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Introduction

When designing grazing systems for outdoor pigs, consider the natural behavior of this species. In addition to their trampling and rooting activities that can destroy the vegetative ground cover and alter the soil, the selection of dunging areas can pose the risks of nutrients run-off, leaching, and soil erosion. The potential environmental damage from outdoor pig production has been related to the stocking rate and the length of stay of the pigs in a particular area.

As social animals, pigs tend to graze in groups, and differently than cattle, they concentrate their activities in certain areas of the paddock situation that could lead to over and under grazed areas in the same pasture.

Pasture damage may be reduced by implementing management systems where paddocks are subdivided in small plots and animals are periodically rotated among them. It has been observed that rooting and trampling action has been exerted in previously disturbed areas, suggesting that with the approach adopted in this document (removing fences in following grazing cycles) the damage could be oriented to previously damaged areas reducing the total area of impact. This management will allow for a recovery period of the vegetation and a better distribution of the deposited nutrients. Pigs should be grazed in well-established pastures, and the height of the sward monitored, as short vegetation has been related to higher plant and soil damage.

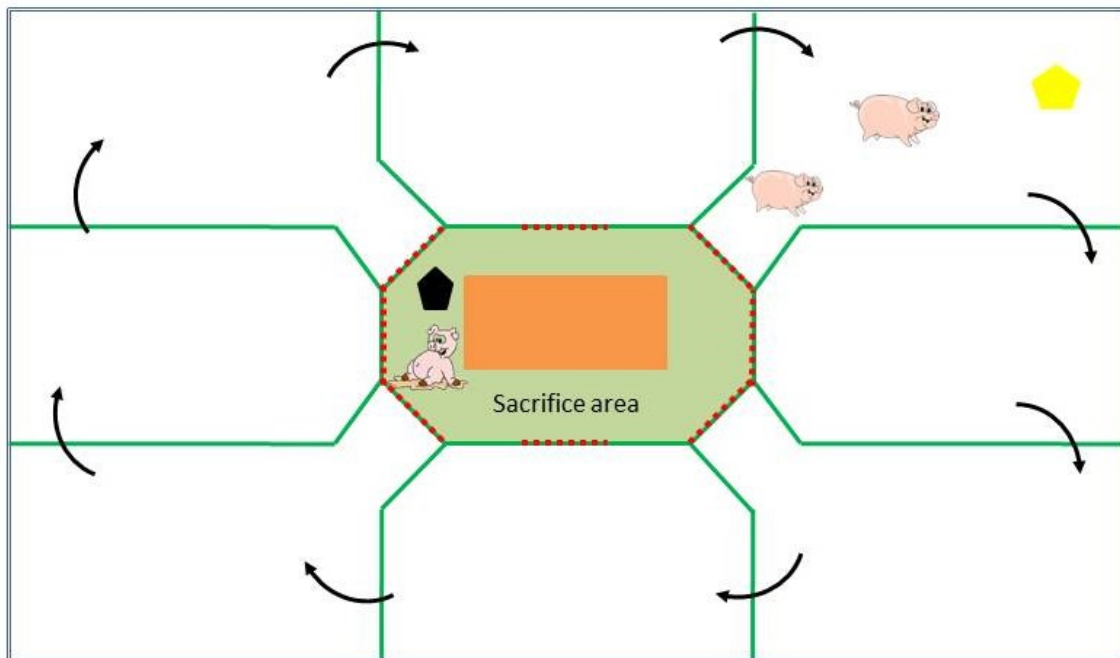


Bermudagrass paddock being managed rotationally with a stocking rate equivalent to 11 sows/ac, and one week of occupation for the grazing sections. Pigs have permanent access to the central/sacrifice area

The approach

The rotational system consists of the division of the paddock into nine sections, pigs have permanent access to the central area (sacrifice area, 1/9 of the area available), and are rotated between the other(s) section(s) (8/9) on a weekly basis. Shelter and water are available at the central area, whereas the feeders will be moved to the section being grazed by the pigs. The layout of the paddock can vary according to topography and available land. The use of electrical fencing allows for flexible implementation, with special emphasis on a design that does not allow pigs to pass through, jump over or dig under the wires. Like most other livestock pigs can also be trained to respect electric fences.

The proposed system has been successfully implemented at the Center for Environmental Farming System (CEFS) farm located in Goldsboro NC. Gestating sows and finishing pigs were rotationally managed in bermudagrass and tall fescue, while maintaining over 70% ground cover.



LEGEND

- | | | |
|---|-----------------|-----------|
| Exterior fences: Woven wire
or 4-wire electric wires | ⋮ Internal gate | ⬠ Waterer |
| ▬ Internal fence: 1-2 aluminum
wire or poly wire | ■ Shelter | ● Feeder |

Figure 1. General diagram of a paddock with its 9 sections. External fence can consist of woven wire or 4 strand of electric fence. The boundary of the central/sacrifice area will be maintained for the grazing period, and can be built with metal posts. The rest of the interior subdivisions can be constructed using plastic step post and 1-2 strands of electric aluminum or poly wire.

Assumptions and goals in designing pasture subdivisions to manage animal movement and use of forage within paddock

1. The primary goal is to protect the soil and vegetation within the pasture.
2. The forage value/benefit for growing-finishing animals is of little nutritional value, however gestating sows could utilize 30-40% of their daily ration if good quality forage is available.
3. It is assumed that the permanent pasture areas are sized to carry the animals assigned to it; in other words the stocking density is such that vegetation survival is likely.
4. The stocking rate established is equivalent to 6 sows/ac or 20 growing-finishing pigs/ac, respectively
5. The illustrations presented here will allow the manager to control the access time to each subdivision within the pasture which will help control manure distribution and rooting activity.
6. Continuous or alternate management could be employed in boars, farrowing and weaners paddock.
7. Rotational stocking management will be implemented in breeding, gestation and grower to finishing areas.
8. Electrical fence will be used to divide the pastures into subplots.
9. All paddocks will be equipped with water, shelters, wallows and bedding in the central “sacrifice” area where vegetation will be decreased during the use period.
10. Sows in breeding and gestation phases will be fed by hand within the currently occupied paddock, and feed equipment for grower-finishers will be moved from one paddock to another.
11. To minimize environmental impact, strategies like: periodic rotation of location of shelter, feeder and drinker areas and the use of compact surfaces under feeders and drinkers should be established.
12. It is assumed that there is a period of several weeks following occupation of a pasture before a new group of animals are reintroduced to the pasture, especially the finishing and gestation pastures.

Examples of pastures subdivision

Following are examples of pasture subdivisions for these classes of hogs:

Animals	Grazing period
Breeding Sows	4 weeks
Gestating Sow	14 weeks
Grower-Finishing	24 weeks
Grower-Finishing	26 weeks

An additional benefit of the rotational management system is the reduction on parasites load.

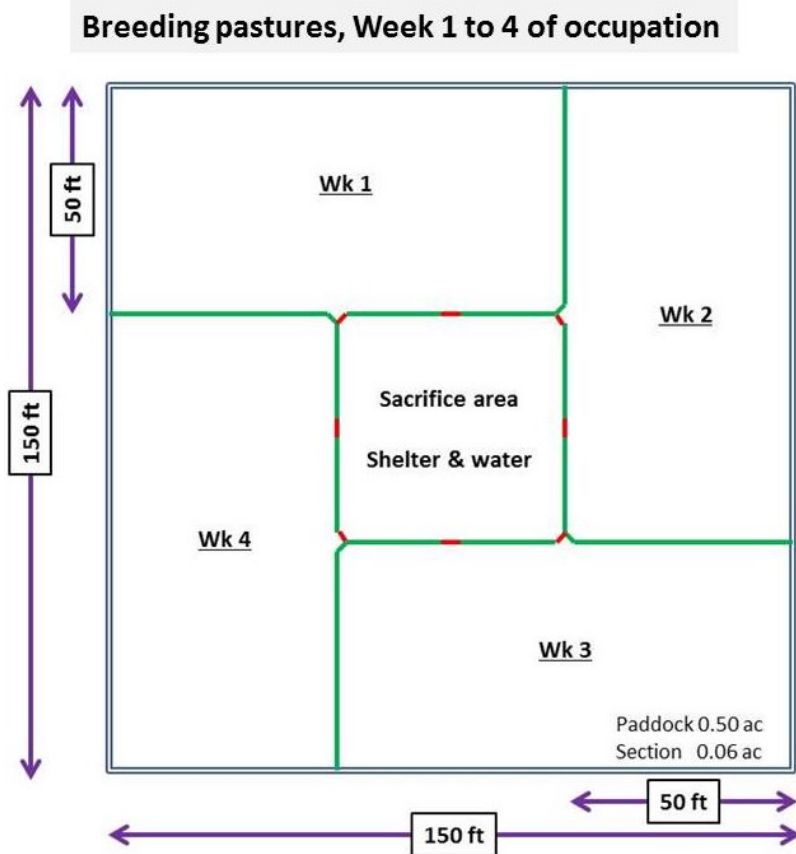


Maintaining a good vegetative cover helps reduce erosion and nutrient runoff problems

Example of pastures subdivision for breeding sows

Figure 2. Rotational animal management for breeding sows during a 4 week period

Example of how pastures for breeding sows could be subdivided for weekly animal movement. This example is for a 0.5 acre square block and four weeks of occupation, with a stocking rate equivalent to 6 sows/ac, but any size pasture could be proportionally divided into 9 sections with 1/9th of the area used as a sacrifice area.



Picture shows a 0.37 ac paddock divided into nine sections: One central/ sacrifice area, and 8 "Grazing" plots used once a week

Example of pastures subdivision for gestating sows

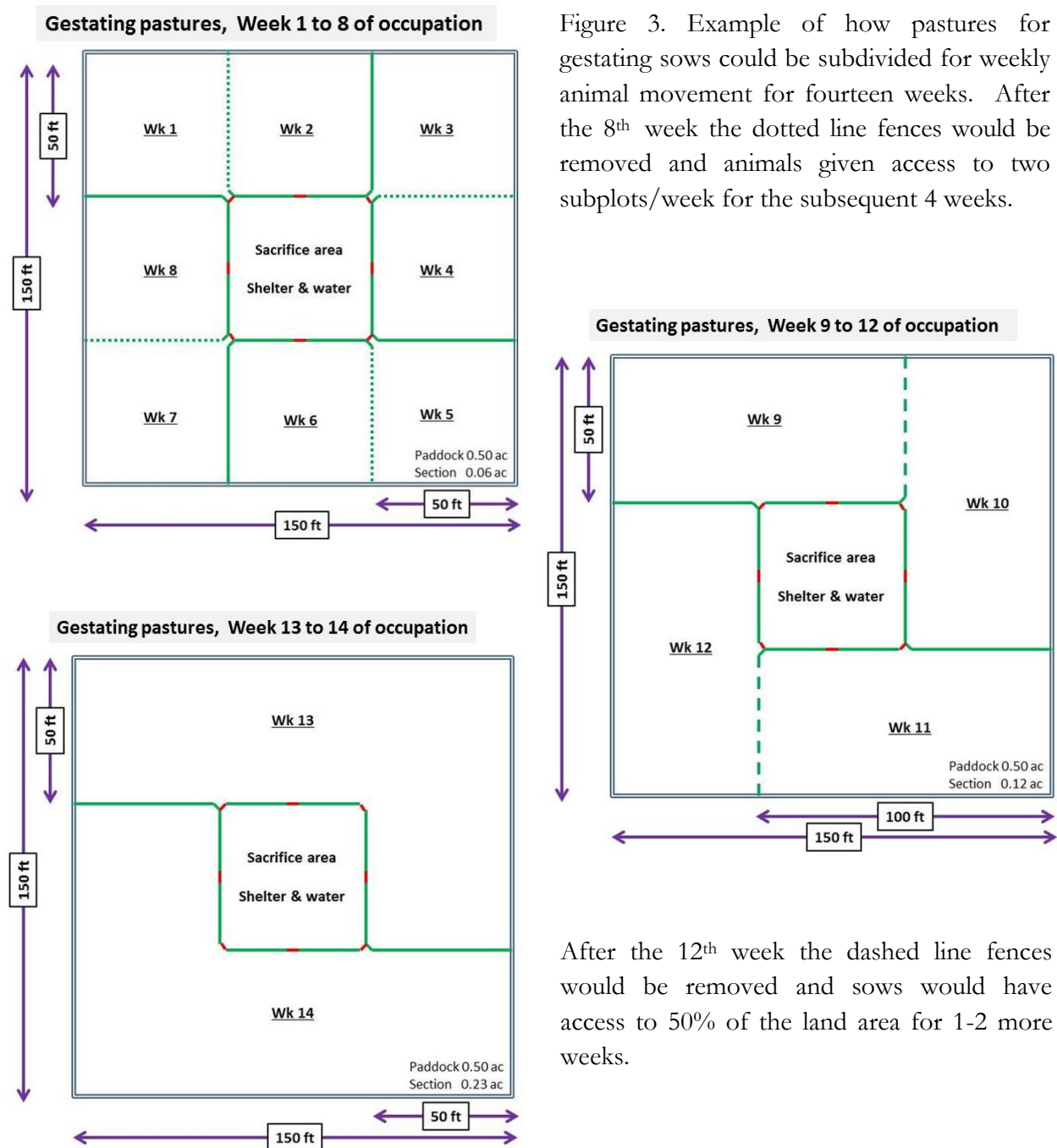


Figure 3. Example of how pastures for gestating sows could be subdivided for weekly animal movement for fourteen weeks. After the 8th week the dotted line fences would be removed and animals given access to two subplots/week for the subsequent 4 weeks.

After the 12th week the dashed line fences would be removed and sows would have access to 50% of the land area for 1-2 more weeks.

Gestation sows may not be on the Gestation pastures the full 14 weeks because they will stay in the breeding area 1 month and should be moved to the farrowing area at least 1 week before farrowing.



View of the sacrifice area of a 0.4 ac Bermudagrass paddock being managed rotationally with a stocking rate equivalent to 30 pigs/ac (3900 lb/ac)

Examples of pastures subdivision for growing to finishing pigs

The same principles already described can be employed to design pastures for growing to finishing pigs.

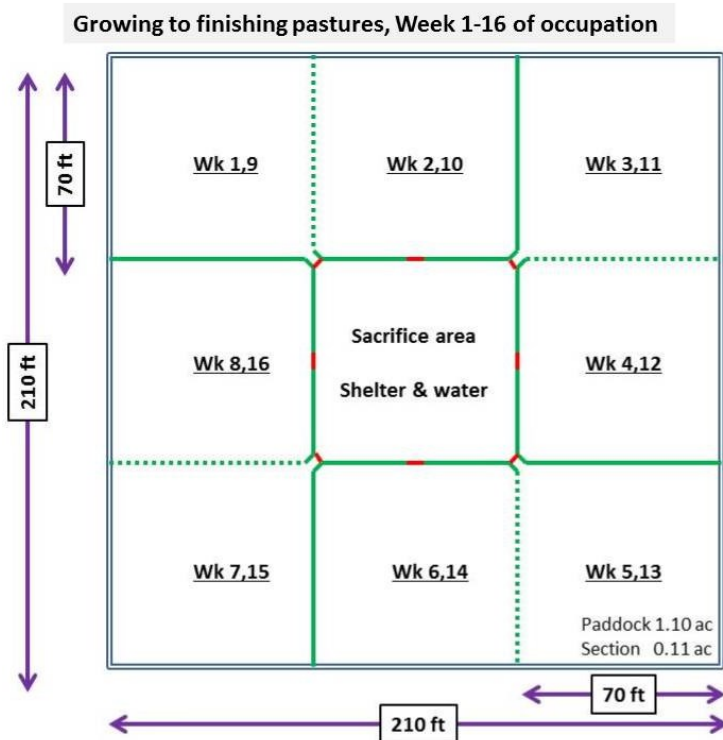
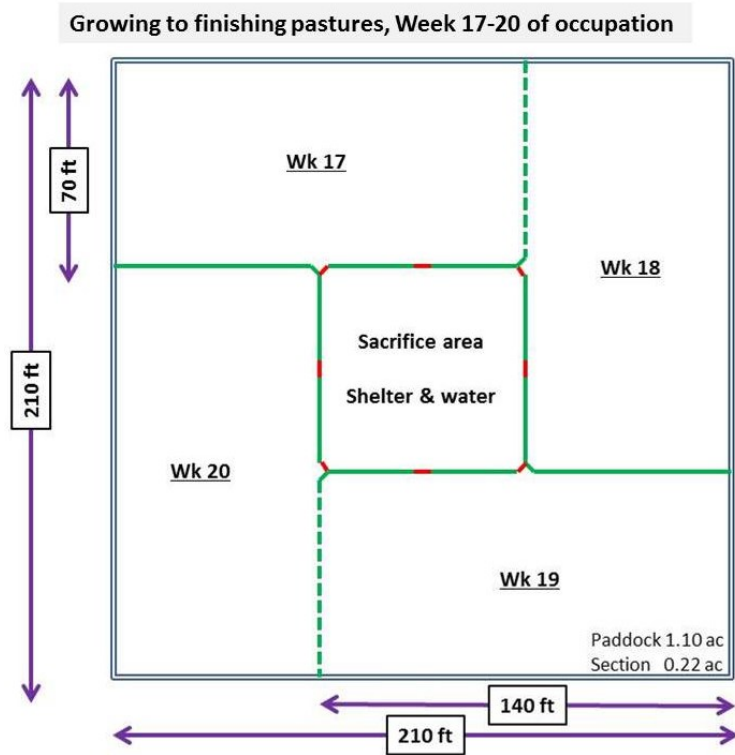
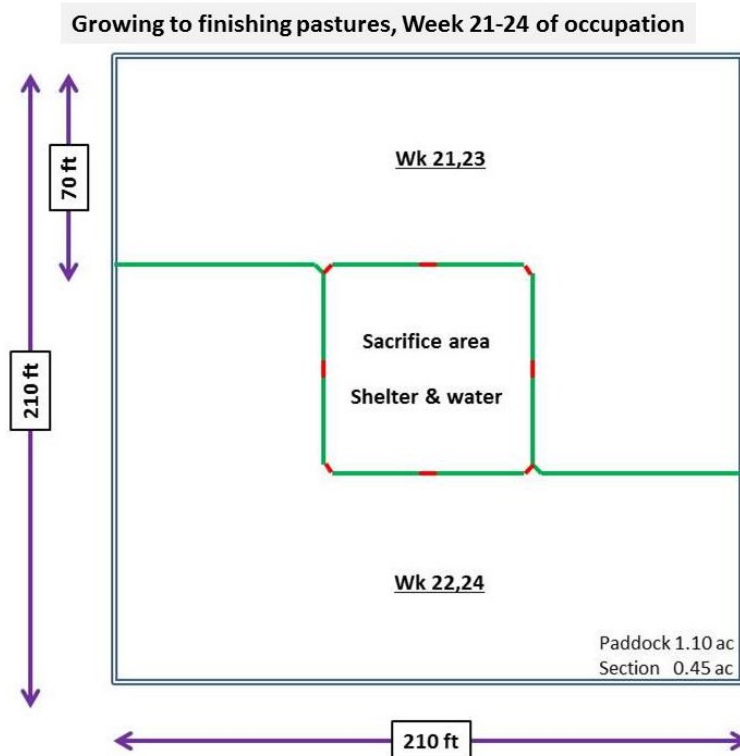


Figure 4. This one acre plot was divided in 9 sections, pigs will have access to the sacrifice area during the whole grazing period, and will have weekly access to one of the other 8 grazing sections, which will be grazed twice during this period. Dotted fence lines will be removed after week 16.

After week 16, pigs will have access to two sections in a weekly base. Dashed fence lines will be removed after week 20.



After week 20, pigs will have access to 0.45 ac in a weekly basis. These sections will be used twice.





Tall fescue pasture (0.42 ac) under rotational management. View of the sacrifice area at the end of the second growing cycle (12 weeks each). The stocking rate was equivalent to 20 hogs/ac (2600 lb/ac). Notice the location of shelter and drinkers and of the feeder in the grazing plot under use.

Growing to finishing pastures, Week 1 to 26 of occupation

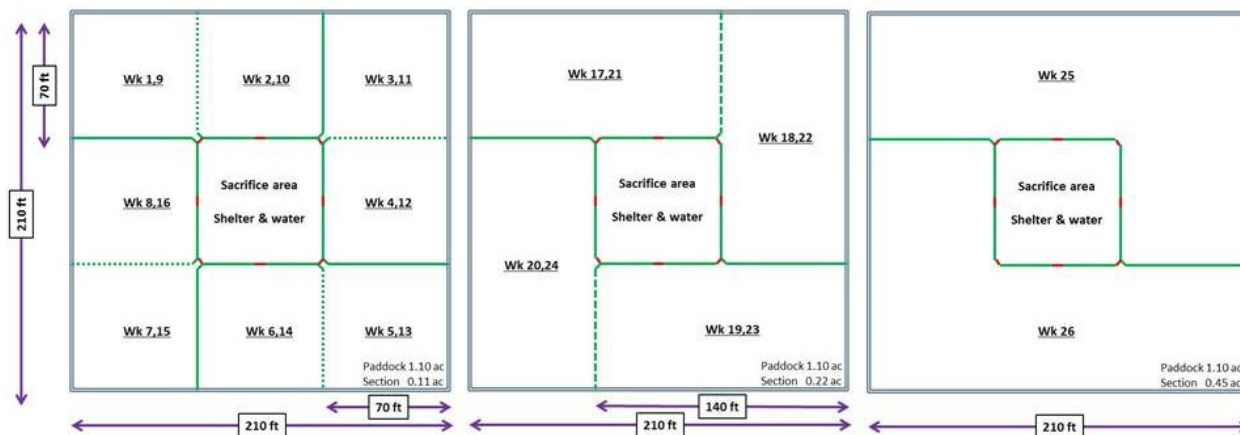


Figure 5. This example of pasture design allows for a 26 weeks growing to finishing period.

The Center for Environmental Farming Systems (www.cefs.ncsu.edu) is a partnership of North Carolina State University, North Carolina Agricultural and Technical University and the North Carolina Department of Agriculture and Consumer Services.

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