

# Rose Clover Evaluation and Selection

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## Summary

Nineteen rose clover plants were selected from a spaced plant nursery in 1982-83 based on ratings for maturity and forage potential. Progeny from these selections were compared in replicated rows to parental lines and commercial checks in 1983-84. Ten superior rose clover lines were identified for further testing. All 10 lines were rated as better forage types than the commercial varieties. All 10 lines were also later in maturity than Kondinin and Hykon and ranged from slightly earlier to slightly later in maturity than Wilton.

## Introduction

Rose clover (*Trifolium hirtum* All.) is a winter-annual legume adapted to a wide range of soil types. Rose produces seed similar in size to crimson clover with a high percentage of very persistent hard seed. No major disease or insect pests have been noted on rose clover in Texas. Presently, Hykon and Kondinin are the only certified commercial varieties widely available. Both of these varieties are too early in maturity to take full advantage of our growing season in East Texas. Wilton rose clover is no longer available as certified seed, but the 'Wilton' type can be purchased as California common rose clover.

Objectives of the rose clover breeding program at Overton are: (1) development of highly productive, late maturing (mid-May) rose clovers; and (2) maintenance of persistent hard seed and pest resistance traits in new germplasm.

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KEYWORDS: Rose clover/reseeding/breeding/selection.

## Procedures

Three hundred and eight seedlings of rose clover were transplanted to a spaced plant field nursery on November 15, 1982. Rose clover variety Wilton and plant introductions 287973, 311483, 287975, and 311485 were the germplasm base for this nursery. Soil pH was 6.8 (0-6 inches). Soil test ratings of phosphorus and potassium were low and very low, respectively. Prior to transplanting, 450 lb/A of 0-20-20 were applied to the Sawtown fine sandy loam soil. In early January 1983, plants showing winter freeze injury (23 percent of the nursery) were removed. In March and April the remaining plants were rated for maturity and forage potential. Based on these ratings, 18 rose clovers lines were identified for further evaluation (Table 1).

These 19 selections and their parental lines were planted at Overton in 3-ft rows on October 26, 1983. Seeding rate was 0.5 g/row of inoculated (Nitrogen type WR with Pelgel) seed. Experimental design was a randomized complete block with two replications. Two evaluators rated the rose clover lines for stand, maturity, and forage potential in March and April 1984. Ten superior lines were identified (Table 2). Seed were harvested at maturity and a subsample was hand-cleaned for hard seed determination. Percent hard seed was measured by placing 200 seed from each line on moist germination paper in petri dishes (50 seed/dish, four dishes). The germination paper was checked daily and kept moist with deionized water. After 10 days unimbibed seed were counted as hard seed (Table 2).

**TABLE 1. ROSE CLOVER SINGLE PLANT SELECTIONS FROM 1982-83 NURSERY**

1982-83 Nursery ID	Origin	April 29, 1983	
		Maturity <sup>1</sup>	Forage Potential <sup>2</sup>
B19	Wilton	2	4
E12	Wilton	2	4
H18	311483	2	5
I2	Wilton	2	4
R12	Wilton	2	4
H4	311483	2	4
A1	287973	3	5
A2	287973	3	5
D3	311485	2	3
D17	311485	3	5
D19	311485	3	5
E3	Wilton	3	5
F20	287973	3	5
H1	311483	3	5
H7	311483	2	3
J3	287973	3	5
M13	311485	3	5
M16	311485	2	3
O15	287973	3	5
<b>Range</b>		2-5	1-5

<sup>1</sup>1 = vegetative; 2 = early bud; 3 = late bud; 4 = early bloom; 5 = full bloom.

<sup>2</sup>5 = very leafy, vigorous plant; 1 = very stemmy, low vigor.

**TABLE 2. ROSE CLOVER SELECTIONS, PARENTAL LINES, AND CHECKS FROM 1983 to 1984 SEEDED ROWS**

1983-84	1982-83	April 26, 1984					
Entry No.	Nursery ID	Origin	Vigor <sup>1</sup>	Stand <sup>2</sup> Percent	Maturity <sup>3</sup>	Height <sup>4</sup> inches	Hard Seed <sup>5</sup> Percent
17	H7	311483	4.1	99	2.7	8.5	81.0
18	J3	287973	4.4	98	3.0	10.5	59.5
21	F20	287973	4.1	91	3.0	9.0	70.5
22	015	287973	4.8	96	3.0	11.5	76.7
23	D3	311485	4.6	92	2.5	10.0	66.7
24	D17	311485	4.3	97	3.0	9.5	68.7
26	M13	311485	5.0	99	3.0	12.0	66.0
27	M16	311485	4.4	96	2.7	10.5	66.0
13	R12	Wilton	3.8	92	1.7	5.5	75.2
14	H18	311483	3.7	81	2.0	7.5	54.5
1	—	Wilton	2.3	45	2.2	4.0	82.7
2	—	Hykon	1.1	56	5.0+	4.5	88.0
3	—	Kondinin	1.4	67	5.0+	6.0	88.2
4	—	287973	4.0	96	2.7	9.0	75.0
5	—	311485	4.3	83	3.0	11.0	75.7
6	—	287975	3.7	89	3.7	8.0	76.5
7	—	311483	3.5	74	3.0	9.0	77.5

<sup>1</sup>5 = vigorous, leafy plant; 1 = stemmy, low vigor plant (mean of two evaluators and two replications).

<sup>2</sup>Mean of two evaluators and two replications.

<sup>3</sup>1 = vegetative, 5 = full bloom (mean of two replications).

<sup>4</sup>Mean of two replications.

<sup>5</sup>Mean of four replications.

## Results and Discussion

Five hundred and twenty-three annual clover plant introductions were evaluated by Shipe and Rouquette at Overton in 1976-77 for stand establishment, seedling vigor and growth rate. From these original plant introductions rose clover was identified as one of several clovers with potential for improvement and use in Texas. This species is primarily self-pollinated but the percentage of outcrossing is enough (5 percent) for variation to occur within and among lines.

The final 10 selections made from the 1984 seeded rows consist of three lines from P.I. 287973, four lines from 311485, two lines from 311483 and one line from Wilton. In general, these 10 selections were rated better than the commercial varieties for vigor or forage potential and were later in maturity than Hykon or Kondinin. The selections ranged from slightly earlier to slightly later than the variety Wilton. Hard seed percentage ranged from 81 to 54 percent for the selections and 88 to 82 percent for the commercial varieties (Table 2).

Further testing is in progress to determine the relative persistence of hard seed produced by the rose clover selections and commercial varieties. Observation trials are in progress at eight locations in Texas to determine adaptation and forage potential of the 10 rose clover selections compared to commercial varieties. Seasonal forage production studies and seed increases of the rose clover selections are in progress at Overton. Animal production on reseeded stands will be the final test for one or two of these rose clover selections. With good seed increases, grazing evaluations can begin in 1985 or 1986.