

Seed Germination Testing (“Rag-Doll” Test)¹

Jose Dubeux²

It is often important to determine the potential germination rate of seeds that have been held over from previous years. A fairly simple procedure can be conducted at home. Seeds that will not germinate in a “rag doll” most likely will not germinate in the field.

Properly used, the rag-doll test is very useful. After a simple, quick test, you will know if you need to buy new seed because the leftover seed has deteriorated, or if you need to plant at a higher rate because some reduction in germination has occurred and you recognize that you will not have ideal seedling vigour.

The following steps describe the “rag doll” test and provide suggestions for obtaining the most reliable results.

- Use a firm paper towel such as a brown hand towel or equivalent (the soft, very absorbent paper towels often used in a kitchen make poor rag dolls because they allow roots and shoots to penetrate into the fiber, making seedlings difficult to remove during counting). If no other type of towel is available, the soft towels can be used, but it is best to use a double layer. These towels often hold too much water, which drowns the seeds.
- Wet the paper towel and allow free water to drip off for a minute. Lay the wet towel on a clean surface (bleached if possible) and add seeds.
- Count out 100 seeds (50 for larger seeds like corn, peanuts, and soybeans) and place them on one half of the towel. Fold the towel over and roll it into a moderately tight tube. Rolling it around a pencil works well. If there is more than one rag doll, be sure to label each one. It works well to put a piece of paper with identification written in pencil in the upper margin of the rag doll. Either tie at the end to make a rag doll, or place the tube in a jar or sealable plastic bag.
- Position the rag doll so the tube is upright—doing this causes roots to grow down and shoots to grow up so that seedlings are more easily removed during counting. The rag doll should be kept in a warm place (between 75° and 85°F). A little water in the bottom of the jar or plastic bag ensures adequate moisture.
- Make the first germination count in about three days, for most crops. Open the towel and count the seedlings as you remove them. Fold and roll back into a tube. After another three to four days make another count. If you had 100 seeds, the number of seedlings removed equals the percentage germination. If you had 50 seeds, the number of seedlings removed multiplied by 2 equals percentage

1. This document is SS-AGR-179, one of a series of the Agronomy Department, UF/IFAS Extension. First published 1999, adapted by C. G. Chambliss from Production and Utilization of Pasture and Forages in North Carolina, *Technical Bulletin 305*, North Carolina Agricultural Research Service, North Carolina State University and is published with their permission. Revised September 2007 by Y.C. Newman. Reviewed May 2017 by Jose Dubeux. This publication is also part of the *Florida Forage Handbook*, an electronic publication of the Agronomy Department. For more information you may contact Joao Vendramini (jv@ufl.edu). Please visit the EDIS website at <http://edis.ifas.ufl.edu>.

2. Jose Dubeux, associate professor of forage management, Agronomy Department, UF/IFAS North Florida Research and Education Center, Marianna, FL 32446.

The use of trade names in this publication is solely for the purpose of providing specific information. UF/IFAS does not guarantee or warranty the products named, and references to them in this publication do not signify our approval to the exclusion of other products of suitable composition.

The Institute of Food and Agricultural Sciences (IFAS) is an Equal Opportunity Institution authorized to provide research, educational information and other services only to individuals and institutions that function with non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, marital status, national origin, political opinions or affiliations. For more information on obtaining other UF/IFAS Extension publications, contact your county's UF/IFAS Extension office.

U.S. Department of Agriculture, UF/IFAS Extension Service, University of Florida, IFAS, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. Nick T. Place, dean for UF/IFAS Extension.

germination. Germination time for most forage seeds is approximately between 7–20 days (Table 1).

- You can distinguish hard or firm (dormant) seeds from dead seeds by pushing down on each nongerminated seed with the flat part of a pencil eraser. If the seed does not flatten with gentle pressure, it is considered hard. Hard seeds are dormant and may germinate later on in the same season or next season. These are counted as good seed. Dead seeds are usually moldy at the end of the test and will flatten under an eraser.

Table 1. Seed germination time for common forage plants in Florida*.

Common Name	Approximate Germination Time (days)
Alfalfa	7
Alyceclover	21
Austrian Winter Pea	8
Bahiagrass	21
Clovers	7–10
Corn	7
Cowpea	8
Crabgrass (aged)	12
Dallisgrass	21
Indiangrass	21
Millet	7
Peanut	8
Ryegrass, annual	7
Small grains (Barley, Oats, and Wheat)	7
Sorghum	10
Soybean	7
Sudangrass	7
Switchgrass	21
Velvetbean (mucuna)	14
Vetch, hairy	10

*Adapted from Ball, Donald M., Carl S. Hoveland and Garry D. Lacefield, eds. *Southern Forages*, 3rd ed. Atlanta: Potash & Phosphate Institute, 2002.