Abundant Future:
Cultivating Diversity in Garden, Farm, & Field

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NEW YORK BOTANICAL GARDEN
Abundant Future: Cultivating Diversity in Garden, Farm, and Field celebrates the astonishing diversity and fascinating history of cultivated plants grown for clothing, healing, and most of all, for food. The subjects of these works were discovered on international travels, picked up at the farmer’s market, even plucked from artists’ own gardens. As the artists spent time with their chosen plants to ensure faithful depictions, they each learned about the history of cultivated varieties or the significance of wild relatives that played an important role in yielding the fruits and vegetables we know today. The exquisite works on view here celebrate the artistry of plant breeding; the challenges of maintaining genetic diversity in domesticated crops, many of which have lost traits that can help them resist climate change, environmental stresses, and disease; and the potential for rejuvenation to be found in heirloom and ancient plant revival.

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There are hundreds of species in the Cucurbitaceae (cucurbit) family. Pumpkins, squash, gourds, melons, and even gherkins were first cultivated in Central America. Species native to Central America, *Cucurbita pepo*, *C. moschata*, and *C. maxima*, were dispersed through trade and have become integral to cuisines worldwide. These species were bred through selection and hybridization to best suit the culinary needs of each culture. In Korea, *Cucurbita moschata*—typically thought of as tough-skinned squash or pumpkin with a “shell” like that of butternut squash—was bred to produce a thin-skinned, summer squash called *aehobak*, which is used in a multitude of recipes in Korean cuisine.
Sengmany Phommachakr
Long Pie Pumpkin
Cucurbita pepo ‘Long Pie’
Watercolor on paper
28 1/8 x 20 5/8 inches
Damodar Lal Gurjar
Pumpkin
*Cucurbita moschata*
Tempera on paper
15 x 22 inches
Kelly Radding
Charentais Melon
Cucumis melo ‘Charentais’
Egg tempera on panel
10 x 8 inches
Tammy McEntee
Blue Hubbard Squash
*Cucurbita maxima* ‘Blue Hubbard’
Colored pencil on paper
20 x 25 inches

The Three Sisters Hand Lens
Akiko Enokido
Shishigatani Kabocha Pumpkin
_Cucurbita moschata_
Watercolor on paper
18 x 18 inches
Lara Call Gastinger
Mexican Sour Gherkin
Melothria scabra
Watercolor on paper
15 x 15 inches
Seongweon Ahn
Fordhook Zucchini
*Cucurbita pepo* ‘Fordhook’
Colored pencil on paper
11 1/2 x 16 1/2 inches
Nightshades

The Solanaceae (nightshade) family consists of thousands of species. These include potatoes, peppers, tomatoes, tomatillos, eggplants, and others. Members of this family can be found on every continent except Antarctica. The plants appear in the form of herbs, shrubs, trees, vines, and sometimes epiphytes—plants that grow on other plants, not in soil. While some nightshades are edible, many are poisonous to humans, including deadly nightshade (Atropa belladonna), woody nightshade (Solanum dulcamara), and jimson weed (Datura stramonium), which contain toxic levels of alkaloids.
Eggplants, *Solanum melongena*, are believed to be native to India or Africa, though they have been cultivated across Southeast Asia for centuries. Eggplants were domesticated from *S. incanum*, a wild member of the nightshade family.
Lizzie Sanders
Edinburgh Potato
*Solanum x edinense*
Watercolor on paper
13 x 20 inches
Eggplants come in all shapes, sizes, and colors and can be found around the world, including at The New York Botanical Garden. In our Edible Academy we grow eggplants from countries far and wide in our plant beds.
Asuka Hishiki
Zapotec Pleated Heirloom Tomato
Solanum lycopersicum ‘Zapotec Pleated’
Watercolor on paper
8 1/2 x 10 1/2 inches

Did you know that all 7,000 varieties of tomatoes represent one species (Solanum lycopersicum)? In the William and Lynda Steere Herbarium we have hundreds of varieties documented.

See some of our collection here.
Janene Walkky
Jimmy Nardello Sweet Italian Peppers
Capsicum annuum ‘Jimmy Nardello’
Watercolor on paper
9 1/4 x 11 1/2 inches

Grow Your Own Peppers
Soybeans

Soybeans, *Glycine max*, are native to East Asia and are a key part of the regional cuisine. Soy sauce, tofu, bean paste, and tempeh are all derived from soybeans. A familiar side dish, edamame is made from steamed whole soybeans. The word edamame suggests how soybeans grow from a central stalk, *eda* meaning stem and *mame* meaning bean. Soybeans come in a few colors such as green, black, and brown. Black soybeans are used to create *kuromame*, or sweet black beans, which is an important part of the traditional Japanese New Year's feast, Osechi Ryori. While the beans are already very black, many recipes call for the addition of iron to make the color even darker.
Akiko Enokido
Black Soybean ‘Tambaguro’
Glycine max
Watercolor on paper
18 3/4 x 19 3/4 inches
Edamame is now a popular appetizer worldwide. In Japanese, *eda* means stem, and *mame* means beans. According to literature from 300 years ago, soybeans were boiled and sold attached to the branches, often on side streets. It is said that edamame originated in this era. When black soybeans were sold as edamame, it was misunderstood to be rotten and was unpopular, since they turn bluish-gray when boiled. Now we know that this color is due to anthocyanin in the skin of beans. Since black soybeans edamame are bigger and tastier than normal edamame, it is now considered a delicacy. At the farms in Tamba Sasayama, one third of black soybeans are sold as edamame each October. The rest are harvested in November, dried and used as an important ingredient for New Year's traditional dishes, as they have been since the early history of Japan.
Lynne Railsback
Soybean
*Glycine max*
Watercolor on paper
13 1/2 x 10 1/2 inches
Grains
Sally Petru
Sorghum
*Sorghum bicolor*
Watercolor on paper
25 x 12 inches
Jee-Yeon Koo
Revival after 100 Years
*Oryza sativa*
Watercolor on paper
23 5/8 x 21 inches
Rice is a staple around the world. There are two main species—*Oryza glaberrima*, African rice, and *Oryza sativa*, Asian rice—with hundreds of varieties. Rice is an important crop economically and nutritionally, and its cultivation is labor- and skill-intensive. In East Asia, farmers flood their rice fields to discourage weeds from overtaking the fragile plants. Once the rice has matured—about three months—the plant needs to be **threshed**, separated from the hulls that contain the grains. Then the hulls need to be winnowed in order to extract the grain.

In Korea, a farmer named Geun Yi Lee is working to restore native Korean strains of rice. During Japanese occupation, these strains of rice were all but replaced by more disease-resistant Japanese strains. His work has yielded the rediscovery and cultivation of more than 16 heirloom varieties.

**Learn more** about how the enslaved men and women from West Africa who were transported to South Carolina contributed to the rice growing process through innovative tools and highly specialized skills.

**The nomenclature of sticky rice**
Deborah Dion
Foxtail Millet, Three Species
Setaria italic, Setaria viridis, Setaria faberi
Watercolor, gouache, and graphite on paper
18 x 12 inches
Linda Medved Lufkin
Glass Gem Corn
*Zea mays* ‘Glass Gem’
Watercolor on vellum
11 1/2 x 9 1/2 inches
Zea mays, or maize, is native to Mexico and Central America. Learn more about the diverse specimens of maize in our Herbarium.
Susan Mintun
Emmer Wheat
*Triticum turgidum* subsp. *dicoccon*
Watercolor on paper
27 1/2 x 15 inches
Poppies

Of over 200 poppy species, only *Papaver somniferum* produces the poppy seeds we find in grocery stores. A milky sap or latex extracted from *P. somniferum* seed capsules is used for the production of opium, codeine, morphine, heroin, and other controlled substances, giving it the common name opium poppy. However, far more seeds are produced than latex, and the seeds contain only trace amounts of the alkaloids that make those substances potent. The seeds of *P. somniferum* are frequently used in baked goods such as breads, muffins, and bagels, lending its more apt common name, breadseed poppy.

For thousands of years, the process of harvesting opium has changed little. The bulbous seed pod emerges after the flower has bloomed, and harvesting, or “milking,” occurs when the pod is still green. When the fleshy part of the pod is slit, a milky substance leaks out and hardens on the seed pod. This “opium gum” is separated from the pod using a curved spatula and then dried to be further processed or shipped. The process for harvesting seeds requires leaving the stem and seed pod untouched to ripen, allowing the seeds to mature and become useable. Once the pod has become brown and woody, the seed pod can be cut off and split open to reveal hundreds of small black seeds.
Take an up-close look at one of our poppy specimens from the Herbarium. You can see the jagged edges of the leaves and the spherical seed pods at the ends of the stems.
Most fruit trees require some type of pollination in order to bear fruit. Pollination occurs when the ovules of a plant are exposed to pollen from the male element (anther) of the plant. Typically insects help the process of pollination by carrying pollen from one flower to another. Fig trees are pollinated solely by one specific species of wasps. The tiny wasp (*Wiebesia contubernalis*) is able to fit into the small immature fruit and pollinate the small flowers within it. In turn, the fig serves as the ideal place for the female wasp to lay her eggs, providing the larvae nourishment and shelter.
Margaret Best
Portuguese Quince
*Cydonia oblonga* ‘Portugal’
Watercolor on paper
14 7/8 x 10 inches

Portuguese Quince and San Rafael Quince on grounds
Joan McGann
San Rafael Quince
*Cydonia oblonga* ‘San Rafael’
Ink on illustration board
13 1/2 x 14 inches
Eunike Nugroho
Mutual Dependence (Wild Fig and Wasp)
*Ficus punctata, Wiebesia contubernalis*
Watercolor on paper
11 7/8 x 19 3/4 inches
Monika DeVries Gohlke
Pawpaw
*Asimina triloba*
Copperplate etching, hand-colored
12 x 12 inches

While pawpaw is native to the eastern United States and fairly common, most people have probably never seen the tree's yellow-green fruit. Noted for its creamy texture and tropical taste, pawpaw fruit requires pollination to grow. Pollination is a bit trickier for pawpaws than for other fruit trees because they need pollen from an unrelated pawpaw tree. Pawpaws grow in groves, comprised of a mother tree and genetically identical offspring, which can span acres. For a pawpaw fruit to grow, its flower must be pollinated from a separate grove of pawpaws.
Liz Shippam
Blackthorn
*Prunus spinosa*
Watercolor on paper
12 x 9 inches
There are many plums such as *Prunus americana* that are native to North America. While many are upright trees, others creep along the ground like *Prunus pumila* var. *depressa* 'Catskill'. Known as eastern sand cherry, this shrub has a deep, dense root system far more extensive than its spreading branches. This root system makes this cultivar a stabilizer along riverbanks and streambanks, such as the Delaware River that cuts through the Catskill Mountains. It produces small white flowers with yellow centers in spring.
Juror’s Work

Denise Walser-Kolar
Roxbury Russet Apple
*Malus domestica* ‘Roxbury Russet’ x 2
Watercolor on vellum
10 x 9 3/4 inches
Garlic and Onions

Garlic contains allicin, a sulfur compound that is part of the plant’s defense against pests that is released when it is crushed and is responsible for the bulb’s strong flavor and scent. In humans, evidence suggests that allicin may help lower cholesterol and blood pressure and has been associated with a decreased risk for some cancers. However, some studies suggest that large quantities of garlic, or supplements that contain allicin, can interfere with blood clotting, so doctors advise against taking garlic supplements or eating large quantities before surgery. Garlic powders and oils do not appear to have the same medicinal properties as whole garlic. To gain potential benefits from garlic, buy whole cloves and incorporate them into your cooking. Garlic, one of the most popular plant-based cooking ingredients, is used in many dishes and cuisines worldwide.

Garlic, onions, leeks, chives, and shallots are all part of the Allium, the only genus in the Allieae (allium) subfamily within the Amaryllidaceae (amaryllis) family. Allium is derived from the Greek word for garlic, and this genus has been an important group of plants for thousands of years. It was first described in 1753 by Carl Linnaeus, who developed the two-part plant naming system we recognize today.
Kathy Schermer-Gramm
Porcelain Hardneck Garlic Scapes
Allium sativum
Watercolor on paper
14 x 11 inches

How to grow garlic
Gillian Rice
Tohono O'odham I'itoi Onion
*Allium cepa*
Watercolor on paper
17 x 11 inches

Onions add wonderful flavor to many dishes, but did you know that they can also add spectacular color to gardens? In summer, along our Daylily/Daffodil Walk ornamental onions produce bright-purple orbs that line the pathway. **Check out some of our favorite ornamental onions**
Did you know bananas are berries? And did you know strawberries are not berries? Other common botanical misnomers are raspberries and blackberries. Botanically, berries are formed from the ovary of a single flower. When pollinated, the ovary begins to develop flesh around it and the seeds mature. Pollination occurs when the ovules of a plant are exposed to pollen from the male element (anther) of the plant. While berry-bearing plants do not fit neatly into a single genus or family, they are collectively considered bacciferous or baccate.
Linda Powers
Poorman Gooseberries, Utah 1888
Ribes uva-crispa ‘Poorman’
Watercolor on vellum
13 1/4 x 10 inches
Constance Scanlon
Heirloom Blueberry Branch # 1
Vaccinium corymbosum ‘Stanley’
Watercolor on vellum
9 x 10 inches
Betsy Rogers-Knox
Wild Fox Grapes
*Vitis labrusca*
Watercolor on paper
16 x 21 inches

There are hundreds of varietals of grapes, wild and domesticated, such as pinot noir or cotton candy, and also the Bronx grape. The Bronx grape was domesticated in 1930s by a New York Botanical Garden scientist, Dr. Arlow B. Stout, who partnered with Cornell University’s New York State Agricultural Experiment Station to make a seedless, tasty, and hardy grape. Today you might find the descendants of the Bronx grape among the seedless grapes at your local grocery store.

*Seedless Grapes, With Roots at NYBG*
Salad Days

The rainbows of the plant world, radishes and swiss chard capture the whole spectrum of color. They are also entirely edible. Yes, you can eat the radish greens and the multicolored stems of chard! We grow swiss chard and radishes of all shapes and sizes in the Edible Academy, capturing the diversity of radishes around the world. In cooking, radish greens and swiss chard are considered tender greens rather than kale and collard greens, which are hearty greens. Tender greens cook down faster in warm dishes similar to spinach.

Our Edible Academy has developed many recipes incorporating the harvest from the planting beds.
Mitsuko Schultz
Swiss Chard
Beta vulgaris ‘Ruby Red’
Watercolor on paper
15 1/2 x 11 1/2 inches
Sengmany Phommachakr
Radishes
*Raphanus raphanistrum* subsp. *sativus*
Watercolor on paper
20 x 12 3/4 inches
Beverly Duncan
Garden Tangle
*Raphanus sativus* ‘De 18 Jours’
Watercolor on paper
16 1/2 x 19 inches
Tropical Delicacies

The tropics are generally understood as regions north and south of the equator between the Tropics of Cancer and Capricorn. The tropics encompass many different habitats. While coffee grows in upland rain forests—rain forests at higher altitudes, with slightly cooler temperature ranges—Pandanus grows along wind-whipped ocean shorelines, and vanilla orchids thrive in the heat and humidity of lowland rain forests. Several New York Botanical Garden scientists study areas in the tropics such as Vanuatu in the South Pacific. Learn more about our work in Vanuatu.
Carol Woodin
Vanilla Orchid
*Vanilla planifolia*
Watercolor on vellum
14 x 9 3/8 inches
Mariko Ikeda
Jorum Pandanus
*Pandanus tectorius* ‘Jorum’
Watercolor on vellum
28 5/32 x 23 15/32 inches
Mariko Ikeda  
Jorum Pandanus

Artist Story

*Pandanus tectorius* ‘Jorum’ is an important food on Pacific islands, particularly the Micronesian atolls. It contains high levels of carotenoids and vitamins, and provides further health benefits. Cultivars have been selected through time to produce a large, sweet fruit. Those unsuitable for human consumption were discarded. *Pandanus* has traditionally been planted along the seashore with the dual purpose of providing nutrition and preventing soil erosion. However, recent years have seen a rise in concern regarding people leaving the atolls and a loss of traditional culture due to the modernization of lifestyles. The cultivation of *Pandanus* is also feeling these effects. *Pandanus tectorius* itself is not rare, but its use for human consumption outside of the atolls is limited. It is for this reason that I believe we can discover unique values in the abundant range of cultivars that serve as evidence of uninterrupted cultural practice.
Sarah Howard
Ethiopian Limu Coffee
*Coffea arabica*
Watercolor on paper
13 7/8 x 14 1/4 inches
Non-Edible Plants

Inedibility does not make plants any less significant. Raffia palm, which is native to the tropical regions Central and South America, is known for its long leaves. Some of the longest in the plant kingdom, they can reach over 80 feet long. *Raphia taedigera* is noted for the fibers that the veins of its leaves produce. These fibers are used for ropes, baskets, and other woven products. The palm is **monocarpic**—after it flowers and produces fruit, it dies—and the fruit it produces gives the palm its other common name, pine cone palm.
Barbara Oozeerally
Seedheads of Raffia
*Raphia taedigera*
Watercolor on paper
19 x 11 inches
Susan Tomlinson
Early Cotton
*Gossypium herbaceum*
Watercolor on paper
12 x 9 1/2 inches