**PASTURE IMPROVEMENT AIDS** by Needful Provision, Inc. (www.needfulprovision.org) --2018

1. Annual aeration w/ spike aerator;
2. Marking, as needed, to make lister furrows to help flood irrigate … or install a pasture sprinkler-type irrigation system;
3. Use intensive rotational grazing w/ short grazing periods to remove half the forage on a grazing paddock and then rest each paddock for 30-days;
4. Utilize a pivot-type electric fence w/ Gallagher tumble-wheels to facilitate frequent movement of livestock on newly created paddocks;
5. Clip with a mower and chain-harrow as needed for weed control and the distribution of livestock manure;
6. Add a mobile pastured poultry operation to help control pests and parasites using birds to eliminate their potentially harmful larvae;
7. Help sustain species diversity using a no-till drill to annually plant cover crop mixes and/or diverse perennial-pasture mixes;
8. Control grazing cycles so grazing action will encourage root growth and root exudation of plant sugars that feed soil microorganisms;
9. Use shade systems and extra water tanks to prevent concentrations of livestock manure near an existing water tank;
10. Paddock sizes should generally be small with a high stocking density with livestock being moved frequently with the aid of item number 4 above, the mobile electric fence;
11. By using the above methods, nature will work with you over time to improve pasture soil fertility and forage yield without use of expensive chemical solutions that seldom work;
12. Provide a year-round living cover with perennial pasture crops and/or annual cover crops;
13. Quickly reduce any use of chemical fertilizers dropping down to no more than five pounds per acre of nitrogen in the spring;
14. Promote plant and microbe diversity by incorporating short, medium, and tall-statured plants plus a mix of cool & warm-season grasses as well as broad leaves for cover crops;
15. Initially apply a pathogen-free organic/ aerobic compost tea (15 to 20 gal. per acre sprayed-on in the spring) to jump-start your transition to biological farming/ ranching w/ a mix of bacteria, fungi, protozoa, nematodes & other soil microorganisms. An Earthfort’s Soil Food Web analysis kit is needed to make certain you have what additions are required by your pasture soils.

**N.B.** a) Pasture productivity is based on the relationships between plants, soils, and animals. When you feed soil microbes they feed the plants, and the plants feed your livestock. If your soils are low in carbon, cover crops will need to be grown and incorporated for biological processes to function effectively. When this happens, you may rely on soil microbes to cycle nitrogen, phosphorus, potassium, sulfur, water, and other nutrients to your pasture forage species. Again, feed the soil microbes, they feed the crops and crops feed your livestock.

b) The addition of a bioactivated biochar, at the rate of a 10 percent soil supplement, to the top 8-inches of soil, greatly increases soil fertility by supporting and adding to the soil microbial activity. At present, making this addition to pasture soils is seldom affordable or economical.

**Farm Equipment Needed** to support the Above (rent or purchase)

1. Tractor; 2) Mower; 3) Chain-harrow; 4) Spike aerator; 5) Marking (lister-

furrow) implement; 6) No-till pasture drill; 7) Pivot-type electric fence w/

Gallagher tumble-wheels; and 8) Solar-powered electric fence charger.

**Beginning Farmer/ Rancher System Economic**

Given the costs for land, water, and livestock, most of the farm equipment listed, to support subject operations, will need to be rented until farm/ranch profits fully justify the purchase of same.

**Safety Factor:** Irrigation water can be contaminated at times. Use the National Testing Labs (Watercheck) to run a full range of tests to determine water content.

**Reference:** “Building Healthy Pasture Soils.” by NCAT/ ATTRA (tel. 1-800-346-9140) …. a sustainable agricultural information service.