



Weathering the Storm: A Guide to Preparing for Disaster and Finding Disaster Assistance for your Farm or Ranch

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Published August 2021
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IP613

Planning for the worst means being ready in the event that disaster strikes. This publication explains disaster declarations and briefly discusses federal disaster assistance programs. It describes how recordkeeping, risk management, and insurance can help farmers be prepared for disasters, and it explores how environmental, social, and financial resilience can help agricultural producers mitigate and survive disasters.

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Flooding in newly planted almond orchard in California. Photo: Rex Dufour, NCAT

Agriculture is an economic and social bedrock of the United States, yet for decades, farmers, ranchers, and farmworkers have endured growing challenges that increase their levels of stress. The **Farm and Ranch Stress Assistance Network Northeast (FRSAN-NE)** aims to improve behavioral health awareness, literacy, access, and outcomes for farmers, ranchers, and farmworkers in the Northeast by developing a service provider network that can assist and meet the unique needs of agricultural workers. FRSAN-NE Network members developed a Resource Working Group to focus specifically on providing information and materials designed to inform those who interact with this population. The resources provided here were created to provide information needed by those who want to offer support, but don't have expertise in the mental health profession. *This work is supported by the USDA National Institute of Food and Agriculture, Farm and Ranch Stress Assistance Network (FRSAN) project 2019-70028-30464 and 2020-70028-32729.*

This publication is produced by the National Center for Appropriate Technology through the ATTRA Sustainable Agriculture program, under a cooperative agreement with USDA Rural Development.  ATTRA.NCAT.ORG.

Introduction

Even on a good day, agriculture is a tough career. Whether you are waking up before dawn to care for animals, working under a hot sun to cultivate plants, or staying up late to make the budget work, the day-to-day reality of a farming or ranching life is a difficult path. When disaster strikes, it can overload your already stressed system. By investing a little time planning for the worst and learning where you can get support, you will be more ready to respond to any situation.

Planning for the worst means being ready in the event that disaster strikes. It means doing your homework and taking those added steps during the off-season when there is a little extra time. It includes the following strategies:

- Keeping diligent records of your farm operations,
- Working on written risk management assessments and farm safety plans,
- Knowing what disaster-relief agencies will need, so you can have the information on hand,
- Having the right kind of insurance for your farm, and
- Investing in the environmental health of your farm.

Knowing where you can get support is more complicated. Assistance in disaster situations often depends on the disaster. Although some agencies and non-profit organizations have blanket disaster assistance programs, assistance is usually specific to particular disasters. This publication will review resources from the United States Department of Agriculture (USDA), other federal agencies, and non-profit organizations.

Disaster Declarations and Disaster Assistance

Getting help during a disaster does not begin when the hurricane hits or the fires come through, but, rather, when an official in a position of power makes a disaster declaration.

At the national level, the President of the United States declares disasters. The Federal Emergency Management Agency (or FEMA) describes this process on its website “How a Disaster Gets Declared.” The basic process is that a Governor

from an affected state must request the declaration from the President and show how the disaster exceeds the state’s capacity to respond. This process also applies to U.S. Territories, such as the District of Columbia, Puerto Rico, and U.S. island territories. Federally recognized Indian tribal governments also have the right to request disaster declarations (FEMA, 2020).

At local levels, any level of municipality can declare a disaster, such as a city or town, county, or state, and each municipality has different rules and processes for doing so. Disasters are usually declared after the fact, but some governments allow for them to be declared if disaster is “imminent” (Parker, LLP, 2020).

Examples of Disasters

The following is an incomplete list of incident types for which state and federal agencies and governments can declare a disaster:

- Biological
- Chemical
- Coastal Storm
- Dam/Levee Break
- Drought
- Earthquake
- Fire
- Fishing Losses
- Flood
- Freezing
- Human Cause
- Hurricane
- Mud/Landslide
- Severe Ice Storm
- Severe Storm(s)
- Snow
- Terrorist
- Tornado
- Toxic Substance
- Tsunami
- Typhoon
- Volcano

Source: <https://www.fema.gov/disasters/disaster-declarations>

Related FRSAN-NE Resources

I’m a Farmer. When Do I Need a Lawyer?

Farm Stress and Emotional Well-Being

Helping Farmers in Financial Crisis

There are two main types of disaster declaration: “Major Disaster” and “Emergency.” Declaring a Major Disaster is a way for a government to say that it does not have the capacity to respond to the disaster and that it will need long-term assistance. An Emergency Disaster is something that only requires short-term help.

In either case, the declaration gives a government powers to respond to the disaster: evacuations, suspending of regulations, quarantining, etc. For the purposes of the discussion here, a disaster declaration opens the power to offer financial assistance to recovery projects (Parker, LLP, 2020).

USDA Disaster Assistance

The USDA has its own process for declaring agricultural-related disasters, which mimics the process stated above but ends at the Secretary of Agriculture instead of the President. And, instead of offering diverse powers, an agriculture-related disaster is generally limited to the power of offering emergency loans. USDA’s Farm Service Agency (FSA) has a complete Fact Sheet about this on its website, which is briefly summarized here.

USDA FSA administers two types of disaster declarations: those declared by the Secretary of Agriculture and those declared by the President of the United States (both major and emergency disasters). In addition, the FSA manages the following specific disaster declarations:

- FSA Administrator’s Physical Loss Notification (APLN), and
- Quarantine designation under the Plant Protection Act and animal quarantine laws.

These latter two are specific to FSA and need to be requested by FSA State Executive Directors. The APLN offers assistance when there has been destruction of physical infrastructure and livestock, say, in the event of a tornado. Quarantine assistance is designed to offset losses from quarantines.

In all cases, FSA offers assistance in the form of Emergency (EM) Loans to help farmers and ranchers weather the disaster (Farm Service Agency, 2020).

Other Federal Disaster Assistance Resources

FEMA

The Federal Emergency Management Agency (FEMA) was established under President Jimmy Carter and was moved under into the Department of Homeland Security in 2003. FEMA is often the central hub during and just after disasters, with other agencies connecting with FEMA. FEMA is not solely concerned about agriculture the way USDA is, but it still offers many resources that may be available to you.

FEMA manages the website www.disasterassistance.gov that allows you to discover in a few clicks exactly what assistance is available to you in your town, city, or county and for what disaster.

Also note: FEMA is the *federal* disaster agency. Your state, territory, or tribe may have a more local agency as well.

Small Business Administration

The U.S. Small Business Administration (SBA) is an independent federal agency that helps people in the United States start, build, and grow their businesses. In the event of a disaster, it can also be a source of low-interest disaster loans. An SBA loan can be used to cover losses and business expenses. More information is available on the website www.sba.gov/funding-programs/disaster-assistance.

Environmental Protection Agency

The U.S. Environmental Protection Agency (EPA) can be involved in both the response to disaster (consider something like an oil spill) and the recovery from that disaster. More often, however, they work to build up a community’s preparedness so that future disasters are minimized. For more information on the EPA’s role in disaster assistance, visit www.epa.gov/homeland-security/epas-role-disaster-recovery

Internal Revenue Service

One often-overlooked part of government assistance in disasters is the Internal Revenue Service (IRS). The IRS publishes a Disaster Resource Guide (publication 2194) offering a

A disaster declaration opens the power to offer financial assistance to recovery projects. (Parker, LLP, 2020)

reminder that losses incurred during a disaster may be tax deductible. It also directs readers to tax assistance centers and provides information about what records need to be saved. www.irs.gov/pub/irs-pdf/p2194.pdf.

Disaster Resilience and Preparedness

Having reviewed how the federal government can come to a farmer's or rancher's aid after a disaster, we need to look at how to be prepared before a disaster strikes. This section will cover five topics:

- Keeping good records and knowing what records are important for disaster relief agencies,
- Risk management assessments and farm safety plans,
- Having the right kind of insurance for your farm or ranch,
- Investing in the environmental resilience of your farm or ranch, and
- How financial diversity can keep a business afloat.

Recordkeeping in Case of Disasters

Recordkeeping is a crucial and often overlooked part of farming – as it is for many small businesses. However, in the event of disaster, your records will serve as a guide for what you had before everything went sour, and they may make you eligible for different kinds of assistance. In some cases, they will be required. In other cases, having good, accessible records may speed up application processes that are often bureaucratic.

The Rural Advancement Foundation International (RAFI) provides a three-page overview of the kinds of records you should be keeping in order to document losses during a disaster, aptly called *Documenting Disaster Losses*, by Scott Marlow. As Marlow puts it: “The better the documentation, the more likely that a producer will be able to receive assistance for their recovery” (Marlow, No Date).

Disaster-assistance programs will need to know three things from you:

1. The value of the farm or ranch before the disaster,
2. The value of the farm or ranch after the disaster, and
3. The extra costs incurred to recover the farm.

Marlow writes: “As soon as the emergency is over and people and animals are safe, the farmer [or rancher] should begin documenting the loss. It is critical that all damage is documented *before recovery efforts take place*. Use the camera before the chain saw!” (Marlow, No date).

One piece of advice is to have a blank notebook on the farm, specifically to be pulled out in the event of a disaster. Use that one notebook for all

Recordkeeping 101

You should be able to find information on how to keep farm records from your preferred technical assistance provider, such as your local Extension office. This is a quick overview of what keeping records for your farm means. For more information, you can check out ATTRA's lesson on “Record Keeping and Invoicing” that's part of the *Scaling Up for Regional Markets* tutorial on the ATTRA Tutorials webpage.

Recordkeeping helps you keep tabs on the pulse of your farm and helps you understand whether you are meeting the goals you set for yourself, staying profitable, and complying with tax laws. There are three kinds of records that are important to keep: financial records, marketing records, and production records. There are myriad techniques and tools to keep these records, from a small notebook in a back pocket to custom-built cloud-based management software. The trick is to find a method that you, the farmer or rancher, will actually use.

A couple of tips:

- Keep personal and business records separate. In the event of disaster, you and your farm or ranch will likely be treated as separate entities.
- Keep up to date. You do not want to be fumbling with a two-month hole in your records days after a flood has washed away your fields.

Some recordkeeping resources:

- *The Organic Farmer's Business Handbook*, by Richard Wiswall
- *Fearless Farm Finances*, published by MOSES
- ATTRA publications and tutorials, such as these:
 - *Basic Accounting: Guidance for Beginning Farmers*
 - *Beginning Farmer Tutorial*

One piece of advice is to have a blank notebook on the farm, specifically to be pulled out in the event of a disaster.

your notes after the disaster. That way, everything will be in one place and not on sticky notes spread around in the breeze.

To establish pre-disaster value, you can refer to your financial, marketing, and production records. If you have a sound recordkeeping practice, you will have your tax records, your credit card bills, information on what you spent on inputs, your sales records, and more. You can also use records from these sources:

- Your lenders (or lenders you applied to), who will have asked about the value of everything they could use as collateral for the loan and would have that information on file;
- Your insurance providers, who you'll likely be talking to anyway, will have information on property, vehicles, and, if you have crop insurance, your crops;
- The Farm Service Agency (FSA), if you have an established relationship with them; and
- The Natural Resources Conservation Service (NRCS) if you have applied for conservation assistance through them.

After a disaster, you will likely have an agent of your insurance come out to evaluate the damage and/or you will get a visit from an agent of the federal government. Be sure to review any evaluation these officials do to assure its accuracy. Bring in experienced third parties, such as your veterinarian or your local Extension agent, if the value on the evaluation does not match the value

Where to Keep Records?

In a disaster, your records won't be useful if you cannot get to them. As with all important information, keep your records backed up and in multiple locations.

- **Physical copies:** backup copies of your records should be kept separate from your originals. Keep them on a different part of the property, or (if possible) keep backups off-site.
- **Cloud-based** (online) records can be a great way to store information, as the cloud can be accessed anywhere with an Internet connection. But the cloud should not be the only storage space for your information. If the power goes out or the cell tower comes down, you will not be able to access your information. Keep print copies in reserve.

you expect. Again, a strong habit of recordkeeping can show the value of what has been lost.

Continue keeping records throughout the recovery. Depending on where assistance is coming from, time and money you spend on tools you rent to dig yourself out, both figuratively and literally, can be reimbursed. There is also specific disaster unemployment assistance to reimburse you for the time you spend in disaster recovery and not actively working your farm or ranch.

As the old saying goes: an ounce of prevention is worth a pound of cure. Good recordkeeping practices will be worth literal money as you pull through a disaster.

Risk Management Assessments and Farm Safety Plans

Recordkeeping is good for knowing where the farm or ranch has been and what its current situation is regarding disasters. Risk Management Assessments let you pull back the curtain on the future and understand what kind of situation your farm could experience in the event of a disaster. The New England Small Farm Institute created a basic assessment that you can work through when you have the time. You can find it on the website www.smallfarm.org and at this direct link: <http://www.smallfarm.org/uploads/uploads/Files/risk.pdf>. The authors recommend running through the assessment every year or two to account for the most recent changes to your farm or ranch.

The assessment covers five areas of farm and ranch operations and asks the user to rank the risks on a scale of low-medium-high:

1. Risks to Production
2. Marketing and Market Risks
3. Financial Risks
4. Legal and Environmental Risks
5. Risk to the Human Resources

For any point that you rank as a high-risk activity, the assessment prompts you to consider strategies to reduce the risk.

A risk assessment, therefore, does not need to be a time-intensive, major undertaking. Rather, it is a way of reflecting on the condition of the farm or ranch.

Another useful tool for risk management is the more detailed "Risk Management Checklist"

from the USDA's Risk Management Agency (RMA). It can be found on the RMA website at www.rma.usda.gov/en/Topics/Manage-Your-Farm-Risk. This document goes into more detail than the document from the New England Small Farm Institute. For every item on the list that you cannot positively check off, take some time and fill in the blank. For example, to cover risks in the category of Marketing, the checklist asks if you have reviewed new marketing opportunities in the last six months. If you have not, maybe it is time to touch base with some technical assistance in marketing.

After a risk management assessment, creating a farm safety plan can prepare your farm against the unknown. Like a food safety plan, a farm safety plan puts in writing the assessment and the mitigations that your farm or ranch takes against risk. Penn State's publication *Safety and Health Management Planning for General Farm and Ranch Operations* is a detailed resource that walks you through all the pieces of a farm safety plan:

1. Establishing Safety Procedures
2. Identifying and Assessing Hazards and Risks
3. Mitigating Hazards and Risks
4. Educating Employees
5. Evaluating the Safety Program

The publication includes a variety of safety checklists that – if you go through them regularly – can show where issues might arise. It also provides different ways of assessing risk that are more sophisticated than the low-medium-high system presented by the New England Small Farm Institute.

The Penn State publication walks farmers and ranchers through ways they can mitigate risk and ways they can educate everyone working on the farm. Assuring that all tractors on the ranch are equipped with a Rollover Protection System may not seem like a big deal, but it does help a farm avert a potentially business-ending financial and legal disaster should an employee be seriously injured or killed.

Insurance for Your Farm

Disaster assistance can be a valuable way to recover from the worst, but it often comes in the form of loans that need to be repaid. Assistance

cannot necessarily replace insurance for your crops, business, or personal belongings. Having an insurance policy for your farm can make the difference between closing up shop and weathering the storm.

The USDA's Risk Management Agency (RMA) manages and administers federally subsidized crop- and livestock-insurance products in the United States. That means that they set the terms and private companies sell the product to the farming or ranching customer. Federal crop insurance policies cover three categories: major-commodity crops (such as corn, soybeans, wheat, rice, and cotton), specialty crops (such as fruits and nuts, vegetables, and horticultural and nursery crops), and livestock. These federally subsidized insurance products cover disasters and market fluctuations. Coverage of market fluctuations is called revenue insurance. Not all disasters are akin to hurricanes. The COVID-19 pandemic, for example has hit market channels harder than it hit actual production in the fields.

Crop insurance for specific crops is traditionally available at a county-by-county level. So, if you live in a wheat-producing county, you should be able to purchase a crop insurance plan for your wheat. For an understanding of what is available to you, you will need to talk to a crop insurance agent. A list of these agents can be found on the USDA RMA website (see sidebar, next page).

Here in the Northeast, farmers and ranchers have historically been poor users of crop insurance – and for good reason. The traits that make farming in the Northeast special, like traditional growing techniques, small farms, and diversified crop production, make buying into insurance plans designed for large-scale commodity growing difficult at best.

The USDA RMA, recognizing the value in small-scale, diversified farming, developed a program called Whole Farm Revenue Protection (WFRP). Instead of insuring specific crops, it insures the revenue of the entire farm. For example, if a farm brought in roughly \$500,000 in revenue for the last five years, but year six – because of a disaster – only brought in \$200,000, the WFRP program would kick in and provide the insured farmer with a portion of the \$300,000 difference.

Another program that fits more with traditional Northeast agriculture is the Noninsured Crop Disaster Assistance Program (NAP) offered

not by RMA, but by FSA. NAP provides risk protection for crops that are not covered by more traditional single-crop insurance plans. For example, tomatoes are not a commodity crop, but a farmer can purchase a plan through the FSA to cover the tomato harvest. NAP will also cover individual crops that would be covered in a different county; remember, crop insurance is available by county. So, if you grow dry-land wheat in Massachusetts, you would not qualify for commodity crop insurance. You would, however, be able to connect with your local FSA agent and get a NAP plan to cover your wheat.

As with most insurance plans, the more you pay, the more you get. The higher your premiums, the more you can expect from the insurance agency in the event of disaster.

For more information on crop insurance, talk to your local USDA FSA office: <https://offices.sc.egov.usda.gov/locator/app>. Also, speak with

a crop insurance agent. A list of agents can be found on the USDA RMA website: www.rma.usda.gov/Information-Tools/Agent-Locator-Page. The ATTRA Sustainable Agriculture Program offers assistance regarding crop insurance options and which of them can work for you and your farm. Call 800-346-9140 or write askanag@ncat.org to learn more. See also these two publications:

- *Crop Insurance Options for Specialty, Diversified, and Organic Farmers* <https://attra.ncat.org/product/crop-insurance-options-for-specialty-diversified-and-organic-farmers>
- *Noninsured Crop Disaster Assistance Program and Whole-Farm Revenue Protection: Understanding the Differences* <https://attra.ncat.org/product/noninsured-crop-disaster-assistance-program-and-whole-farm-revenue-protection-understanding-the-differences>

USDA Risk Management Agency (RMA)

rma.usda.gov

This site is an excellent resource for all RMA programs, specific policies, programs, and general risk-management tools. The following are some important links within the website:

- **Policies:** www.rma.usda.gov/policies A basic description of policy types.
- **Map Viewer:** <https://prodwebnlb.rma.usda.gov/apps/MapView/index.html> Maps detailing policies that are offered in particular counties.
- **Cost Estimator:** <https://ewebapp.rma.usda.gov/apps/costestimator> Premium-cost estimator for all policies.
- **Agent Locator List:** www.rma.usda.gov/en/Information-Tools/Agent-Locator-Page Crop-insurance agent locator.
- **Whole-Farm Revenue Protection Program:**
 - www.rma.usda.gov/en/Policy-and-Procedure/Insurance-Plans/Whole-Farm-Revenue-Protection Fact sheets, FAQ, and handbook for the program.
 - Livestock: www.rma.usda.gov/en/Topics/Livestock Descriptions of the different livestock insurance policies available.

Environmental Resilience

One of a farmer's or rancher's allies during and after a disaster can be the healthy and functioning ecosystem on which the operation is built. Having a farm that works with the natural processes of the environment—instead of against them-- helps the land itself absorb the brunt of many disasters and helps speed up the return to normalcy afterward. This section will briefly describe how good soil health can help mitigate many natural disasters and explain how diverse cropping systems and management-intensive livestock systems can build that good soil health. In short, sustainable and regenerative agricultural techniques are ways to improve a farm's disaster preparedness.

Soil Health

One of the foundational sources for information on soil health in the United States is the USDA's Natural Resources Conservation Service (NRCS). The NRCS works to help farmers and ranchers improve their land and is descended from government agencies that responded to the over-farming of Oklahoma and the Dust Bowl of the 1930s. NRCS defines soil health as "the continued capacity of soil to function as a vital living ecosystem that sustains plants, animals, and humans." (NRCS, 2020)

When soil is healthy, it functions like an organism itself, taking in nutrients, self-regulating, and serving as a host to billions of microorganisms.

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Healthy soil serves five essential functions for agriculture:

- Regulating water – The healthier the soil, the more capacity it has for absorbing and retaining water. That means ability to withstand drought longer and absorb water in a flood.
- Sustaining plant and animal life – Healthy soil can support more life, for longer, which allows for more flexibility.
- Filtering and buffering potential pollutants – Oil spills and toxic waste events—or even over-application of fertilizers and pesticides—are devastating to the natural environment, but a healthy soil will be able to filter out what it needs.
- Cycling nutrients – Many vital nutrients for farm and ranch health, such as nitrogen and phosphorus, cycle through and can be stored in the soil for a “rainy day.”
- Physical stability and support – In flooding, wind, or rain, a healthy, well-structured soil will help hold up more crops and buildings than an overused or abused soil.

All of this information, and more, can be found on the NRCS Soil Health Site: www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health or by contacting your local NRCS office.

For more information about soil health, you can also contact specialists working with the ATTRA Sustainable Agriculture program at askanag@ncat.org. Refer as well, to the following ATTRA publications and webinars:

- *Soil Health Principles* Webinar: <https://attra.ncat.org/soil-health-principles-webinar/>
- *Managing Soils for Water: How Five Principles of Soil Health Support Water Infiltration and Storage*: <https://attra.ncat.org/product/manage-soil-for-water/>
- *Building Healthy Pasture Soils*: <https://attra.ncat.org/product/building-healthy-pasture-soils>
- *Nutrient Cycling in Pastures*: <https://attra.ncat.org/product/nutrient-cycling-in-pastures>
- *Soil Health and Livestock*: ATTRA Resources: <https://attra.ncat.org/product/soil-health-and-livestock-attra-resources>

Diverse Cropping Systems

Sustainable agriculture takes much of its lead from the natural flows of wild ecosystems such as, say, a forest or prairie. Without human interference, these systems are rich with a diversity of species existing in mutually beneficial relationships. Nutrients cycle through the system so that the waste of one organism is the food for another. Because nature dislikes a vacuum, every resource available becomes an input for a different kind of organism and mapping it all out becomes an exercise in futility. The whole system exists in a constantly shifting equilibrium.

Mimicking natural processes makes your farming system more complex and the implications of this are still being studied in universities and agricultural research institutions around the world. What is known is that diversity in your cropping improves the availability of nutrients for your crops, enriches the soil, and makes your entire system more resilient to shocks such as drought, flood, heat, and cold.

More and more, farmers around the country are including cover crops in their farming systems. The basic idea is that the soil should never be left bare. Although it may be counterintuitive to grow more plants during an off-season, cover crops provide ground cover and reduce soil loss to wind and water erosion. Cover crops can reduce evaporation of moisture from the soil. Many cover crops, especially the leguminous crops, fix more nitrogen into the soil. Cover crops can also play a role in reducing weed, insect, and disease pressure.

Cover Crops: Moisture Use

While cover crops seem to be becoming a more common practice in the Northeast United States, for readers in the rest of the world cover crops come with one significant drawback: they consume moisture from the soil. In arid places where soil moisture is held at a premium, the use of cover crops becomes more complicated. Soils that are not covered lose a lot of moisture to evaporation as the sun heats them up. Cover crops can increase water infiltration, i.e., move the water deeper into the soil so that it is less likely to evaporate, but those same cover crops will transpire the moisture they use into the air. In your location, it may be necessary to irrigate cover crops. Is that something you would be able to afford?

Before sowing your fields with cover crops, connect with a local resource such as a university Extension program.

Although it may be counter-intuitive to grow more plants during an off-season, cover crops provide ground cover and reduce soil loss to wind and water erosion.

These strategies offer other ways to diversify your cropping systems:

- **Intercropping:** Growing two or more crops in a proximity close enough to promote interaction between them is called intercropping. This can be done on a field-crop or a garden scale. One example of this would be planting beans under corn. More ideas are available in the ATTRA publication *Companion Planting & Botanical Pesticides: Concepts & Resources*.
- **Rotational planting:** In addition to filling a space with a diversity of species, you can extend the concept over time, as well, rotating crops through your fields, planting different species in the same space at different seasons or over the course of many years. Examples for produce farmers are available in the ATTRA publication *Scheduling Vegetable Plantings for Continuous Harvest*.
- **Integrating livestock:** A farmer can add more diversity by bringing animals into the cropping system. Following a harvest with grazing animals can add manure to a system, work soil, and turn crop remains into food. Learn more from the ATTRA publication *Integrating Livestock and Crops: Improving Soil, Solving Problems, Increasing Income*.

Grazing for Resilience

Looking out across a pasture, the peacefulness of the scene is deceptive. Above and below the soil surface is an ecosystem full of plants, predators, and prey, enacting the drama of competition for nutrients, survival, and the inevitable eventuality, death, and decay. Within the pasture system, nutrients are moving through the food web every second, constantly changing their state, location, and availability. The farmer or rancher acts as the director of this intricate dance, and the management decisions she or he makes will dictate how efficiently the system operates as a whole (Scott and Prater, 2018).

Managing livestock for environmental resilience is managing your pasture for soil health. Healthy soil is rich in microscopic diversity and available nutrients. Livestock stress plants through grazing and trampling. These plants respond by digging roots in deeper and growing back stronger, at the same time opening the soil to water and moving nutrients around. Livestock manure is a source for

more available nutrients that encourage beneficial insect and microbial action.

To gain the benefits of livestock action on the soil, the livestock needs to have a high impact on a small area and then be moved quickly to give the land time to recover. Techniques for managing livestock impact abound and go by many names: rotational grazing, management intensive grazing, adaptive grazing, regenerative grazing, and more. Lee Rinehart compiled a list of the latest resilient grazing resources from ATTRA Sustainable Agriculture in a blog post: <https://attra.ncat.org/adaptive-grazing-you-can-do-it/>.

Healthy soil in healthy pastures will be better able to withstand shocks to its system. Healthy soil will store more water, helping it withstand droughts. Healthy soil's greater structure will help it hold roots better, mitigating the risks of erosion. In short, managing your livestock for soil health will also help your farm or ranch increase its resilience against disasters.

Financial and Social Resilience

Financial Resilience

Financial diversity can be as important as environmental diversity in increasing your farm or ranch's resilience to disaster. The greater the variety of products that you sell and the greater the variety of customers you sell to, the more likely your farm or ranch can weather change.

Take the most recent public health disaster, the COVID-19 Pandemic, as an example. Throughout the country, news outlets were reporting on farmers who were harvesting potatoes right into a landfill or plowing vegetable crops right back into the ground. At the same time, local, diversified vegetable and meat operations were having one of their best years on record. Wholesale markets were bottoming out, while direct-to-consumer markets were booming. The lesson here is not that direct-to-consumer markets are more resilient. The lesson is that it is vital that a farm or ranch have more than one channel, rather than relying on a single market channel that could fall through.

It is easy to think of disasters as physical things: droughts, floods, ice, hurricanes, etc. But many disasters are solidly in the realm of humanity. Something as simple as an infrastructure failure at a terminal market may cause massive ripples through supply chains and webs. If the local sale

or auction barn burns down, does your ranch have another place to move product? If a salmonella scare causes folks to stop buying lettuce, does your farm have another product it can move?

Building up your product and market diversity now can save the farm or ranch in the future. Do not put all the eggs in one basket.

Social Resilience

When building your farm resilience, do not forget the community that you may need to rely on. In the event of a disaster, will your neighbors come to your aid? Will your customers, who have been purchasing product from you for years, be willing to pool a loan for you?

Remember that social connections take work. Investing in your community, however, is one of the oldest ways that humanity has of preparing for disaster. Think of early colonial farming communities working together and sharing crops. Think about cooperative business models that helped farmers work together to build profits.

Your leadership on the town council or at the school's parent-teacher association makes a difference. Pulling your neighbor's car out of the mud with your tractor makes a difference. It all builds a network of folks who will be willing to help you, should you need it.

Summary

Disasters do not wait for the moment most convenient to you. By definition, a disaster event has the ability to break your farm or ranch business, which, for many of us, is more than just a nine-to-five job, but a labor of love. In order to keep the farm or ranch running, it is important to know that there are many government agencies and organizations willing to help. Should something terrible happen to your farm, you will have somewhere to turn.

Your farm or ranch will recover more quickly if you are able to help the ones who will help you. Make preparations that can smooth the way for an organization to provide you aid by keeping good records and knowing what these organizations will need from you.

You can also build your own farm or ranch resiliency, starting today. Investing in the environmental health of your farm or ranch is paramount for mitigating the effects of physical disasters: floods, droughts, and weather events. Invest as well in your farm or ranch's financial and social resilience. Diversify your markets and build community.

When disaster comes to your farm or ranch, you will weather the storm by being prepared and knowing where you can find help.

Investing in Resilience

Investing in resilience is one of those things that make a lot of sense in theory but can be extremely difficult in practice. First, it requires investing time, energy, money, and other resources well in advance of having a problem. This proactive approach can be necessary in managing risks; however, the investment usually comes at a time when the problem(s) don't exist yet. Therefore, it can be hard to justify the return on the investment, especially when there are other adverse factors effecting your operation that could use the investment.

Second, although putting all your eggs into one basket is risky, diversification also has its challenges. These can arise from diversifying market channels, as well as introducing new enterprises to your operation. Diversifying can mean adding more time and labor, skills and knowledge, equipment and infrastructure, all of which will impact the farm's bottom line. Understanding costs of production and the impact they have on cash flow is important for recognizing the impacts diversification may have. Additionally, a break-even analysis and partial budget can be integral in seeing how adding new enterprises or markets can impact the business, as well as your health and well-being. There is a tipping point where the returns of diversification are less than the investments in time, money, and social capital.

Third, it can be difficult to make decisions toward achieving resilience, as it is a moving target. More importantly, it can be difficult to invest in resilience when it does not equate to a foolproof solution for your farm or ranch. Natural ecosystems are complex and unpredictable, and your investment in resilience should acknowledge this. Consistent monitoring and the ability to make necessary changes are critical, both in being prepared for a disaster and for the ability to bounce back quickly, should one take place.

Investing in resilience is an investment beyond the farm. Investing in environmental resilience is a way of giving back to the natural world. Investing in financial and social resilience builds human community around your farm or ranch business. The impacts of these actions may be farther and wider than can be immediately understood.

In short, investing in resilience is an investment in the long-term success of your farm or ranch. It might help your farm or ranch bounce back faster from a disaster. It might help you resist disaster.

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ATTRA Resources from the National Center for Appropriate Technology

These resources are available free online at www.attra.ncat.org.

Adaptive Grazing – You Can Do It

Basic Accounting: Guidance for Beginning Farmers

Beginning Farmer Tutorial

Building Healthy Pasture Soils

Companion Planting & Botanical Pesticides: Concepts & Resources

Crop Insurance Options for Specialty, Diversified, and Organic Farmers

Integrating Livestock and Crops: Improving Soil, Solving Problems, Increasing Income

Managing Soils for Water: How Five Principles of Soil Health Support Water Infiltration and Storage

Noninsured Crop Disaster Assistance Program and Whole-Farm Revenue Protection: Understanding the Differences

Nutrient Cycling in Pastures

Scaling Up for Regional Markets

Scheduling Vegetable Plantings for Continuous Harvest

Soil Health and Livestock: ATTRA Resources

Soil Health Principles Webinar

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Published June 2021
© NCAT

Tracy Mumma, Editor • Amy Smith, Production

This publication is available on the Web at:
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IP613
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Version 081621

