | **4114** | **597** | **1322** | **22097** |

Table 5. Number of **unique accessions** distributed from PGRU **clonal** collections from 2018-2022 by cooperator type.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Cooperator Type** | **2018** | **2019** | **2020** | **2021** | **2022** |
| Foreign, Commercial Companies | 7 | -  | -  | 4 | -  |
| Foreign genebank/genetic resource units | 1 | 117 |  - | -  | -  |
| Foreign Individuals | 71 | 28 | 36 | 22 | 28 |
| Foreign Public Organizations (gov) | 15 | 29 | 1 |   | 8 |
| US State Agencies & All Universities | 1028 | 426 | 371 | 154 | 264 |
| USDA, ARS | 315 | 1184 | 664 | 9 | 437 |
| USA Commercial Companies | 457 | 335 | 211 | 72 | 128 |
| Other USA Federal Agencies | 6 | 3 | 8 | 14 | 10 |
| USA Individuals | 1586 | 1671 | 1209 | 184 | 304 |
| US Non-profit Organizations | 167 | 170 | 133 | 1 | 14 |

Table 6. Number of samples and unique accessions distributed to NE9 states from 2018-2022.

|  |  |  |
| --- | --- | --- |
| **State** | **Clonal**  | **Seeds** |
| **Samples**  | **Accessions** | **Samples** | **Accessions** |
| Connecticut | 77 | 70 | 18 | 18 |
| Delaware | 35 | 35 | 2 | 2 |
| Maine | 639 | 484 | 62 | 60 |
| Maryland | 748 | 667 | 99 | 90 |
| Massachusetts | 263 | 201 | 102 | 98 |
| New Hampshire | 95 | 88 | 106 | 106 |
| New Jersey | 85 | 83 | 187 | 177 |
| New York | 5065 | 2074 | 3992 | 3253 |
| Pennsylvania | 895 | 583 | 318 | 296 |
| Rhode Island | 27 | 27 | 1 | 1 |
| Vermont | 268 | 230 | 15 | 9 |
| West Virginia | 581 | 450 | 28 | 27 |
| **Total to NE9** | **8778** | **2823** | **4930** | **3788** |

**Appendix B:** PGRU References from 2018 to 2022

**2018**

Labate, J.A., A.P. Breksa III, L.D. Robertson, B.A. King, and D.E. King. 2018. Macro-element mineral concentrations in 52 historically important tomato varieties. Plant Genet. Resour. Characterization & Utilization (*in press*).

Gutierrez BL, Arro J, Zhong G-Y, Brown SK (2018a) Linkage and association analysis of dihydrochalcones phloridzin, sieboldin, and trilobatin in Malus. Tree Genet Genomes 14:91. <https://doi.org/10.1007/s11295-018-1304-7>

Gutierrez BL, Zhong G-Y, Brown SK (2018b) Increased phloridzin content associated with russeting in apple (*Malus domestica* (Suckow) Borkh.) fruit. Genet Resour Crop Evol 65:2135–2149. <https://doi.org/10.1007/s10722-018-0679-5>

Gutierrez BL, Zhong G-Y, Brown SK (2018c) Genetic diversity of dihydrochalcone content in *Malus* germplasm. Genetic Resources and Crop Evolution 65:1485–1502. <https://doi.org/10.1007/s10722-018-0632-7>

**2019**

Arro, J., Yang, Y., Song, G., Zhong, G. 2019. RNA-Seq reveals new DELLA targets and regulation in transgenic GA-insensitive grapevines. Biomed Central (BMC) Plant Biology. 9(1):80. <https://doi.org/10.1186/s12870-019-1675-4>.

Cadle-Davidson L, Londo J, Martinez D, Sapkota S, Gutierrez B (2019) From Phenotyping to Phenomics: Present and Future Approaches in Grape Trait Analysis to Inform Grape Gene Function. In: Cantu D, Walker MA (eds) The Grape Genome. Springer International Publishing, Cham, pp 199–222

Song, G., Walworth, A., Lin, T., Chen, Q., Han, X., Zaharia, L., Zhong, G. 2019. VcFT-induced mobile florigenic signals in transgenic and transgrafted blueberries. Horticulture Research. 6(105). https://doi.org/10.1038/s41438-019-0188-5.

**2020**

Brewer E, Cao M, Gutierrez B, Bateman M, Li R (2020) Discovery and molecular characterization of a novel trichovirus infecting sweet cherry. Virus Genes. <https://doi.org/10.1007/s11262-020-01743-7>

Gutierrez B, Battaglia K, Zhong G-Y (2020) Preserving the future with the USDA plant genetic resource unit tart cherry, grape, and apple germplasm collections. Journal of the American Pomological Society 7

Sun, X., Jiao, C., Schwaninger, H., Chao, T., Ma, Y., Duan, N., Khan, A., Xu, K., Cheng, L., Zhong, G., Fei, Z. 2020. Phased diploid and pan-genomes of cultivated and wild apples unravel genetic basis of apple domestication. Nature Genetics. <https://doi.org/10.1038/s41588-020-00723-9>.

Wang, Y., Xin, H., Fan, P., Zhang, J., Liu, Y., Dong, Y., Wang, Z., Yang, Y., Zhang, Q., Ming, R., Zhong, G., Li, S., Liang, Z. 2020. The genome of Shanputao (Vitis amurensis) provides a new insight into cold tolerance of grapevine. Plant Journal. <https://doi.org/10.1111/tpj.15127>.

Yang Y, Cuenca J, Wang N, Liang Z, Sun H, Gutierrez B, et al. (2020) A key ‘foxy’ aroma gene is regulated by homology-induced promoter indels in the iconic juice grape ‘Concord.’ Horticulture Research 7:1–12. <https://doi.org/10.1038/s41438-020-0304-6>

Zhao, D., Zhong, G., Song, G. 2020. Transfer of endogenous small RNAs between branches of scions and rootstocks in grafted sweet cherry trees. PLoS ONE. https://doi.org/10.1371/journal.pone.0236376.

**2021**

Dougherty L, Wallis A, Cox K, Zhong G-Y, Gutierrez B (2021) Phenotypic evaluation of fire blight outbreak in the USDA *Malus* collection. Agronomy 11:144. <https://doi.org/10.3390/agronomy11010144>

Gutierrez B, Schwaninger H, Meakem V, Londo J, Zhong G-Y (2021) Phenological diversity in wild and hybrid grapes (Vitis) from the USDA-ARS cold-hardy grape collection. Sci Rep 11:24292. <https://doi.org/10.1038/s41598-021-03783-x>

Han, X., Yang, Y., Han, X. *et al.* CRISPR Cas9- and Cas12a-mediated *gusA* editing in transgenic blueberry. *Plant Cell Tiss Organ Cult* **148**, 217–229 (2022). <https://doi.org/10.1007/s11240-021-02177-1>

Khan A, Gutierrez B, Chao CT, Singh J (2021) Origin of the Domesticated Apples. In: Korban SS (ed) The Apple Genome. Springer International Publishing, Cham, pp 383–394

Labate, J.A. (2021). DNA Variation in a Diversity Panel of Tomato Genetic Resources. Journal of the American Society for Horticultural Science 146, 339–345.

Migicovsky, Z., Gardner, K., Richards, C.M., Chao, T., Schwaninger, H., Fazio, G., Zhong, G., Myles, S. 2021. Genomic consequences of apple improvement. Horticulture Research. https://doi.org/10.1038/s41438-020-00441-7.

Stansell, Z., and Osatuke, A. (2021a). Cooperative approaches to standardize hemp phenotyping. Chronica Horticulturae 61.

Thapa R, Singh J, Gutierrez B, Arro J, Khan A (2021) Genome-wide association mapping identifies novel loci underlying fire blight resistance in apple. The Plant Genome n/a:e20087. <https://doi.org/10.1002/tpg2.20087>

Volk GM, Cornille A, Durel C-E, Gutierrez B (2021) Botany, Taxonomy, and Origins of the Apple. In: Korban SS (ed) The Apple Genome. Springer International Publishing, Cham, pp 19–32

**2022**

Arro, J., and Labate, J.A. (2022). Genetic variation in a radish (Raphanus sativus L.) geodiversity collection. Genet Resour Crop Evol 69, 163–171.

Brillouet J-M, Romieu C, Bacilieri R, Nick P, Trias-Blasi A, Maul E, et al. (2022) Tannin phenotyping of the Vitaceae reveals a phylogenetic linkage of epigallocatechin in berries and leaves. Annals of Botany mcac077. <https://doi.org/10.1093/aob/mcac077>

Kinard, G.R., Bassil, N.V., Hummer, K.E., Reinhold, L.A., Aradhya, M.K., Smith, J.L., Galarneau, E.R., Gutierrez, B.L. 2022. Conserving fruit and nut germplasm in the U.S. National Plant Germplasm System: foundation for our food supply. Pomona. Volume LV, No. 1, Winter 2022:31-33.

Song, G.-Q.; Urban, G.; Ryner, J.T.; Zhong, G.-Y. Gene Editing Profiles in 94 CRISPR-Cas9 Expressing T0 Transgenic Tobacco Lines Reveal High Frequencies of Chimeric Editing of the Target Gene. *Plants* **2022**, *11*, 3494. <https://doi.org/10.3390/plants11243494>

Volk, G.M., Dempewolf, H., Bramel, P., Meakem, V.M., Gutierrez, B.L. 2022. The USDA National Plant Germplasm System apple collection within the context of global crop conservation strategies. Journal of American Pomological Society. 76(2):50-58.

Wallis, C.M., Gorman, Z.J., Galarneau, E.R., Baumgartner, K. 2022. Mixed infections of fungal trunk pathogens and induced systemic phenolic compound production in grapevines. Frontiers in Fungal Biology. <https://doi.org/10.3389/ffunb.2022.1001143>.

Yang, Y., Ke, J., Han, X., Wuddineh, W., Song, G., Zhong, G. 2022. Removal of a 10-kb Gret1 transposon from VvMybA1 of Vitis vinifera cv. Chardonnay. Theoretical and Applied Genetics. https://doi.org/10.1093/hr/uhac201.

**Appendix C:** Facilities and Equipment

Facilities

1. PGRU is divided between three buildings located on the campus of the New York State Agriculture Experiment Station, Cornell University, Geneva, New York.
	1. USDA Building (592 m² or 6,372 sq ft) houses the laboratory, administration, components as well as facilities for clonal crops
		1. Five offices (114 m² or 1,227 sq ft), including Research Leader, Computer Specialist, Molecular Biologist, Computer support staff and Administrative Support Staff.
		2. Laboratory Space (157 m2 or 1,690 sq ft )
		3. Three Clonal Greenhouses (160 m2 or 1,722 sq ft)
		4. Headhouse (92 m² or 990 sq ft)
		5. Characterization room (30 m² or 323 sq ft)
		6. Cold Storage (26 m² or 280 sq ft)
	2. Clonal Office Building was finished in July 2001 with 4 scientist offices at 100 sq ft each. Technician room with 10 cubicle workstations for the clonal program technicians and breeding program technicians at 400 sq ft. One unisex bathroom and open storage area.
	3. The Seed Processing Building houses the NERPIS office, seed processing and storage facilities
		1. Office space (858 sq ft), contains three enclosed offices for Vegetable Curator/Horticulturist, Statistician and the Operations Manager. Desk space for Greenhouse Manager, three Agricultural Science Technicians and a Biological Science Aid.
		2. Vernalization chamber (291 sq ft) held at 20 °C and ambient humidity.
		3. Seed cold storage room (47 m2 or 529 sq ft) held at 0° C and 20% relative humidity.
		4. Cold storage anteroom (27 m2 or 330 sq ft) held at 4° C and 30% relative humidity.
		5. Restrooms (47 m2 or 506 sq ft) handicap equipped, separate for male and female.
2. Crop and seed production facilities include approximately 24.1 ha of land and 0.10 ha of greenhouses.
	1. Wellington farm (14 ha or 34.58 acres), is located 1.2 km (about 1 mile) north of the Cornell Agritech campus. The PGRU has a lease-to-own contract with Cornell University. The following site improvements have been made:
		1. Comprehensive field drainage system was installed in 1988.
		2. 1105 m2 (11,895 sq ft) field laboratory which includes a 277 m2 (2,982 sq ft) rodent proof storage area for pollination cages and bee keeping equipment, an 483 m2 (5,200 sq ft) farm equipment storage and workshop area and a 350 m2 (3,768 sq ft) heated field lab for planting, harvesting and seed cleaning operations was built in 1989.
		3. Twenty-five hive apiary on a gravel pad was established in 1992.
		4. Trickle irrigation was installed in 1992. The farm was divided into 8 irrigation zones which can be individually scheduled using electronic timers. The system includes a 18,920 liter (4,000 gallon) water storage tank and an injection fertigation system.
		5. Electrified deer fence was installed in 1992. A deer fence now encloses both the Wellington Farm and the adjacent McCarthy Farm which is used by the NCGR.
		6. 3-sided equipment shed
	2. McCarthy Farm (Approximately 20 ha or 50 acres) is located 1.3 km (about 1 mile) North of the NYSAES Campus. The PGRU maintains a long-term lease with Cornell University for this property.
		1. Comprehensive field drainage system was installed in 1984-85.
		2. Trickle irrigation was installed in 1984-85. There are 9 risers from the system which are normally controlled.
		3. Electrified deer fenced was installed in 1984-85. The fence was modified/extended in

1992 to encompass the Wellington Farm.

* + 1. 4.05 ha (10 acres) are leased from Cornell University on the Station Nursery Farm which is located 0.4 km (0.2 mile) north of the Wellington farm. Site improvements include trickle irrigation and field tile drainage.
	1. Greenhouse Facilities
		1. Construction was completed on two permanent USDA, ARS greenhouses (450 m2 or 5,000 sq ft) in 1992. One house (PGH-1) is equipped with aluminum-framed rolling benches, the other (PGH-2), has sand bed floors to accommodate pollination cages. Both greenhouses contain computerized environmental controls, automated drip irrigation systems, ratio:feeder fertilizer injector, hot water bottom heat for benches and ground beds and 1,000 watt sodium lights and are heated with steam. Approximate capacity is 5,000 1-gallon pots.
		2. Construction was complete in 2002 on a permanent USDA, ARS greenhouse (2,000 sq ft). The house (PGH-3) is equipped with sand bed floors and computerized environmental controls.
		3. Adjoining headhouse (148 m2 or 1,600 sq ft) contains 12.43 m2 (134 sq ft) potting bench space, 11 soil bins (4.5 hl), 2 walk-in vernalization coolers (92 m2 or 990 sq ft), steel shelving (30 m2 or 323 sq ft) for storage, and vented steel chemical storage cabinet for pesticide storage and was completed in 2004.

Information Management

Computer resources include a Dell server [PowerEdge R510 (4TB and 8TB HD, 64GB RAM, 1GB Network)] and Red Barn server [Supermicro SYS-8027R-TRF+ (20TB HD, 512GB RAM, 10GB Network)] housed by the Cornell University Computational Biology Service Unit for bioinformatics. Cloud storage solutions are available, allowing for the maximization of research and information security. An onsite USDA IT specialist is at the location, which helps to bridge the gap between university and USDA IT systems. Cornell University supplies high-speed Internet2 rated traffic. Our collaboration tools use voice over internet protocol (VoIP), Microsoft Teams, and Zoom.

Field Equipment

Equipment used for field maintenance and distribution of seed and clonal collections are listed below:

|  |  |  |
| --- | --- | --- |
| * 3 pt. hitch Spinner Spreader
 | * Debarder
 | * Rotary mower
 |
| * 4 Bottom Plow
 | * Disk
 | * Rotovator
 |
| * Air blast sprayer
 | * Drill
 | * Seed Counter
 |
| * Air Column (5)
 | * Flatbed trucks (5)
 | * Snowmobile
 |
| * ATV (4)
 | * Forklift
 | * Sprayer
 |
| * Auger
 | * Generator
 | * Straw Mulcher
 |
| * Boom Sprayer 110 gallon
 | * Gravity Separator
 | * Thresher (3)
 |
| * Brush Chopper, 5’
 | * Herbicide Sprayer (2)
 | * Tiller, 42” Rotovator
 |
| * Brush Machine
 | * Mower (2)
 | * Tiller, 68" Rotovator
 |
| * Cargo van
 | * Mower Walk Behind
 | * Tractor (14)
 |
| * Cleaner & Tester Mill Seed
 | * Mulch Layer
 | * Tractor Wagon
 |
| * Clipper (2)
 | * Mulch Transplantor
 | * Trailer (2)
 |
| * Crop care Mulch lifter
 | * Mulcher Pulvi/Teeth Notched
 | * Vegetable Seed Separator (2)
 |
| * Cultivator
 | * Multi-Crop Shredder
 | * Ventilation bin controller
 |
| * Cultivator - Vineyard
 | * Plow Coulter-Chisels SL
 |  |
| * Cutter Mower – Sickle-bar
 | * Power Pruners
 |  |

Laboratory and Characterization Equipment

Equipment used for characterization and research of seed and clonal collections are listed below:

|  |  |  |
| --- | --- | --- |
| * Autoclave
 | * HPLC Systems (3)
 | * Refractometer (2)
 |
| * Balance (3)
 | * Hybridization oven (2)
 | * Repeater Thin/Thin
 |
| * Calculator, DNA/RNA
 | * Ice machine
 | * Rotor (8)
 |
| * Centrifuge (7)
 | * Incubator (2)
 | * Shaker, Environmental (2)
 |
| * Centrifuge (refrigerated)
 | * Laminar Flow Hood (2)
 | * Shaker, Junior Orbital (2)
 |
| * Cold Chamber (2)
 | * Liquid nitrogen tank
 | * Speedvac (2)
 |
| * Digital imager/Analysis
 | * Lyophilizer system
 | * Still
 |
| * Dishwasher
 | * Microplate Reader
 | * Titrator, automated
 |
| * DJI Phantom Drone
 | * Oven (2)
 | * Transfer lamp
 |
| * Fotosystem 1000
 | * PCR Machine (8)
 | * Tristimulus Colorimeter (3)
 |
| * Freezer, -20℃ (2)
 | * Penetrometer, digital
 | * Uninterrupted Power Supply (2)
 |
| * Freezer, -80℃ (9)
 | * pH meter (2)
 | * Vacuum Centrifuge
 |
| * Genetic Analyzer
 | * Plate reader
 | * Vacuum Manifold
 |
| * GenoGrinder (2)
 | * Printer
 | * Water Filtration System
 |

# APPENDIX D: Project participants for the NE-9 Regional Research Project

1. Administrative Advisor

Dr. Olga Padilla-Zakour

Director

Cornell AgriTech at NYSAES

Geneva, NY 14456

oip1@cornell.edu

1. State Agricultural Experiment Stations of the Northeast Connecticut

VACANT

Storrs Agr. Exp. Sta. Univ. of Connecticut Storrs, CT 06269-4010

Delaware

VACANT

University of Delaware

Newark, DE 19711

Maine

VACANT

University of Maine

Orono, ME 04469

Maryland VACANT

University of Maryland College Park, MD 20742

Massachusetts

VACANT

University of Massachusetts Amherst, MA 01003-0910 fmangan@umext.umass.edu

New Hampshire

Dr. Christopher Hernandez Department of Plant Biology University of New Hampshire Durham, NH 03824

Dr. Iago L. Hale (Agriculture, Nutrition, and Food System)

385 Rudman Hall

University of New Hampshire

Durham, NH 03824

Iago.hale@unh.edu

New Jersey

Dr. Joseph Goffreda (Plant Breeding and Genetics) Department of Horticulture and Forestry

Rutgers University

New Brunswick, NJ 08903 goffreda@aesop.rutgers.edu

New York

Dr. Susan Brown (Horticulture)

120 Hedrick Hall

Cornell AgriTech at NYSAES

Geneva, NY 14456

Skb3@cornell.edu

Dr. Phillip Griffiths (Horticultural) 314 Hedrick Hall

Cornell AgriTech at NYSAES

Geneva, NY 14456

pdg8@cornell.edu

Dr. Michael R. Mazourek (Horticulture)

248 Emerson Hall

Cornell University

Ithaca, NY 14853

mm284@cornell.edu

Dr. Marc Fuchs (Plant Pathology and Plant-Microbe Biology)

Barton Laboratory

Cornell AgriTech at NYSAES

Geneva, NY 14456

mf13@cornell.edu

Dr. Awais Khan (Plant Pathology and Plant-Microbe Biology)

112 Barton Hall

Cornell AgriTech at NYSAES

Geneva, NY 14456

mak427@cornell.edu

Dr. Greg Peck (Horticulture)

121 Plant Science

Cornell University

Ithaca, NY 14853

gmp32@cornell.edu

Dr. Bruce Reisch (Horticulture)

204 Hedrick

Cornell AgriTech at NYSAES

Geneva, NY 14456

bir1@cornell.eud

Dr. Kenong Xu (Horticulture)

109B Surge Laboratory

Cornell AgriTech at NYSAES

Geneva, NY 14456

kx27@cornell.edu

Pennsylvania

Dr. Majid Foolad Department of Horticulture

Pennsylvania State University University Park, PA 16802 mrf5@psu.edu

Rhode Island VACANT

University of Rhode Island Kingston, RI 02881

Vermont VACANT

University of Vermont Burlington, VT 05405

West Virginia

Dr. Barbara E. Liedl Associate Research Professor

West Virginia State University

Gus R. Douglass Land-Grant Institute Agricultural and Environmental Research Station 129 Hamblin Hall

Institute, WV 25112-1000 liedlbe@wvstateu.edu

III. Federal Cooperators

Agricultural Research Service Dr. Thomas Shanower

Area Director

Northeast Area

USDA-ARS

Beltsville, MD 20705

tom.shanower@USDA.GOV

Dr. Peter Bretting USDA, ARS

National Program Leader - Plant Germplasm BARC-WestBeltsville, MD 20705 peter.bretting@usda.gov

Dr. Gary Kinard USDA, ARS

National Germplasm Services Laboratory BARC-West

Beltsville, MD 20705 gary.kinard@usda.gov

Dr. Karen Williams USDA, ARS

National Germplasm Services Laboratory BARC-West

Beltsville, MD 20705 karen.williams@ars-grin.gov

Dr. Christina Walters USDA, ARS

National Center for Genetic Resources Preservation Colorado State University

111 South Mason Street Fort Collins, CO 80523

christina.walters@usda.gov

Dr. Oscar Hurtado-Gonzales

Lead Plant Pathologist, Pome Quarantine ProgramMRP-APHIS-Field Operations

oscar.hurtado-gonzales@usda.gov

Dr. Gayle Volk USDA, ARS

National Center for Genetic Resources Preservation Colorado State University

111 South Mason Street Fort Collins, CO 80523 gayle.volk@usda.gov

Dr. Christopher Richards USDA, ARS

National Center for Genetic Resources Preservation Colorado State University

111 South Mason Street Fort Collins, CO 80523

christopher.richards@usda.gov

Dr. Benjamin Gutierrez

USDA, ARS -- Plant Genetic Resources Unit

Cornell University

Geneva, NY 14456

(315)-787-2439

Ben.Gutierrez@usda.gov

Dr. Gan-Yuan Zhong (Research Leader) USDA, ARS

Plant Genetic Resources Unit Cornell University

Geneva, NY 14456

(315) 787-2482

Fax: (315) 787-2339

GanYuan.Zhong@usda.gov

Dr. Zachary Stansell

USDA, ARS

Plant Genetic Resources Unit Cornell University

Geneva, NY 14456

Dr. Erin Galarneau

USDA, ARS

Plant Genetic Resources Unit Cornell University

Geneva, NY 14456

**APPENDIX E:** Projected participation, allocation of resources of state and federal participants for Regional Research Project NE9: Plant Genetic Resources Conservation and Utilization.

|  |  |  |  |
| --- | --- | --- | --- |
| **Participant Name, Email Address and Phone Number** | **Institution and Department** | **Research** | **Objectives** |
| CRIS Codes | Personnel |
| RPA | SOI | FOS | SY | PY | TY | 1 | 2 | 3 | 4 |
| Gan-Yuan ZhongGanYuan.zhong@usda.gov 315-787-2482 | PGRU, USDA, ARS | 202-1110-1080; 202-1112-1080202-1130-1080; 202-1131-1080202-1132-1080; 202-1139-1080 | 0.25 | - | 1.25 |  | X | X | X |
| Benjamin Gutierrezben.gutierrez@usda.gov315-787-2439 | PGRU, USDA, ARS | 202-1110-1080; 202-1112-1080202-1130-1080; 202-1131-1080202-1132-1080; 202-1139-1080 | 1.00 | - | 2.00 | X | X | X | X |
| Zachary Stansell zachary.stansell@usda.gov315-787-2454 | PGRU, USDA, ARS | 202-1110-1080; 202-1112-1080202-1130-1080; 202-1131-1080202-1132-1080; 202-1139-1080 | 1.00 | - | 2.60 | X | X | X | X |
| Erin Galarneau erin.galarneau@usda.gov315-787-2438 | PGRU, USDA, ARS | 202-1429-1080; 202-1430-1080202-1451-1080; 202-1460-1080202-1469-1080 | 1.00 | - | 6.60 |  | X | X | X |
| Peter Bretting peter.bretting@usda.gov 301-504-5541 | NPS, USDA, ARS,National ProgramLeader NP301 | 202-1110-1080; 202-1112-1080202-1130-1080; 202-1131-1080202-1132-1080; 202-1139-1080202-1429-1080; 202-1430-1080202-1451-1080; 202-1460-1080202-1469-1080 | 0.10 | - | - | X | X | X | X |
| Gary Kinard gary.kinard@usda.gov 301-504-5951 | National Germplasm Resources Laboratory USDA, ARS | 202-1110-1080; 202-1112-1080202-1130-1080; 202-1131-1080202-1132-1080; 202-1139-1080202-1429-1080; 202-1430-1080202-1451-1080; 202-1460-1080202-1469-1080 | 0.15 | 1.00 | - | X |  | X |  |

|  |  |  |  |
| --- | --- | --- | --- |
| **Participant Name, Email Address and Phone Number** | **Institution and Department** | **Research** | **Objectives** |
| CRIS Codes | Personnel |
| RPA | SOI | FOS | SY | PY | TY | 1 | 2 | 3 | 4 |
| Karen Williams karen.williams@ usda.gov 301-504-5421 | National Germplasm Resources Laboratory USDA, ARS | 202-1110-1080; 202-1112-1080202-1130-1080; 202-1131-1080202-1132-1080; 202-1139-1080202-1429-1080; 202-1430-1080202-1451-1080; 202-1460-1080202-1469-1080 | 0.15 | - | 0.15 | X |  |  |  |
| Christina Walters christina.walters@ usda.gov 970-495-3202 | National Center for Genetic Resources Preservation;USDA, ARS | 202-1110-1080; 202-1112-1080202-1130-1080; 202-1131-1080202-1132-1080; 202-1139-1080202-1429-1080; 202-1430-1080202-1451-1080; 202-1460-1080202-1469-1080 | 0.10 | 0.10 | 0.05 | X |  |  |  |
| Gayle Volkgayle.volk@usda.gov970-492-7607 | National Center for Genetic Resources Preservation;USDA, ARS | 202-1110-1080; 202-1112-1080202-1130-1080; 202-1131-1080202-1132-1080; 202-1139-1080202-1429-1080; 202-1430-1080202-1451-1080; 202-1460-1080202-1469-1080 | 0.10 | 0.10 | 0.05 | X |  |  |  |
| Christopher Richards christopher.richards@ usda.gov 970-495-3201 | National Center for Genetic Resources Preservation;USDA, ARS | 202-1110-1080; 202-1112-1080202-1130-1080; 202-1131-1080202-1132-1080; 202-1139-1080202-1429-1080; 202-1430-1080202-1451-1080; 202-1460-1080202-1469-1080 | 0.10 | 0.05 | X | X |  |  | X |
| Total SY, PY, TY and FTE | X | X |  |  |  | X | X | X | X |

1 Research Problem Area(s) (RPA), Subject(s) of Investigation (SOI), and Field(s) of Science (FOS) 2 SY = scientist years, PY = professional years, TY = technician years