

# Evaluation of Cultural Practices to Reduce Center Rot in Vidalia Onion

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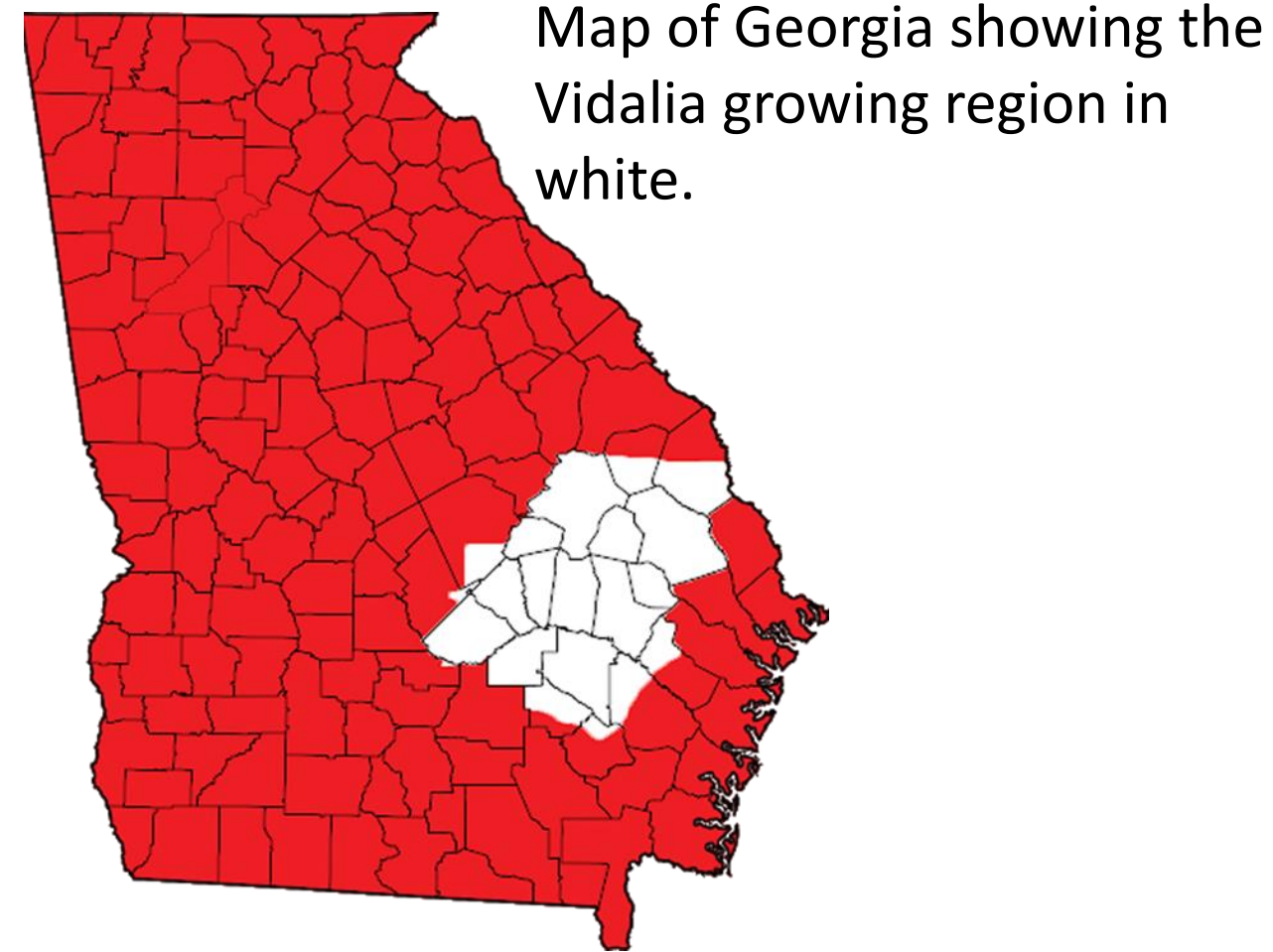
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## Introduction & Objectives



The picture above shows: A) Foliar symptoms of center rot, and B) internal bulb symptoms of center rot.



Map of Georgia showing the Vidalia growing region in white.

Vidalia Onions are grown in an area covering 17 counties in southeast Georgia. Center Rot (*Pantoea* spp.) is a bacterial disease of onion and the leading cause of losses in Vidalia Onions annually. Extension Agents and Specialists have evaluated cultural practices in the Vidalia Onion growing region to compare center rot incidence. Three independent studies were conducted to examine a specific cultural practice. In each study, onions were examined for Center Rot incidence after 1 month in refrigerated storage.

## Hand Clipping vs. Machine Harvest



The pictures above show the Top Air harvester used in the trial and the type of shears used to hand clip onions.

Onions from a commercial grower field were harvested in 2021 and 2022 with using two harvest methods, a Top Air mechanical harvester and hand shears. All onions harvested were previously dug with a chain digger and left to field cure for 10 days. The machine harvesting process includes mechanically picking up, top and root clipping, and placing the onions in a bin. Onion tops are left at a length of approximately 3-5 inches during this process. With hand clipping onions are picked up by hand, and the roots and neck are clipped to a length of 1 inch or less.

Methods of onion harvest	Internal rot (%) (2021)	Internal rot (%) (2022)
Mechanical harvest	4.5 B	3.0 B
Manual harvest	14.5 A	12.5 A
P-value	<0.001	0.002

## Chain Digger vs. Blade Undercutter



The pictures above show a typical chain digger and straight blade undercutter used in the Vidalia region.

Methods used to dig onions were also examined by comparing a chain digger to a straight blade undercutter. Randomized onion plots were set up at VOVRC to evaluate the equipment. Each year the onions were dug at maturity, which was approximately 30% tops down. The chain digger lifts the onions completely out of the ground, shakes the dirt off the roots, compacts and smooths the onion bed below, and lays the completely exposed bulb and roots on top of the compacted and smoothed bed. The straight blade undercutter is a simple blade that is pulled just under the surface of the soil, approximately 2 inches deep, and severs the roots from the plant. It loosens the bulbs from the ground slightly, but leaves soil attached to the bulb and leaves the bottom portion of the bulb and severed root in the soil.

Methods of onion digging	Internal rot (%) (2021)	Internal rot (%) (2022)
Chain digger	9.0 B	1.3 B
Straight-blade undercutter	20.5 A	10.7 A
P-value	<0.001	<0.001

## Comparing Clipped Neck Lengths



The neck on the bulb above was clipped at a length of 2 inches at harvest.

A study was conducted to evaluate the neck length at which onions are clipped with hand shears at harvest. In the trial, onions were dug at maturity and allowed to field cure. After field curing, onions were harvested by clipping the necks with hand shears at lengths of 0, 1, 2, and 3 inches. After a period of storage, the bulbs were evaluated.

Length of clipped neck	Internal rot (Center Rot) Incidence	
	2022	2023
0" neck	18.5 A	14.5 A
1" neck	18 A	4 B
2" neck	13 B	5.5 B
3" neck	13 B	6.5 B

## Results and Impact



A bag of Vidalia Onions in a grocery store in the summer of 2023. The picture shows a longer cut onion neck exposed from the bag. A recent survey indicates over 40% of growers have made modifications to clip their onion necks longer.



At a Vidalia Onion update in September of 2023, growers and industry professionals heard the latest information on cultural practices to reduce center rot. Over 85 participants were in attendance.

The data from these 3 studies suggests that modifications to grower cultural harvest practices can have significant implications for reducing center rot.

In the Vidalia region, the majority of the onions are harvested by hand with shears, but there is some interest among the industry in machine harvest. Vidalia Onions have a higher water content than onions grown in other regions, and there is concern about physical damage and bruising from machine harvesters, as well as logistical concerns with our short harvest window.

Chain diggers and straight blade undercutters are both widely used in the Vidalia region. In fact, many growers utilize both implements on their farms. Most growers prefer to use chain diggers, because they allow the onions to field cure better by removing the onion completely out of the soil, and they are aware of the benefits shown in this study. One downside to chain diggers is that they take longer to use than blade undercutters, so more time is required for their operation. Blade undercutters can dig more acres in less time and are often utilized when there is not sufficient time to use a chain digger.

Historically in the Vidalia region, onion necks are clipped short, somewhere between 0 – 1 inches in length. The neck length trial results have been shared with the industry over the last 2 years, and there is interest among growers about modifying their harvest practices. Results from a September 2023 survey among the industry show that over 40% of those surveyed have made efforts to train harvesters to clip onions at a longer neck length.

