

KEYLINE PLANNING

Notes from a workshop by Beth and Eric Ardapple-Kinberg
at the 2nd Internat'l PC Conference, Olympia, WA, August, 1986.

KEYLINE PLANNING offers insights not offered elsewhere. It lends itself to real cooperation between the farm and the landscape, and will free the farmer from economic pressure by lowering overhead costs. Unique aspects of Keyline include the soil development methods and the water conservation methods used.

KEYLINE IS A METHOD OF LAND DEVELOPMENT AND IMPROVEMENT, as opposed to U.S. Soil Conservation Service methods, which are far too limited in scope and concept. When you are in the position of saving soil from erosion, you are already in retreat. Yeomans (developer of the keyline approach) sought enhancement of fertility, with soil and water conservation being natural products of that process. **KEYLINE METHODS CAN TRIPLE FERTILITY AND DEPTH IN 3 TO 5 YEARS.**

KEYLINE IS A WAY OF SYSTEMATIC PLANNING FOR URBAN OR RURAL ENVIRONMENTS based on the Yeomans Scale of Permanence:

1. Climate
2. Land form
3. Water
4. Roads
5. Trees
6. Buildings
7. Subdivisional fences
8. Soil

Planning in this order helps one to deal with the most permanent and least changeable aspects of the landscape in the most appropriate fashion before dealing with the changeable aspects. CLIMATE and LANDFORM are almost unchangeable aspects of landscape. WATER conservation is a major part of keyline. ROADS tend to divide the land into zones. TREES must be left in the right places for shade, windbreak, nutrient cycling, catching and filtering water, etc. (Yeomans' 1971 book, The City Forest, discusses the uses of strips of forests in the right locations, as well as many other things). BUILDINGS should be sited to overview the farm for safety, joy, and planning. SUBDIVISION of the land (fences or otherwise) follows natural configurations. The SOIL is improved in each zone through keyline methods.

The top of primary valleys are the steepest part of any landscape. Where short, steep slopes change to flatter, shallower slopes is the KEYPOINT. The KEYLINE is the contour line that runs through that point. This keyline is used to take water from the valleys out toward the ridges by digging a furrow slightly off contour from valley to ridge. The valleys are a small percentage of any landscape, while ridges are a large percentage of any landscape. Valleys tend to have adequate water, ridges tend to dry out, which reduces plant productivity. If we can make the ridges as moist as the valleys, we can make the larger percentage of land more productive.

6 TECHNIQUES TO INCREASE SOIL FERTILITY, DEPTH, AND WATER HOLDING CAPACITY: ABSORPTION FERTILITY:

1. PATTERN CULTIVATION
2. USE OF DEEP ROOTED LEGUMES
3. MANAGEMENT FOR SOIL CLIMAXES - NOW IT IS CALLED IT NATURALLY / MAXI DEATH
4. STRIP FORESTS
5. LOW MAINT. / LONG TERM USE OF RUNOFF WATER FOR IRRIGATION
6. CROP ROTATION AND INTERCROPPING

Follow skyline with a special chisel plow (the Yeomans Plow, of course) 1/4 to 1/2" below existing topsoil level, then parallel lines to that above and below skyline to top and bottom of field. Chisel just before rains in autumn for three years, and each year the topsoil depth will increase. Deepening and loosening the soil makes it your biggest and cheapest water storage system, right where the plants need it. Seeding, if needed, is done right after plowing via broadcasting and letting rain wash seeds into chisel furrows. Drill planting would probably work without disturbing the chisel furrows too much.

LEGUMES:

Deep-rooted legumes help open up the soil as well as fixing atmospheric nitrogen and helping feed grasses. These deep roots then become food for soil climaxes (see below).

SOIL CLIMAXES:

"Mulch under the ground" by killing root structures. Just before flowering is when there is the maximum amount of roots structure under the ground. If the plants are harvested, either through mowing or quick and heavy grazing, a large percentage of the roots die, creating an explosion of microbial activity. As the plants recover and begin to grow, there is lots of food available for them to grow healthier and bigger and deeper-- and the topsoil does the same. The more soil climaxes (microbial growth explosions) you can create in a year, the faster the fertility increases. This is recommended to be done 3 years in a row, then skip two years, do it two years, and so on.

CROP ROTATION

The usual, except that one takes the best field and crops it, and takes the worst field and puts it through the pattern cultivation method to improve fertility.

WATER CONTROL

The idea here is to build reservoirs to hold the excess rainwater which usually runs off the land and save it for irrigation. This irrigation water is released down skyline furrows at high volume flows so it flows fast and doesn't waterlog soils near the irrigation channels before the water even reaches the downslope areas. One must control the water over the whole area so that it is used effectively and large quantities of water are absorbed by the soil evenly across the area. The water should cover the land for only a short time, or microbes get killed by lack of oxygen.

Ponds and dams are designed so that their total volume of storage is available for irrigation. 12 - 16" pipe is used at the outlet to allow > 1/2 million gallons per minute to flow out of the pond. Channels are structured a specific way to allow for flood flow irrigation down the slope by gravity.

Irrigation allows more soil climaxes per season, thereby increasing the speed at which fertility can be increased, and heightening the level of fertility obtainable.

STRIP FORESTS

These allow for different microclimates in the landscape. Trees are important for maintaining fertility and rainfall. They are set on the skyline and on the steeper slopes above it. Yeomans recommends using the chisel plow down to 18" - 20" 2-3 times before planting trees to reduce the need for irrigation. Trees should be spaced to allow pattern cultivation between strips and within strips until they are established. On steeper lands the cultivated strips between forest strips are narrower than on shallower slopes. There is a formula for determining this distance based on slope in Yeomans' book Water For Every Farm.