**TRANSITION STRATEGIES FOR**

**ORGANIC FIELD CROP & LIVESTOCK PRODUCTION**

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**Crop rotation, systematic use of soil building legumes and livestock manure, and biodiversity are the foundation practices for organic grain and forage production. High nutrient demanding crops may require manure to supplement the nitrogen fixation and nutrient cycling of legumes. Crop rotation plan possibilities will vary widely based on the region, rainfall and local climate where the farm is located.**

**Beginning or Transitional Crop Rotation**

Current/Previous Crop Followed By Followed By

Currently Wheat Red Clover Red Clover

 Alfalfa Alfalfa

 Fall Peas (Winter Annual) Corn, Milo, Soybeans

 Cow Peas (Summer Annual) Corn, Milo, Soybeans

Last Fall Corn Soybeans Wheat, winter legume

 Spring Peas for Grain Corn, milo or soybeans

Last Fall Soybeans Cereal grain + legume Alfalfa, clover, corn,

 milo

Currently Clover or Alfalfa Cover or Alfalfa Alfalfa

 Corn, Milo, Soybeans Corn, Milo, Soybeans

 Wheat Soybeans, Legume cover crop

Once the fields or farm are through the transition period, one should try to have in place a **systematic crop rotation plan** with a mix and sequence of grain, forage and cover crops, with suitable amendments of supplemental manure or other inputs, that provide the fertility needs and weed control framework for sound crop production.

**Key Fertility Practices & Supplemental Nutrients**

A. Legume Green Manure Crops (Primary source of N, Organic Matter & other nutrient benefits)

B. Grain Legumes (Supplemental N)

C. Livestock Manure (Supplemental N, major source of P & minor elements)

D. Lime (Raise soil PH for reliable legume production)

E. Rock Phosphate (Phosphorous)

F. Chilean Nitrate (Supplemental N – up to 20% of crop N requirements)

G. Other Amendments (Fish emulsions, mycorrhizal formulations, etc.)

**Weed Control**

A. Key strategy is to deplete weed seed bank in the soil & prevent weeds from making seed. Eliminate weeds in growing crop that compete for sunlight, nutrients and water.

 1. Crop Rotation is Key Practice

 2. Timely & Effective Pre-plant (Conservation) Tillage

 3. Mow or graze (better conservation practice than tillage)

 4. Timely & Effective Row crop Cultivation

 5. Maintain tillage and row crop cultivation equipment in good condition

 6. Use cover crops whenever possible

B. Treating Major Problem Weeds

 1. Cocklebur (Rotate to cereal grain & do mid-summer tillage to sprout seed, rogue fields in soybeans)

 2. Grasses (Use conservation tillage, stay off wet fields, early cultivation)

 3. Pig weed / Velvet weed (Conservation tillage, stay off wet fields, avoid planting in front of rain, early cultivation, hand rogue bean fields)

 4. Morning Glory (cereal grain followed by mid-summer tillage)

 5. Bindweed (Try to eliminate with chemicals before transitioning to organic; no really good treatments – prevention is key; thick sod crops and/or grazing can help manage pest)

 6. Many weeds are palatable and nutritious for livestock; grazing and/or mowing can prevent seed formation

**Insect & Disease Prevention & Treatment**

A. Establish & Maintain High Levels of Biodiversity

B. Key Insect Issues & Treatments

 1. Alfalfa weevil (fall & winter graze, burn, inter-seed other species, graze, cut hay early, light tillage, biological treatments)

 2. Chinch bugs (Plant corn instead of milo, separate cereal grain from corn or milo, plant corn early, biological treatments, substitute other crops)

C. Disease Issues

 1. Use disease resistant varieties

 2. Practice good crop rotation

**Conservation & Tillage**

A. Have conservation structures in place, e.g., terraces, waterways, grass buffers, etc.

B. Use conservation tillage & minimize tillage operations, manage crop residue

C. Cereal & sod crops in rotation, use more extensively on highly erodible fields

D. Systematically use annual cover crops & cover crop mixes

**Develop Written Crop Rotation Plan**

A. Crop rotations systematically applied over several fields or farms can get very complicated. Developing a written plan helps with establishing, implementing and monitoring the rotation system.

B. Farm Maps (May need to reconfigure field boundaries)

C. Crop Rotation Summary (Sets out the basic rotation sequence, along with fertility, weed control & cover crop practices)

D. Crop Rotation Field Plan (Sets out how the rotation will occur on each of the fields over the period of at least one rotation cycle)

E. The Plan should be both Disciplined and Flexible

**Farm Technology & Field Equipment**

The claim by organic critics that organic agriculture is a throw-back to farming of the 1930’s with regard to adopting advances of science and technology is untrue and naive. While organic practices and standards prohibit the use of manufactured chemical fertilizers, herbicides and pesticides, along with genetic engineered (GE) crop varieties, the full range of advances in mechanical, electrical, digital and internet based technologies, along with plant breeding which is not GE based, are available to, and used by, organic farmers. Organic farming system design, practice and evolution are based more on the scientific foundations of biology and ecology instead of manufacturing chemistry.

A. Diversity & Variety of size and “newness” in farm equipment use

 1. Older, smaller (1970’s or 80’s) vintage, well maintained and skillfully used, can be effective

 2. Organic farmers also use much larger, newer machinery to great effectiveness

B. Mechanical Machinery Advances that Serve Organic Farmers well

 1. Dramatic improvements in power equipment design, durability and function of diesel engines, hydraulics, brakes, power steering, implement lifts, noise reduction, etc. have greatly improved efficiency and effectiveness of field operations.

 2. Improvements in design and function of tillage and row cultivation equipment for conservation residue management reduce the risk of soil erosion and improve water infiltration and the effectiveness of these field operations

 3. Advances in planter and seed drilling technologies make possible some organic crop seeding in high residue and no-till applications

 4. No-till or high residue grain drills have an important place in organic cropping systems to eliminate tillage when possible and to take full advantage of cover cropping opportunities

 5. A good, suitable manure spreader is essential for organic farms that produce their own manure or have access to off-farm manure sources

 6. Advances in grazing system design and technologies (fencing, water, cover crops) can be utilized in organic cropping system to great advantage for diversification and livestock integration

C. Information, Communication and Social Networking technologies and practices

 1. The internet provides easy access to high volumes of research and practice information

 2. Email and cell phones have dramatically improved the ease and extent of communication across an ever broadening range of on-farm and off-farm partners

 3. Information and communication technologies have improved and strengthen the extent and effectiveness of farmer directed cooperatives and other farmer organizations

**Post Harvest Organic Grain Handling, Storage and Shipping**

A. Developing and maintaining on-farm grain storage is essential for effective organic grain marketing

B. Consult organic certification standards on post harvest grain handling to develop suitable record keeping system, which will include the following

 1. Painted or magnetic bin signs for bin number and type of usage

 2. Bin logs for recording incoming and outgoing deliveries

C. Managing Stored Grain

 1. Stored grain pesticides are prohibited (other than use of diatomaceaous earth (DE)).

 2. Stored grain needs to dry, fairly clean, and regularly monitored to maintain good condition

 3. Bin’s should have aeration fans and floors, unloading augers, electrical access and necessary safety features.

 4. All weather, gravel access to grain bins by semi truck is important to facilitate reliable grain shipping

 5. Portable loading augers are essential; on-farm elevator legs are very good; portable rotary grain cleaners are very good to have on hand.

 6. A grain probe and a basic set of hand grain screens help greatly in monitoring grain quality and condition

 7. Keep the grain bin area clean, mowed and well maintained to prevent rodent and other pest problems

**Organic Livestock Production & Certification**

A. Key Criteria

 1. All feed, forage and pasture must by certified organic

 2. Conventional fertilizer and pesticide use are prohibited

 3. Antibiotics and growth hormone implants are prohibited

 4. Vaccines generally allowed, so long as non-GMO

 5. Develop animal ID and tracking system

 6. Breeding vs. slaughter stock distinction

B. Animal Handling considerations

 1. Pasture & outdoor access required

 2. Animals must have adequate space; avoid crowding

 3. Preventative animal health management practices required

 4. Alterations (castration, tail docking, etc.) restricted / prohibited

 5. Confinement & isolation (farrowing crates) restricted / prohibited

C. Resource Conservation Considerations

 1. Water quality protection required

 2. Suitable grazing management for grassland protection required

 3. Manure handling best management practices required

D. Key Challenges

 1. Brush control in pastures without herbicides

 2. Providing for high N requirements in brome hay fields

 3. Sericea lespedeza control

**Resources & Field Guides**

Kansas Rural Center (Sustainable Agriculture Management Guides)

 Web Site: [www.kansasruralcenter.org](http://www.kansasruralcenter.org)

ATTRA (Organic farming practices and certification publications)

 Web Site: [www.attra.ncat.org](http://www.attra.ncat.org)

SARE (Sustainable Agriculture Research & Education) Offers competitive grants and research reports on sustainable & organic practices. Web Site: [www.sare.org](http://www.sare.org)

SARE (Books & Bulletins on organic & sustainable practices) See book titled, “Organic Transitions”

 Web Site: [www.sare.org](http://www.sare.org) (see Learning Center/books)

CEFS (Center for Environmental Farming Systems), North Carolina State University

 Web Site: [www.cefs.nscu.edu](http://www.cefs.nscu.edu)

USDA – Various web sites: NRCS, National Organic Program

There are many organic information web sites accessed by google, e.g., organic agriculture, organic transition, etc.

**Organic certification programs/organizations commonly used by farmers in Kansas:**

Organic Crop Improvement Association (OCIA) (In Kansas local farmer chapters in eastern and northwestern KS)

 Web Site: [www.ocia.org](http://www.ocia.org)

Ecocert ICO

 Web Site: [www.ecocertico.com](http://www.ecocertico.com)