DETERMINATION OF A SEQUENCE OF COLLARD PRODUCTION IN GEORGIA, NORTH CAROLINA, AND SOUTH CAROLINA*

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Abstract

Champion, Georgia, Heavincrop, and Vates collard varieties were planted on two spring and two fall dates from 1985 to 1987 in Fletcher and Lewiston, N.C., Charleston, Clemson, and Florence, S.C., and Attapulgus and Plains, Ga., to determine a collard production sequence in the three-state region. The first spring and last fall planting dates were considered to be the earliest and latest dates, respectively, for planting in each location. The cultivars yielded similarly when pooled over all planting dates, and no consistent superiority of a planting date was repeated in different years within each location.

Spring harvests in the three-state region occurred for about 11 weeks from midpril to early July. The sequence of production from first to last was: 1-Charleston, 2-Florence, 3-Attapulgus, 4-Plains and Lewiston, 5-Clemson, and 6-Fletcher. Summer to winter harvests occurred for about 22 weeks from mid-August to late January. The sequence of fall production from earliest to latest was: 1-Fletcher, 2-Lewiston and Clemson, 3-Charleston, 4-Plains, 5-Attapulgus, 6-Florence. Collards were not harvested in any location of the 7 locations for 11 weeks from late January to mid April and for 6 weeks from early July to mid-August.

Introduction

The growing season in the Southeast is as long as 290 days on the coast, dropping to 200 days in the mountainous areas of Georgia and the Carolinas. Three or four plantings of collards could be produced in certain areas of these states, but a major barrier to a production-marketing sequence involves the inability of producers to individually provide sufficient volume of product for a reasonable period of time (Epperson, 1982). A first step in developing a successful cropping system is the identification of cultivars that are adapted to the Southeastern region and to different seasons within the region. The range of adaptation of vegetable cultivars is the most difficult characteristic to assess, but it must be defined if the area for successful production is to be predicted (Cowie, 1984; Plaisted and Peterson, 1959). One possible approach in determining a range of adaptation for vegetable crops is to conduct yield trials in several locations for 2 or more years (Plaisted and Peterson, 1959).

Collards are already produced in the Southeast but a concerted effort to develop a production sequence scheme has not been attempted. Such information would strengthen the development of a unified collards production industry in the three-state region. The objective

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of this study was to determine the sequence of planting and harvesting of collards throughout the spring and fall growing seasons in Georgia, North Carolina, and South Carolina.

**Materials and Methods**

Seven Southeastern locations were chosen for the field evaluations that range in length of planting season from those similar to northern Florida (Attapulgus, Ga.) to those similar to southern Ontario (Fletcher, N.C.) (Figure 1). The wide range of climates should allow collard production for a major portion of the year. The locations and general descriptions were as follows: a) Mountain Horticultural Research Station, Fletcher, N.C.; southern Appalachian mountains; b) Peanut Belt Research Station, Lewiston, N.C. - tidewater coastal plain; c) Clemson Bottoms Research Site, Clemson, S.C. - upper piedmont; d) Pee Dee Agricultural Research and Extension Center, Florence, S.C. - central upper plain; e) Coastal Research & Education Center Charleston, S.C. - lower eastern coastal plain; f) Coastal Plain Experiment Station, Plains, Ga. - central western coastal plain; g) Georgia Extension and Research Station, Attapulgus, Ga. - lower southwestern coastal plain. Two spring and two fall planting dates were chosen for each location (Table 1).

Four cultivars of collard, Champion, Georgia, Heavicrop, and Vates, were evaluated in each location. Cultivar choice was based on commercial standards and previous variety evaluations. Uniform plot size, experimental design, grading standards, and data collection were used in all locations. Individual plots were 6.1 m long and on 1.8 m centers. Three rows of collard transplants were planted 20 cm apart within each plot. A Latin square design with four replications was used. Irrigation, fertilization (based on soil tests), and accepted pest management practices were used in all locations. Collards were harvested when plants produced at least 18-20 leaves. Total marketable weight and number of plants were recorded in each plot. Data were analyzed by analysis of variance; means were separated with LSD at the 5 percent level if the F test was significant.

**Results and Discussion**

Generally, the mean yield responses of all four cultivars pooled over planting dates did not indicate any significant differences among cultivars (Table 2). Also, choice of cultivars and spring or fall planting dates was not considered to be critical production consideration in any of the locations, and consistent superiorities of planting dates and cultivars within locations were not apparent.

Overall pooled yields for variety, planting date, and year data indicated that Lewiston and Fletcher, N.C., produced the highest yields of all; whereas yields were lowest at Plains, Ga., and Charleston, S.C. (Table 2). Production at Clemson and Florence, S.C., and Attapulgus, Ga., were intermediate. The cooler nighttime temperatures in the northern locations may have been responsible for lower respiration rates and subsequently higher biomass production.

Although yield potentials were higher in some of the northern locations relative to others, collards can be produced in some area of the region during the majority of the year. Figure 2 illustrates the ranges of planting and expected harvest spans based on 2 to 3 years of production research.

**Table 1. Location* of collard plantings from spring 1985 to spring 1987.**

<table>
<thead>
<tr>
<th>Planting Date</th>
<th>Georgia Plains</th>
<th>South Carolina Chas</th>
<th>South Carolina Clem</th>
<th>South Carolina Flor</th>
<th>North Carolina Flet</th>
<th>North Carolina Lewis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985 Spring 1</td>
<td>10/22*</td>
<td>9/10</td>
<td>9/24</td>
<td>10/1</td>
<td>5/1</td>
<td>7/15</td>
</tr>
<tr>
<td>1986 Spring 1</td>
<td>10/1</td>
<td>9/10</td>
<td>9/24</td>
<td>10/1</td>
<td>5/1</td>
<td>7/15</td>
</tr>
<tr>
<td>1987 Spring 1</td>
<td>2/1</td>
<td>2/20</td>
<td>2/26</td>
<td>3/5</td>
<td>4/22</td>
<td>3/15</td>
</tr>
</tbody>
</table>

*Atta=Attapulgus, Ga; Chas=Charleston, S.C.; Flor=Florence, S.C.; Flet=Fletcher, N.C.; Lewis=Lewiston, N.C.; Clem=Clemson, S.C.

*Plantings made but lost due to freezes.
Spring harvests in the three-state region occurred steadily in one of the seven locations over a period of 11 weeks from mid-April to early July (Fig. 2). Harvests began in the lower coastal areas, moved into the central coastal plains, and terminated in the upland and mountain regions. Planting of collards in spring began as early as February in Charleston, S.C., and Attapulgus, Ga., and terminated in Fletcher, N.C., as late as mid-May. The earliest spring harvests commenced in Charleston from mid-April to late May. Then, next in the sequence, harvests began in Florence, S.C., followed by Clemson S.C., Plains, Ga., and Lewiston, N.C., occurring at about the same time. Although only two spring planting dates were screened each year to bracket seasonal plantings, it is suggested that planting dates between these extremes would produce a crop within the harvest spans presented.

The planting of fall collards occurred as early as 15 July to 1 August in Lewiston and Fletcher, N.C., followed in a stepwise fashion by Clemson, S.C. (15 August), Florence (1 Sept.), and Charleston, S.C. (10 Sept.) (Figure 2). The latest plantings were made in Plains, Ga., (late Sept. to late Oct.) and Attapulgus, Ga., (early Oct. to late Nov.). Fall production, spanning approximately 5 1/2 months, extended from mid-August in the mountains to the uplands and northern locations, to late January in the central coastal and southern coastal locations. Fall production began in Fletcher in mid-August, terminating by late September. Next, Lewiston and Clemson followed in late September continuing until early December and late November, respectively. Charleston production began 1 November and terminated on 1 January. Harvests began in Plains, Ga., in late November and continued until late January. The latest harvests of the season were in Attapulgus from early December until late January. Since only one fall planting occurred in Florence, prediction of seasonal harvest length is not possible. Collards planted the first part of Sept. in Florence were harvested in mid-December.

The three-state region did not supply collards for approximately 11 weeks in late winter/early spring (approximately 20 January to 15 April) and 6 weeks in summer (approximately 5 July to 15 August). Further work is needed in the three-state region to determine if other cultivars and/or cultural practices can be used to extend the production into these void production times to strengthen market position.

This study has demonstrated that the wide range of environmental conditions present in Georgia and the Carolinas can be used advantageously to produce collards for the majority of the year and the region may capture a large share of the eastern greens market with concerted regional cooperation.

**Literature Cited**


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Table 2. Production of collards in seven southeast locations from 1985 to 1987.

<table>
<thead>
<tr>
<th>Location</th>
<th>Yield (MT/ha)</th>
<th>Yield (tons/acre)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fletcher, NC</td>
<td>38.8 a</td>
<td>17.3 a</td>
</tr>
<tr>
<td>Lewiston, NC</td>
<td>36.7 a</td>
<td>16.4 a</td>
</tr>
<tr>
<td>Clemson, SC</td>
<td>33.2 ab</td>
<td>14.8 ab</td>
</tr>
<tr>
<td>Attapulgus, GA</td>
<td>28.1 b</td>
<td>12.5 b</td>
</tr>
<tr>
<td>Florence, SC</td>
<td>27.9 b</td>
<td>12.4 b</td>
</tr>
<tr>
<td>Charleston, SC</td>
<td>24.6 c</td>
<td>11.0 c</td>
</tr>
<tr>
<td>Plains, GA</td>
<td>22.8 c</td>
<td>10.2 c</td>
</tr>
</tbody>
</table>

* Pooled averages of Champion, Georgia, Heavycrop, and Vates cultivars grown as spring and fall crops.

* Means separated by LSD .05.
Figure 1. Locations of collard adaptation research.

Figure 2. Sequence of collard planting and harvesting in seven Southeastern locations based on 1985-1987 production studies.