
CASE STUDY: RIO GRANDE COMMUNITY FARM

Agricultural Setting Scenario and Brief History:

MLRA 42: Urban organic and community garden vegetable production. Rio Grande Community Farm (RGCF) is a non-profit 501(c)3 organization located in Albuquerque, NM. The 138-acre farm is owned by the City of Albuquerque’s Open Space Division. The City acquired the land in 1995 after passing a two-year ¼ cent sales tax to provide funds for its acquisition. RGCF was founded in 1997 and undertook management of the farm. The farm occupies the original site of Los Poblanos, one of the earliest Spanish Colonial settlements in the Rio Grande Valley. It is a living link in an agricultural heritage that extends over 1700 years, making it among the oldest parcels of continually farmed land in the United States.

Farm Objectives:

- **To use a working farm to demonstrate sustainable urban agriculture.**
  Self-funded, market driven, organic farming operation with several full time farmers, field workers and support staff.

- **Enhance urban wildlife habitat.**
  Continue to plant wildlife crops while maintaining and enhancing wildlife habitats. Partnerships created with other wildlife organizations. Wildlife education provided for public awareness and natural environment appreciation.

- **Research and interpret the relationships between people, food, and public land.**
  Funding for research provided to study relationships and hold conference to share results.

- **Create education and training opportunities in agriculture.**
  Cooperative pool of labor with other farms created and utilized. Partnerships formed with schools, churches, seniors and other community organizations. Interns supported and sponsored. Service learning programs part of farm operation.

- **Celebrate the traditions and culture of agriculture.**
  Learn and teach local farming practices, participate in saving of heritage seeds, host two major events per year, provide appreciation events for members, funders, volunteers, maintain the acequias and participate in community events sponsored by other organizations.

Current Operations include:

- Operate greenhouse for starting crops and plants for sale.
- Coordinates the annual Maize Maze which is open to the public.
- Organizes a community garden with over 100 participating members and groups.
- Grows field crops and flowers for sale.
- Gives tours of farm to school and community groups.
Case Study: Rio Grande Community Farm

- Plants several acres in grains and seed crops for migrating flocks of birds.
- Maintains soil enriching and erosion preventing cover crops on field acreage.
- Maintains a Heritage Seed program.
- Provides organic vegetables for Albuquerque Public Schools food program.

Subsurface Drip Irrigation (SDI) Project:
The RGCF has received two-year (10/2009-10/2011) funding through the USDA Natural Resources Conservation Service Conservation Innovations Grant programs to partially fund a subsurface drip irrigation system project on 16 acres. Other agencies collaborating on this project include: City of Albuquerque Open Space Division, New Mexico Organic Commodities Commission, New Mexico State University Extension Service, and New Mexico Department of Agriculture. This project is at the cutting edge of irrigation on-farm research/demonstration. The system consists of subsurface drip irrigation (SDI) operated in a manner consistent with the USDA National Organic Program. The project purpose is to demonstrate that two well established agricultural systems – SDI and certified organic – can be combined to produce an optimum growing system that conserves water, results in high yields and enhances soil and environment. Already installed on the 16-acre field and funded through EQIP, is the SDI system, consisting of permanently buried drip tape that is organized into 36 ft. wide beds separated by an 8 ft. drive path. There are 7 zones allowing growth of 7 (or more) different crop rotations. Project deliverables include: a monograph and other publications on organic SDI; detailed data on water usage by crop and zone; presentations at a New Mexico and National conference; highly detailed growing protocols that outline procedures for specific crops that articulate the organic and SDI processes followed; a roadmap of organic field solutions for traditional SDI problems. The project will document the process of: maintaining traditional organic techniques of soil improvement while using SDI, preserving the integrity of buried drip tape using organic methods, maximizing the SDI system for fertilizing crops using drip tape (fertigation), and maintaining water quality.

Location and Contact Info:
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Acres Farmed:
138

Crops:
Organic Vegetables
Site Description:

RGCF grows organic vegetables in the Rio Grande Valley. RGCF has been farming in this valley for 15 years.

Albuquerque lies within the northern, northern reach of the Chihuahuan Desert Ecoregion, Major Land Resource Area 42-Southern Desertic Basins, Plains, and Mountains.

The New Mexico portion of the Rio Grande lies within the Rio Grande Rift Valley, bordered by a system of faults, including those that lifted up the adjacent Sandia and Manzano Mountains, while lowering the area where the Rio Grande now flows. The top 75 feet (23 m.) of the floodplain consists of recent alluvial fill from the Rio Grande; below that is much older fill of the Santa Fe Formation. The Rio Grande is a braided, slightly meandering river which flows at an elevation above the floodplain. Drainage in the latter is largely internal, or by man-made ditches. The river is fed mainly by melt water from the northern New Mexico mountains. The floodplain proper receives flow from the local arroyos; flooding now being brought under control by diversions and holding ponds in the "Valley Sides" unit. Ground water is very shallow, fed by river seepage and percolation of irrigation water; the latter is diverted in large amounts from the Rio Grande. Alluvium forms an upper aquifer up to 120 feet (37 m.) thick; water is hard and frequently polluted. City wells in the Santa Fe Formation below obtain abundant water of good quality. Numerous domestic, commercial and irrigation wells also occur and local draw down effects are pronounced.

Albuquerque's climate is classified as arid, meaning average annual precipitation is less than half of evaporation, and the mean temperature of the coldest month is above freezing (32F). Albuquerque's climate is usually sunny and dry, with low relative humidity. Brilliant sunshine defines the region, averaging more than 300 days a year; periods of variably mid and high-level cloudiness temper the sun at other times. Extended cloudiness is rare. The city has four distinct seasons, but the heat and cold are mild compared to the extremes that occur more commonly in other parts of the country. Valley and west mesa areas, farther from the mountains are drier, averaging 6–8 inches of annual precipitation. Most precipitation occurs during the summer monsoon season, typically starting in early July and ending in mid-September.

Winters are rather brief but definite; daytime highs range from the mid 40s to upper 50s Fahrenheit, while the overnight lows drop into the low 20s to near 30 by sunrise. Spring time starts off windy and cool, sometimes unsettled with some rain and even light snow, though spring is usually the driest part of the year in Albuquerque. March and April tend to see many days with the wind blowing at 20 to 30 mph, and afternoon gusts can produce periods of blowing sand and dust. In May, the winds tend to subside, as temperatures start to feel like summer. Summer daytime highs range from the upper 80s to the upper 90's, while dropping into the low 60s to low 70s overnight. Fall sees mild days and cool nights with less rain, though the weather can be more unsettled closer to winter. Frost free days average 165-185 days, approximately April 13 to October 28.

The soils on RGCF are primarily Gila clay loams, Agua silty clay loams, Gila loams, and Agua loams which are level to gently sloping, well drained loams of the Rio Grande floodplain (USDA-NRCS, Soil Survey of Bernalillo County, Parts of Sandoval and Valencia Counties, NM, 1977). The fields have been laser leveled. Potential limitations are moderate to very high wind erosion potential, high water table, seepage, flooding, and salinity.
Sustainable Agriculture Issues:

ENVIRONMENTAL QUALITY & ECOLOGICAL FUNCTION
Soil, Water, and Climate Constraints
Nutrient Cycling
Pest Management
SOCIOECONOMIC VIABILITY
Volatile Markets; Uncertain Yields
Social Acceptance

ENVIRONMENTAL QUALITY AND ECOLOGICAL FUNCTION

Soil, Water, and Climate Constraints:
RGCF anticipates using precision placement of drip lines in furrows with seed placement close to drip line vs. flood irrigation will provide a water conservation factor between 10 and 15, i.e. currently flood irrigation uses 4000 gpm ditch water per unit of field crops. The number is anticipated to drop to 200-400 gpm of water use with the drip system. Besides tremendous savings in water usage, a precision drip line system will allow crop diversification within the field. Drip lines controlled by valves give the operator wide latitude in which rows to water, when, and how much. Currently with flood irrigation, the only control is by creating berms that contain flood water – a gross control at best. A third benefit is the ability to eliminate harmful weed seeds and other debris that currently arrives in the ditch water, creating crop pressure and competition for nutrients. A fourth benefit will be to add nutrients systematically through “precision application” and other injectible inputs through the distribution lines. Using specially designed low impact tillage equipment that will disturb the soil only within the first 2-3 inches of the grade level, earthworms and other soil organisms will be able to thrive.

Building ecological biodiversity above and below ground is a definite part of the strategic plan. RGCF maintains cover crop on all of the fields, protecting the soil from wind erosion and building soil quality. Side dressing of rows with organic compost, mulching with organic hay, and applications of compost teas will also be demonstrated on the subsurface drip project.

The soils and low rainfall at RGCF require irrigation. Improper irrigation water management can promote diseases that can lead to significant yield reductions. Salinity is also a concern. RGCF subsurface drip irrigation system allows more accurate control of the water each bed receives. Thus RGCF can ensure enough water in the summer to prevent stress but not so much that it promotes fungal disease. By managing water use more carefully, RGCF also reduces the potential for nitrate leaching and the probability of salinity problems that can reduce yield and crop quality. RGCF plans to monitor salinity and to water by flood irrigation when needed to obtain the appropriate leaching fraction.

RGCF has noted that soil fertility is improving over time. Active carbon tests have been taken. Organic matter in the soil has increased since a permanent cover crop has been maintained. There has been a dramatic change in surface soil color, and the soil structure has changed over time from massive to granular. Even the cover crops are looking healthier. Achieving better residue management with organic crops will be targeted in the near future.
Nutrient Cycling:

Soil and irrigation water samples are taken and analyzed prior to application of nutrients. RGCF fields receive nutrients which are compatible with the National Organic Plan and with the nutrient budget. Irrigation water, legume cover crops, and other organic nutrient sources are all figured into the budget. Supplemental micronutrients are foliar applied according to foliar tissue tests and recommendations.

RGCF maintains cover crops, consisting largely of annual grains (rye, oats, wheat) and legumes (vetches and clovers), on all of the fields. These serve a variety of functions, including erosion control, pest management, moisture retention, and nutrient cycling. The vetches and clovers also enhance the nitrogen status of the soil. RGCF estimates the water and nutrients provided to the cover crop this year will be returned to crops in the following year in the form of soil organic carbon and recycled nutrients.
Pest Control (Insects, Rodents, Weeds):
RGCF grows a diverse set of crops, including rye, alfalfa, corn and oats. These crops harbor different kinds of insects, helping keep the insect population in balance, a key to RGCF’s pest management strategy.

RGCF believes that in addition to monitoring insect pest levels to determine when control measures will be needed, farmers should cultivate and monitor beneficial insect and animal habitat and they will keep insect pests in check. RGCF has a Field of Dreams philosophy: “build it and they will come.” The multi-species cover crop is primarily insect habitat. They are also working with NRCS to strategically install insectary plants (plants that provide habitat for insects) around the farm. To control rodents, RGCF has installed owl boxes. However, the farm is not pest-free. You have to live with some pests to make the system work. The beneficial predators would not stay around if all the pests were gone.

According to RGCF, organic farmers have no weeds, they have native vegetation. Some kinds of vegetation are less desirable than others, but the cover crops control these fairly well. RGCF does not mind the extra water and nutrients needed to maintain the cover crop, since they are eventually recycled into the crop or the soil organic matter.

SOCIOECONOMIC VIABILITY

Uncertain Yields; Volatile Markets:
RGCF has cornered a niche market for organic vegetable, which helps stabilize cash flow. RGCF admits that the restrictions placed by organic certification can sometimes reduce yields, but in the long term, the price differential between organic and conventional more than compensates.

Social Acceptance:
Urban encroachment into farmlands is occurring throughout the United States but is also apparent in New Mexico. People living near agricultural land often fear the use of agricultural chemicals, are disturbed by odors and noises, and are irritated by slow-moving farm machinery on the roads. Urban populations need to understand the constraints under which farmers operate. Conversely, farmers need to understand the concerns of the urban population. Some farmers have found that selling their products directly to local consumers through farmers markets or other means can help them understand where food comes from. It can also increase net farm income by eliminating the “middle”. The RGCF is farming organically and hopes to reduce tillage as they become more sustainable. They have used innovative approaches of involving the community at all phases through community gardens, providing tours to public and school groups, educational events. They provide organic vegetables for Albuquerque Public Schools food program. Also, a “brain trust” or interdisciplinary, interagency, producer/community advisory group has been formed. RGCF serves as a model for obtaining social acceptability in urban environments.
Case Study: Rio Grande Community Farm

Harvesting sunflowers

蒜瓣植种在农场-十一月，2007

一个由RGCF的教育/外展协调员组织的许多教育活动之一
Rio Grande Community Farms (RGCF) makes its first delivery of produce to Albuquerque Public Schools!

August 21, 2008. Pictured from left to right: Joan Quinn, RGCF Heritage Board Member; State Senator Dede Feldman, Heritage Board Member and sponsor of legislation appropriating funds to buy locally grown produce; Steve Carleton, APS Food Services Supervisor; Stephanie Dobbie, current RGCF Board Member, Minor Morgan, RGCF Treasurer; Marcia Walton, RGCF Staff.