CORNELL VEGETABLE PROGRAM

2016



KNOWLEDGE IS POWER

CORNELL VEGETABLE PROGRAM SPECIALISTS PROVIDE

educational programs and information to growers, processors and agribusiness professionals, empowering them with the knowledge to profitably produce and market safe and healthful vegetable crops, contributing to the viability of farms and the economic wellbeing of New York State.

Highlights





The Cornell Vegetable Program, a Cornell Cooperative Extension regional agriculture team, serves the vegetable, greenhouse, potato and dry bean industries in a 12-county region of Western New York.

This region accounts for more than half the acres of the New York vegetable industry, with 1,017 vegetable farms and an estimated farm gate value of more than \$250 million.

SAFER PRODUCE AND REDUCED STORAGE ROT DUE TO FARM FOOD SAFETY TRAININGS

Further investigation into methods of reducing microbial risk on the farm is being demanded. Microbial risk not only refers to human pathogens but plant pathogens that can reduce storage quality. The Cornell Vegetable Program (CVP) partnered with the University of Vermont on a grant project to explore actions farms can take to reduce microbial contamination of produce during the wash process and reduce storage rots, leading to a safer product for consumers and reduced storage losses for the farm.

To further assist WNY produce growers, the CVP began providing on-farm food safety assessments in 2016. Twenty-six operations were visited to see how well food safety plans were implemented and to assist in preparation for a GAPs/HGAPs certification audit. Certification opens new market opportunities and can increase profits.

Looking forward, the Cornell Vegetable Program will be working with the CCE Lake Ontario Fruit Team, NOFA-NY, and UVM to conduct in-depth farmer and buyer training in food safety to post-harvest, irrigation, wildlife management, and packing, through a multi-year educational outreach grant.

BEET ADVISORY GROUP DIRECTS WEED AND DISEASE MANAGEMENT RESEARCH

Growers and allied industry members are critical in the support of grant applications and subsequent research and Extension activities. In March, 22 members from local farms, industry, granting agencies, and Cornell met at a CVP-organized advisory to discuss production of table beets. The group provided direction for research funded by a New York Specialty Crops Block Grant (Pethybridge, Kikkert, Reiners, Telenko). Small plot trials were established at Cornell's research facilities in Geneva and Freeville. Beet varieties demonstrated varied resistance to leaf spot disease; and in separate studies, good control was achieved with some of the conventional and organic fungicides tested. Weed management focused on new products and different rates and combinations of currently registered herbicides. Grower fields were visited throughout the season to monitor weeds and diseases, and to discuss management options, such as the use of cultivation equipment. Diseased leaves and roots were collected for genetic studies and to provide inoculum for research trials. Results will be presented at upcoming meetings and one-on-one consultations.



Farm visits and crop consultations made by the Cornell Vegetable Program team



Educational meetings and presentations given by Cornell Vegetable Program Specialists

5,363



People increased their knowledge by attending presentations made by the Cornell Vegetable Program







ONION SCOUTING PROGRAM GUIDED REDUCED FUNGICIDE USE IN A DRY YEAR

For over a decade, the Cornell Vegetable Program (CVP) has conducted a "research scouting" program for large-scale muck onion growers to reduce pesticide use by spraying pesticides only when pests exceed economical thresholds. Every week, the CVP quantifies pest pressure on 12 selected onion fields in the Elba muck and Wayne and Yates counties. The scouting data is summarized and the 10 growers participating in the program receive the scouting reports and recommendations based on latest research findings.

Traditionally, to control the perennial leaf disease Botrytis Leaf Blight (BLB), large-scale muck onion growers begin their fungicide spray program in mid-June and spray every week for 8-12 weeks until onions reach 50% lodging. In the hot and dry 2016 growing season, onion growers watched the pest pressure on their farm and neighboring farms through the CVP Onion Scouting Reports and, because the BLB pressure/risk was very low, growers gained the confidence to skip fungicide applications, reducing fungicide sprays for BLB by 74% to an average of 1.3 times and reducing their costs by 83% to only \$13/A.

SUMMER INTERNSHIP PROVES VALUABLE TO STUDENTS AND WNY VEGETABLE TEAM

In 2016, the Cornell Vegetable Program provided an internship opportunity for two undergraduate students to work alongside the team's vegetable specialists. Gretchen Seigworth (junior in Agribusiness Management at Penn State University) and Jodi Callwood (senior in Bioengineering at Walla Walla University) worked under the direction of Darcy Telenko as part of the iPiPE CAP (Integrated Pest Information Platform for Extension and Education, Cooperative Agricultural Project) internship program. The purpose of the program was to give an opportunity for undergraduate interns to learn about Integrated Pest Management (IPM) practices and how to scout for pests in the field.

Gretchen and Jodi received hands-on training on pest identification and proper scouting techniques in vegetable crops on 22 different farms in six counties, how to utilize IPM tools, and enter and manipulate data. They proved to be assets to the Cornell Vegetable Program by assisting with multiple field days and research trials as well as contributing field observations to weekly crop insights and co-authoring ten articles in VegEdge newsletters.

FIELD MEETINGS PROVIDE NEW INSIGHTS TO FRESH MARKET GROWERS

Cornell Vegetable Program (CVP) team members managed numerous research and demonstration trials in 2016. Growers and industry partners were invited to view plots, learn the latest research results, and tap into the expertise of our vegetable specialists. In early July, the Fresh Market Vegetable Field Day at the Cornell Vegetable Program's demonstration site in Batavia focused on early disease detection and weed management. Six farms hosted meetings where topics about cultural and pest management practices in both field and greenhouse (high tunnel) were presented to over 300 vegetable growers. At the annual Fresh Market Potato meeting, variety trials on the muckland and other topics from Cornell researchers were presented. Lastly, a Sustainable and Organic Vegetable Pest Management Field Day was held August 31 at the Cornell Lake Erie Research and Extension Lab which hosted research plots on fresh market vegetables for the first time this year.

Workshops and meeting locations vary by year based on meeting topics and research sites. A listing of all past and future events can be found on the CVP website.

Research Grants

Funding received October 2015—September 2016

CABBAGE & COLE CROPS

Evaluating New Herbicides for Potential Registration in Transplanted Cabbage and Broccoli, Cabbage Research and Development Program, (Telenko, Hoepting, Reiners), \$7,222, 4/1/16 - 3/31/17.

Optimizing Management of New Invasive Species, Swede Midge on Small-Scale Organic Farms: Part II, NESARE Partnership, (Hoepting), \$14,999, 2/12/16 - 4/15/17.

Prevention of Brassica Crop Losses from New Invasive Species, Swede Midge on Small-Scale Organic Farms: Part II, Cornell Towards Sustainability Foundation, (Hoepting), \$10,000, 1/1/16 - 12/31/16.

Nitrogen Dynamics in Cabbage Part III: Nitrogen Stabilizers, Cabbage Research and Development Program, (Hoepting), \$7,500, 4/1/16 - 3/31/17.

Developing an Eastern Broccoli Industry through Cultivar Development, Economically and Environmentally Sustainable Production and Delivery, National Institute of Food and Agriculture (NIFA), (Bjorkman, Sams, Farnham, Davis, Coolong, Zotarelli, Ozares -Hampton, Thayer, Bihn, Griffiths, Hoepting, Slack, Wind), \$5,351,783, 9/1/16 - 8/31/18.

DRY BEANS

Weed Management Research in Dry Beans, NYS Dry Bean Industry Advisory Committee, (Telenko, Reiners), \$3,000, 4/1/16 - 3/31/17.

Determine the Magnitude and Distribution of Western Bean Cutworm, and the Risk to Dry Beans, in the Major Production Area in New York, New York State Dry Bean Industry Advisory Committee, (MacNeil), \$3,000, 7/1/16 - 6/30/17.

GARLIC

Improving Profitability of Garlic Production through Understanding and Management of Fusarium Diseases, NESARE Research and Education, (Stewart, Hoepting, Hay, Hadad, McGrath, Menasha), \$125,531, 9/1/16 - 8/31/19.



HIGH TUNNEL

Best Management Practices for Long Term High Tunnel Soil Sustainability, Cornell Toward Sustainability Foundation, (Reid, Hall), \$10,000, 4/1/16 - 3/31/17.

Best Management Practices for Long Term Profitable High Tunnel Soil Fertility and Health, New York Farm Viability Institute (NYFVI), (Reid, Hall, NOFA-NY), \$116,126, 4/1/16 - 3/31/18.

Advancing Vegetable Production in Northern New York, NNY Ag Development Program, (Reid, Ivy), \$19,256, 4/1/16 - 12/31/16.

Increasing Yield by Controlling Leaf Mold in Tomato High Tunnel Production, NYFVI, (Smart, Reid), \$108,977, 1/1/16 - 12/31/17.

ONIONS

Weed Management in Muck-Grown Onions, Onion Research and Development Program, (Hoepting), \$14,110, 4/1/16 - 3/31/17.

Fungicide Evaluation for Control of Botrytis Leaf Blight in Onion, Onion Research and Development Program, (Hoepting), \$5,822, 4/1/16 - 3/31/17.

Improved Management of Stemphylium Leaf Blight in Onion in NY, Onion Research and Development Program, (Hay, Pethybridge, Hoepting), \$16,472, 4/1/16 - 3/31/17.

PROCESSING CROPS

Weed Management Research for Sweet Corn, Peas, Snap and Lima Beans, Beets, and Carrots, New York Vegetable Research Association/Council, (Telenko, Reiners), \$42,000, 4/1/16 - 3/31/17.

Towards a Durable Management Strategy for Cercospora Leaf Spot in Table Beet, USDA CPPM, (Pethybridge, Vaghefi, Hanson, Kikkert), \$324,858, 9/1/16 - 8/31/18.

Beating Beet Diseases, CCE Summer Intern Program, (Pethybridge, Vaghefi, Kikkert), \$4,500, 6/1/16 - 8/30/16.

GENERAL / OTHER

Climate Smart Farming Extension Team, Hatch, (Chatrchyan, Telenko), \$5,000, 10/1/15 - 9/30/16.

iPiPE: Vegetable Component, USDA-NIFA-AFRI, (Telenko), \$76,714, 3/1/16 - 2/28/18.

Evaluation and Demonstration of Integrated Disease and Weed Management Options for Organic Vegetable Production, Cornell Toward Sustainability Foundation, (Telenko, Hadad, Reid), \$10,000, 3/1/16 - 2/28/17.

Minimizing Wildlife Impacts on Yield and Food Safety Risk in Vegetables by Utilizing Repellency Tactics, NYFVI, (Telenko, Hadad, Zuefle), \$74,534, 6/1/16 - 5/31/18.

Jud's research and knowledge carry a lot of weight in this community and others. A lot of growers around here factor Jud's insight into what type of varieties they plant and sell and how they use their high tunnel space.



HIGH TUNNELS, HIGH IMPACT: SEASON EXTENSION PROGRAM

By working with the Cornell Vegetable Program (CVP), high tunnel farmers are increasing profits by thousands of dollars through improved pest management and the implementation of soil/nutrient Best Management Practices (BMPs).

Season extension – the use of technology to protect crops from adverse weather – has become an important part of the New York vegetable industry. In the last census there were over 435 season extension operations, a 100% growth from the previous 5 year period; a statewide value of \$30 million. Growers have found high tunnels (low-to-minimally heated greenhouses) to be a profitable investment through earlier crop maturity, higher total yield and quality as well as disease and insect management. New York State is now the national leader in number of winter farmers markets, and high tunnels are credited for this success in a recent USDA report. The Cornell Vegetable Program has been at the forefront of high tunnel/greenhouse research and Extension in New York, receiving over \$250,000 in funding over the last 12 months alone to work on nutrient management, disease control, grafting and economics.

One of the primary roles the Cornell Vegetable Program has played in season extension has been in disease management. Protected environments reduce common diseases of tomatoes by eliminating leaf moisture from rain and splashing soils. However, other diseases are favored by the tunnel environment. Leaf Mold, caused by the fungus *Passalora fulva*, can drastically reduce tomato yields. The CVP has conducted resistance trials and published 3 peer-reviewed papers on varietal disease susceptibility to Leaf Mold. To further research on management of the disease, a collaboration was established with Professor Chris Smart at the NYS Agricultural

Experiment Station and funded by the New York Farm Viability Institute for \$108,977. This project will further our understanding of the disease genetics and epidemiology, but most importantly improve farm profitability by identifying key management steps.

In addition to diseases, the CVP has led statewide efforts on insect control in greenhouse vegetables. Insect management in winter greenhouses is complicated by cold temperatures and short days. The CVP recently completed a 4-year NESARE sponsored project examining insect control in the colder months. As a result of this project, 24 winter greens high tunnel growers adopted biological control methods to manage pests with an average increase in revenue of \$2,465.

However, growers are finding that long term soil health and fertility management in high tunnels is different than field growing. Sound research-based information, coupled with education on BMPs will ensure long term sustainability, resulting from improved nutrient management and higher profitability. The CVP recently completed a project where 15 farms increased net high tunnel income by an average of \$4,932, or 46%. Tunnel area increased by 16%, representing new capital investment of \$32,050 during the project period. In 2016, a collaboration with NOFA-NY was funded for \$116,126 to continue this research.

To perform outreach in this subject area, the Cornell Vegetable Program manages a YouTube channel with over 30,000 views as well as an active Twitter account, serves as the official managers of the Cornell High Tunnel webpage, completes hundreds of farm visits per year, and attends local, national, and international speaking engagements.

Generous Support

Without the financial and in-kind donations by area vegetable producers and agribusinesses, the Cornell Vegetable Program could not offer the level of support that we provide to the New York vegetable industry. Thank you!

IN-KIND DONATIONS

A. Sam Farms, Esau Sam – Caps Tomato Survey

Abe Datthyn Farms, Mike Johnson – Onion Thrips Scouting Project

Amos Zittel & Sons, Mark Zittel – Climate Smart Farming; Minimizing Wildlife Impact in Vegetables; research trials; Sweet Corn Pheromone Trap Network

Andy Byler – Sweet Corn Pheromone Trap Network

Bejo Seeds – seed for research trials

Big O Farms, Mark Torrey and Max Torrey – Onion Thrips Scouting Project; Potassium and Sodium Hypochlorite for Control of Bacterial Bulb Rot; Effect of Foliar Feeding and Relative Performance of Fungicides on SLB

BioWorks – product for tomato trials

Blue Heron Farm, Lou Johns – Swede Midge Project

Branton Farms, Donn Branton – Improving Soil Health; Climate Smart Farming; Batavia CVP Demo Site prep

Buzz's Garden, James Cagle – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

Canticle Farm, Mark Printz – Swede Midge Project

Carriage House Garden Center, Mike McCauliffe – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

Clearview Farm, Kurt Forman – squash trial

Crop Advantage, Don Sweet – SCBG Beet Project: Advisory Committee

Curvin Martin – Orleans Produce Auction Growers Meeting

CY Farms, Chuck Barie and Emma Long – Onion Thrips Scouting Project; Potassium and Sodium Hypochlorite for Control of Bacterial Bulb Rot

David Fox – Finger Lakes Produce Auction Growers Meeting; Pollinator Research Trials

David K. Stoltzfus – Seneca Produce Auction Growers Meeting

Dewey Produce, Mark Dewey – SCBG Beet Project: Advisory Committee

Dilmun Hill Student Farm, Betsy Leonard – BMPs for Long Term High Tunnel Soil Sustainability

Emmuel Byler – Chautauqua Produce Auction Growers Meeting

Empire Tractor – Field Day equipment

Farm Fresh First, Michael Gardinier – SCBG Beet Project: Advisory Committee

Fellenz Family Farm, Andy Fellenz – Swede Midge Project; BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

Fentons Produce, Paul Fenton – Caps Tomato Survey, Sweet Corn Pheromone Trap

Floyd Zimmerman – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

Fraser's Garlic Farm, Ed Fraser – ethnic vegetable trial Fred Farms, Roberto Fred – Caps Tomato Survey

Fresh Ayr Farm, George Ayres – White Mold Project

Gary Swede Farms, Ryan Swede – Lima Bean Leaf Disease Management

Gowan Company – product for research trials

Happenchance Farm, Jamie Snyder – Advancing Season Extension Hemdale Farms, Dale Hemminger and Casey Kunes – Finger Lakes Soil Health Meeting host

Henry W. Agle & Sons, John Agle – Minimizing Wildlife Impact in Vegetables; Caps Tomato Survey

Howard Hoover – tour for Principles of Vegetable Production class

J. Hurtgam Farms, Jeff Hurtgam – Minimizing Wildlife Impact in Vegetables; Caps Tomato Survey; Sweet Corn Pheromone Trap Network

Joe Bezon & Sons, Jim Vogt – Onion Thrips Scouting Project

Joel Weaver – Advancing Season Extension

Johnson Potato Farms, Mark Johnson and Jack Johnson – Onion Thrips Scouting Project; Potassium and Sodium Hypochlorite for Control of Bacterial Bulb Rot

Journey's End, Kyla Jaquish – Advancing Season Extension
J. S. Johnson Farms, Jim Johnson – Onion Thrips Scouting Project

Julia Shirk – Advancing Season Extension

K.S. Datthyn Farms, Ken Datthyn and Eric Tuttle – Evaluation of Fungicides for Control of BLB; Onion Thrips Scouting Project

Kirby's Farm Market, Chad Kirby – Advancing Season Extension

Kludt Brothers, Gary Kludt and Matt Kludt – SCBG Beet Project: Advisory Committee

Kreher's Poultry Farm, Michael Kreher, Brett Kreher, Vaughn Gingerich, Josh Jurs, and Peggy Francis – SCBG Beet Project: Advisory Committee

KULT Kress, Michael Smith – Field Day equipment and demo

L. Art Christensen Farm, Larry Christensen – Muck Carrot Weed Management; Sweet Corn Pheromone Trap Network

L-Brooke Farm, R. B. Glazier – SCBG Beet Project: Advisory Committee

Maple Lane Produce, Nelson Hoover – grafting and leaf mold trials

Maple Ridge, Phil Mommeson – Advancing Season Extension

Martens Organic Farm, Klaas Martens – Improving Soil Health; Organic Dry Bean Meeting host

Morgan Brothers Farm, Mark Morgan – Western Bean Cutworm Survey

Mortellaro & Sons, Matt Mortellaro — Onion Thrips Scouting Project; Potassium and Sodium Hypochlorite for Control of Bacterial Bulb Rot; Post-Emergent Herbicides for Control of Ragweed in Direct Seeded Onions; Evaluation of Selected Dip Treatments in Transplanted Onions; Pre-Emergent Herbicides in Direct Seeded Onions

Muddy Fingers, Liz and Matthew Martin – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health; Insect Exclusion Netting for Control of Swede Midge in Spring/Fall Broccoli

IN-KIND DONATIONS (continued)

My-T Acres, Peter Call and Jason Gaylord – SCBG Beet Project: Advisory Committee

Nathaniel Hoover – Advancing Season Extension

Native Offerings Farm, Stew and Deb Ritchie – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

Northern Orchards, Jesse Mulberry – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

 $\begin{tabular}{ll} \textbf{Obercreek Farm}-\textbf{BMPs} for Long Term Profitable High Tunnel Soil Fertility and Health \\ \end{tabular}$

Orleans County Soil & Water, Dennis Kirby – Field Day

Partridge's on the Farm Market, Donald and Patricia Partridge - CVP Demo Site

Porter Farm, Peter Metzler – Caps Tomato Survey

Quest Farm Produce, Denis and Bridget Reynolds – Swede Midge Plant Preference Study

R. L. Jeffres, James Barrett – SCBG Beet Project: Advisory Committee

Raindance Harvest – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

Rich Campanile – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

Robert Duyssen – Western Bean Cutworm Survey

Russell Farms, Peter Russell – Caps Tomato Survey

Rusty Plough, Oleh and Nadia Maczaj – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

S. J. Starowitz Farms, Steve Starowitz – Evaluation of Nitrogen Stabilizers in Summer Cabbage

Seedfolk City Farm, Lisa Barker – Advancing Season Extension

Seedway – seed for sweet corn trials

Seneca Foods, Jay Westfall and Jeff Johnson – SCBG Beet Project: Advisory Committee

Siegers Seed – seed for sweet corn trials

Slack Hollow Farm – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

Squash Blossom Farm, Jerimiah Pacheco – ethnic vegetable trial

The Berry Patch, Dale Riggs – Advancing Season Extension

Tim Blowers – Western Bean Cutworm Survey

Titus Shirk – tour for Principles of Vegetable Production class

Triple G Farms, Guy Smith – Onion Thrips Scouting Project; Potassium and Sodium Hypochlorite for Control of Bacterial Bulb Rot; Fungicide Timing on Control of SLB; Control of Perennial Sow Thistle with Stinger Herbicide Trial; Post-Emergent Control of Yellow Nutsedge Herbicide Trial

W. D. Henry & Sons, Dan Henry – Minimizing Wildlife Impact in Vegetables

W. D. Brawdy, Dennis Brawdy – Caps Tomato Survey

Wegmans Organic Research Farm, Drew Smith – BMPs for Long Term Profitable High Tunnel Soil Fertility and Health

Werner's Farm, Jeff Werner – Summer Vegetable and Cut Flower Meeting host Williams Farms, John Williams – Cornell Potato Variety Trial; meeting host Woodcrest, Jeff King – Advancing Season Extension



Research grants and projects managed by the Cornell Vegetable Program*



Dollars received in newly funded grants to support vegetable research in Western New York*



Farms and organizations offered land, labor, and supplies to support Cornell Vegetable Program research trials and events



Pounds of tomatoes and cucumbers harvested from Cornell Vegetable Program research plots and donated to Chautauqua County Rural Ministry's Gleaning Project, Dunkirk — used the vegetables in the preparation of meals for The Friendly Kitchen Soup Kitchen, and distributed through the Rural Ministry Food Pantry and The Salvation Army Food Pantry; Forestville Food Pantry, Forestville; and United Methodist 2 (UM2) Missionary, Batavia

CONTRIBUTIONS



BAAR Scientific, Chris Becker Bowman Farms, Larry Bowman

Gianetto Farms, Nick Gianetto

Henry W. Agle & Sons, James and William Agle

John R. Wallace Farms, John Wallace

Kreher's Poultry Farm, Brett Kreher

Kwilos Bros. Farm, Joseph and Rick Kwilos

Quest Farm Produce, Denis and Bridget Reynolds

Reeves Farms, Mark Reeves

Reukouf Farm, Charles Reukouf

Root Brothers Farms, Robin L. and R. Scott Root

Rose Valley Farm, David Stern

Sorbello & Sons, Inc., Dana Sorbello

Vacco Farms, Carmen Vacco

Weiss Farms, Anthony Weiss

Woody Acres, Dave Woodward

Your Local Produce Connection, Adam Buzzard

* some are multi-year projects

To make a donation to support the Cornell Vegetable Program, visit HTTP://CVP.CCE.CORNELL.EDU/DONATION_INVOICE_PAYMENT.PHP



Cornell Cooperative Extension regional Vegetable Specialists work together with Cornell faculty and Extension Educators statewide to address the issues that impact the New York vegetable industry. The regional teams offer educational programs and information to growers, processors and agribusiness professionals.

PRODUCE AND MARKET SAFE AND HEALTHFUL CROPS











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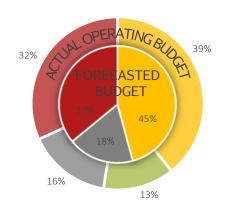
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AMY CELENTANO, JOHN GIBBONS, CORDELIA HALL, and MARIAM TALEB, Program Assistants ANGELA PARR, Administrative & Communications Lead

2016 OPERATING BUDGET



Supporting County Association Shares, \$261,466

Cornell University Federal Funds¹, \$128,000

Cornell Vegetable Program Grants and Funds², \$323,065

In-Kind Contributions, \$109,922

¹ USDA National Institute of Food and Agriculture Smith Lever Funds

² Includes funds from industry, state and federal grants, event registrations, sponsor support, and Cornell Vegetable Program reserve accounts



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