

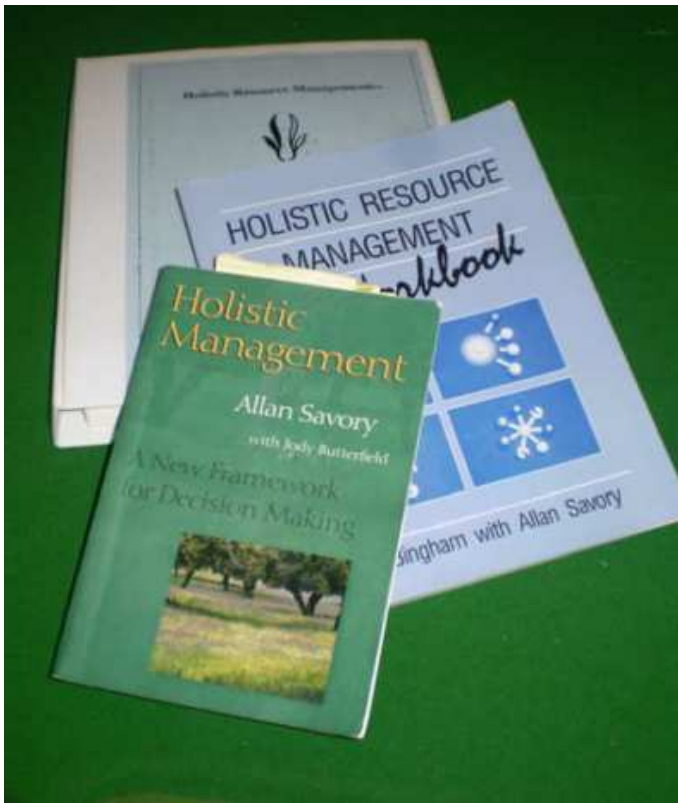
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Good Food That Tastes Great

&
**Chesapeake Center for Regenerative Agriculture;
A member of the Savory Institute Network**

Holistic Planned Grazing – No Kill Cropping



*No cattle grazed the plot on the left. On the right, hooves broke up the soil and animal waste provided fertilizer.
(Photo: Africa Centre for Holistic Management)*



Holistic Management- a Breakthrough

There is now no doubt that the advent of Holistic Management as described and championed by Alan Savory has revolutionized sections of the grazing industry world wide. The impressive results that many farmers and ranchers have achieved to their triple bottom line, that is making economic, environmental and socially sound decisions is testament to the validity of this approach.

The lack of industry-wide take-up is also proof of the sophisticated understanding and ethics required to adequately implement the techniques. It is from a basis of understanding of the principles of holism as described by Savory in his text *Holistic Management* that No Kill Cropping can be contemplated. Without at least some thought and examination of the holistic consequences of standard cropping approaches, progress toward No Kill will not occur. When Savory wrote his book, he put forward concepts as ideal future cropping practices. No Kill Cropping back then was a concept that had yet to be practiced.

When practicing Holistic Management one goes through testing procedures of every major decision and views the results it gives in the planning phase. Then one constantly monitors what happens. In the following paragraphs I will attempt to test No Kill Cropping against the cropping concepts found in Chapter 40 of Savory's landmark text. I believe it will become obvious that No Kill Cropping is a very worthy follow-on breakthrough that potentially does as much for cropping as Holistic Planned Grazing did for grazing management. As with all the tools at our human disposal, it can be understood well or poorly and also applied either well or poorly. It is in both the application and understanding that the theory meets the practicalities of day to day and a thorough knowledge of No Kill is essential to gain the benefits of the power of this revolutionary approach.

Cropping: Practices That More Closely Mimic Nature

Chapter 40 encapsulates Savory's fundamental guidelines for a cropping system that would be developed one day, that could exhibit the elements necessary as he saw them. It also describes the very effects that No Kill brings out in the field.

Savory views are in line with what Sir Albert Howard, the father of modern day Organic Farming observed. In a celebrate passage Howard in his book, *An Agricultural Testament*, wrote "Mother earth never attempts to farm without livestock; she always raises mixed crops; great pains

are taken to preserve the soil and to prevent erosion; the mixed vegetable and animal wastes are converted into humus; there is no waste; [and] the processes of growth and the processes of decay balance one another.”

The first sentence of Savory's chapter on cropping points out the current thinking on growing crops is the antithesis of mimicking nature. “Growing crops always involves the creation of artificial conditions and the loss of the natural balances and inherent stability of the original biological community.”

This statement is correct for every cropping system except No Kill. That is why No Kill is such a huge breakthrough – and break from the past. Savory describes many of the features of standard cropping techniques and their consequences for natural functioning. He points out the reliance on a small number of plant species that only make part time use of space and resources and how coupled often with bare soil practices, produce disruption to mineral cycling. He further explains some of the instabilities that come with simplicity of crop production. The damage caused by cultivation and then the introduction of artificial fertilizers, increased mechanization and finally engineered herbicides and pesticides has lead to our soils being treated as just a growing medium to hold crops upright. While noting that soil is a living organism that reproduces itself like most organisms do, Savory calls for a departure from traditional and conventional approaches. He calls for cropping that more closely mimics nature and enhances rather than diminishes water and mineral cycles, energy flows and community dynamics. I will now examine all the fundamental guidelines that Savory aspires toward and show how No Kill meets them all.

“Keep Soil Covered Throughout The Year”

With No Kill Cropping all existing plants and residues are retained thereby keeping the maximum amount of coverage at all times. No dry matter is incorporated by the minimal disturbance of the sowing operation and no material is removed from the paddocks by mechanical means. The application of No Kill to grasslands encourages more dry matter production and thereby more material in a rapid manner to help cover over bare interplant spaces.

Soil exposure is a large impediment to many natural functions and No Kill offers an additional way of achieving coverage that can speed restorative functions beyond what can be achieved by grazing alone. Little standing material is laid down in the No Kill sowing operation, so the existing

standing material adds considerably toward ground coverage as it falls or gets trodden down by livestock during the year.

While Savory hopes that the long researched perennial crop trials being done at the land Institute and Rodale will bear substantial fruit is laudable, No Kill offers a much easier, more achievable route to achieving year-round coverage. In other words- don't try and make annuals what they aren't, just grow annuals amongst the perennials in a clever way by No Kill Cropping.

“Do Not Turn Soil Over”

Savory mentions Edward Faulkner, who in his book *Plowman's Folly*, alerted farmers to the damage done by deep plowing. What we now know as the soil food web is completely disrupted when the soil is turned over. For most crops, say corn for example, only a small portion of the plant is harvested and the prevailing thought is to plow under the residual to return “organic matter” into the soil. The problem with this approach is the residual is raw organic matter not the humus needed by the soil food web that has been severely damaged by the plowing. The raw “organic matter” due to the disturbed soil food web more often than not creates a barrier in the soil that is then compacted when heavy machine crosses the land.



Seeding Grain with a Drill into Perennial Pasture

No Kill Cropping does not turn the soil – in fact, one of the outstanding attributes of the system is that it is very hard to see where the area has been sown. This leaves all the biology in the micro-environments that it is adapted to. Disturbing soil also creates niches that weeds and other opportunistic organisms quickly colonize. Since disturbing the soil is not done in No Kill, many weed species don't even get the opportunity to germinate and establish thereby preventing a problem occurring at all.

The movements toward so-called “conservation tillage” (no till) have simply replaced tillage disturbance practices with herbicide usage that eliminates a number of ecosystem functions. Herbicide use in this context can best be viewed as only a slightly lesser evil than cultivation since the

chemicals applied disrupt and destroy the soil food web.

“Endeavor to Maintain Diversity and Complexity in the Community”

This is the fundamental core of the No Kill concept. To grow crops the No Kill way you must not deplete the diversity at all. All plants are retained in No Kill paddocks. Retention of all plants leads toward the benefits outlined by Savory where the insects and microorganisms attracted by the existence of weeds in the field add to the resilience of the system. By keeping a plant diverse and perennial based grassland system in the long run complexity continues to build as various ages, heights and shapes exhibit themselves. This continues to offer a greater range of habitats, both large and small, that many other organisms can colonize.

“Avoid Monocultures”

Savory makes the observation as to how exposed monocultural systems are to damage by disease and pest attack. Any organism that is adapted already or becomes adapted amongst a large amount of a single plant species will rapidly make use of that monoculture. No Kill is the ultimate in polycultures in that it builds upon good grazing management that has increased the diversity and introduces a further desirable set of plants into the underlying complex perennial grassland.

Savory cautions about moving progressively toward complexity to minimize business and ecological risks. No Kill offers that by allowing profitable grazing to be maintained from the beginning of the process while growing crops over the top in a layered approach that is profitable right from the start.



“Create Edges”

There could be no greater amount of edge effect in cropping fields than what is created under No Kill conditions. The intertwined mix of perennials, annuals, forbs and woodier vegetation hosts all sorts of large and small niches that species too numerous to count inhabit. This is edge effect on the micro scale that directly impacts on the amount of biological activity that occurs on the soil surface. No Kill can provide even more edges by the smart alternation of different crop styles, heights and

sizes. Differing crops for example growing different grains in strips, provide very different residues that increase the number of edges markedly. The addition of shrubs and trees to fields mentioned by Savory in this section is also a very useful step.

“Preserve Genetic Diversity”

Genetic diversity of crops is enhanced by growing them in diverse conditions. Over successive harvests and seasons seed can become more locally adapted and suitable for sustainable long term production. Savory, like many others, is worried about the decline in crop genetic diversity. This loss of local varietal diversity is often linked to the economic pressures that drive farmers toward the production of monocultures. No Kill is a potential helpful addition as it allows profitable production without having to resort to expensively purchased and produced monocultures.

“Incorporate Livestock”

Savory describes the gradual transition that cropping historically did from simple swidden agricultural methods to those relying on the spreading of animal manures to maintain productivity as the human populations built past the point that slash and burn techniques were possible. Until very recent times domestic livestock formed part of the nutrient supply for cropping programs. This has been at considerable energy and time cost as the manure had to be spread over the areas where the crops were growing.

No Kill eliminates the energy input problem as it is a part of the foundations that animals are used as a tool for the grassland health that the crops are grown



into. Properly handled grazing distributes both manure and urine across the landscape and thereby further encourages the plant growth and natural function cycling. This leads toward more nutrients being available for the crop plants that are sown.

Savory also points out that livestock consume and make use of many plant residues that would recycle only at a very slow rate without the livestock. This enhances further cycling of the mineral

cycle and the energy flow embedded in those nutrients.

“Minimize Irrigation”

Irrigation inevitably creates a more artificial environment that rain based systems and overwatering is a factor that cannot be avoided because of the unpredictability of additional rainfall events. Savory makes the case for more efficient delivery systems but also lists the obvious drawbacks of large capital investment and energy use that these usually require. Additionally long term constant irrigation causes salinization of the soil.

No Kill Cropping does not have any elements that relate directly to whether irrigation is applied or not but there are at least some applications of No Kill that can suit even intensive irrigation operations. No Kill crops have been used with good success within Vineyards and Orchards and are particularly appropriate for horticultural use where minimal soil surface disturbance is desirable. With intensive annual crop production under irrigation No Kill can be a very desirable option if the area is subject to flooding or erosive events. Keeping full grassland coverage in those situations can ensure that the resource captures nutrients in flooding events rather than massively losing nutrients via soil erosion.

“Manage the Water Catchments”

Stabilization of the catchments by better management of the soil surface conditions is called for by Savory and No Kill delivers this sort of result on a continuing basis. No Kill keeps the maximum diversity of living and dead plant material in place- not shifting it at all thereby ensuring the final point of this section- that the rain soaks in where it falls. It is very obvious on No Kill fields that no puddles form- even during the heaviest downpours. The retention of so much biological activity opens up all sorts of channels for the water to travel down into the soil rather than across it.

If rain is allowed to infiltrate where it arrives on the ground surface, then the whole hydrological cycle of the catchment changes toward its original function. This then allows aquifers to recharge and discharge at natural rates leading to healthier springs and rivers.

“Minimize Energy Consumption”

No Kill Cropping is the least energy intensive cropping operation available. With so little draft

needed at sowing the energy needed to pull various sizes of machinery can be supplied by very simple machinery, or in the case of developing countries by animals. Sowing a No Kill crop means travelling across the soil when it is at its strongest capacity needing less energy as much of the energy used with modern tractors in standard cropping goes toward compacting the ground for the tires to grip. Outside inputs that are energy intensive are not used in No Kill so drastically reducing the total energy usage of the system. On a total inclusion basis No Kill uses little energy in both the capital set up and production aspects. It is a system that produces much more energy than it consumes.

“Feed Soil Rather Than Plants”

No Kill does not rely on fertilizer applications to either drive production, or replace what is removed. Encouraging maximum plant growth above ground allows the full depth of subsoil to be explored and exploited by plant roots. There is a vast amount of nutrients available and they are transported to the surface via the plant roots. Two of the obvious building blocks for plants are Carbon and Nitrogen. In a No Kill approach Carbon is supplied by superior grass growth with good grazing management and a considerable amount of additional material from the crop growth itself. One of the standout features of No Kill is that the addition of the crop often results in more than a third extra total biomass and much of that is extra Carbon that can fuel further growth into the future. Nitrogen, as is well known, can be supplied by the relationships that many plants have with bacteria and the more diversity of plants in total the more Nitrogen fixing possibilities there are. Many of the species do not produce huge amounts of Nitrogen individually but in total they combine to provide enough for the grasslands to thrive. Keeping the whole range of plants within the grassland also deposits all sorts of different nutrients and compounds that cannot be brought there by a simpler range of plants. Every plant brings different nutrients from different depths at different times. Use this simple biological fact to supply not only the obvious nutrients but also the many minor nutrients and compounds that enable plant growth to continue indefinitely.

“Human Labor versus Machines”

Savory makes an enlightened plea for agricultural systems that incorporate more human labor that is neither degrading, nor inhumane. The application of No Kill Cropping increases the management understanding needed but makes the whole operation more flexible to suit the local human needs and desires. Reports from practitioners routinely indicate that the level of work pressure that they experience declines sharply with the application of No Kill as it gives greater

choice and wider opportunities on a whole farm basis. No Kill Cropping places a greater reliance on management expertise but a lesser need for physical activities and the menial drudgery associated with standard practices.

“Conclusion”

Savory writes: “The agriculture of the future, I believe, will have to include greater complexity still in the crops we plant and the animals we manage with them. It will also require the use of new technologies that, unlike those used in the past, are first tested toward a holistic goal for their ecological, social and economic soundness.”



No Kill Cropping fulfils completely the concluding desire of Savory’s vision. The desire fits the practice of No Kill like a hand in a glove. The principles of No Kill owe much to the thinking style that Savory has championed and it is the cropping system that Holistic Management practitioners can consider if they are to hold true to the original vision. Holistic Management and No Kill Cropping- two breakthroughs that are a natural fit.

The book excerpts are from Chapter 40 out of section VIII of the *Holistic Management* (second edition 1999) by Allan Savory.

