

‘UFWC- 5’ White Clover (Southern root-knot nematode tolerant)

The White Clover cultivar is available for exclusive license in the territory of the United States of America: Approximately 3 pounds of pure Breeders supplied seed is immediately available for initial bulk planting.

White clover is the most widely grown *Trifolium* species in the world. This legume produces excellent forage yields in winter grazing systems of the southeastern US. Early evaluations in the southern US determined that the ladino types offered much better forage yields than either the small or intermediate types. Ladinos are characterized by large plant type, high vegetative vigor, and less flowering compared to the other growth habits types. During the development of the cultivar ‘Osceola’, RKN tolerance and flowering were major selection criteria since reseeding is important for persistence and for commercial seed production.

Osceola, like all other ladino cultivars, is very susceptible to species of root-knot nematodes (RKN). These pathogens cause reductions in yield and greatly contribute to stand decline under field conditions. A phenotypic recurrent selection program was initiated to develop a new ladino cultivar with increased tolerance to this pathogen while maintaining the positive attributes of Osceola (yield and flowering). The result of this work was a cultivar that was tested under the name UFWC - 5 white clover.

In field trials at 4 locations in Florida, UFWC - 5 performed very well in comparison to Osceola and other white clover cultivars. In a 2 year trial at Jay, Florida, yield of UFWC - 5 was not different from Osceola and both were significantly better than all other entries except for Will. In 3 years at Gainesville, forage yields of Osceola and UFWC - 5 were not different for any year. Compared to other ladinos for yield, UFWC - 5 either was not different from them or was better than them. During 2003-04, UFWC - 5 significantly outyielded both Patriot and Durana which are commercially marketed intermediate types. Flowering was evaluated during all these Gainesville trials and no differences were detected between Osceola and UFWC - 5 except for the 2003-2004 growing season where UFWC - 5 had significantly more flowers than Osceola.

In field trials at the RCREC in Ona, FL, UFWC - 5 yielded equal to all other ladino types, including Osceola, and significantly better than Durana. Also included in the trial at this location were entries for red clover and UFWC - 5 yielded equal to all of these cultivars. In a field trial at NFREC at Marianna, UFWC - 5 led all entries in forage yield, however, it was not significantly better than Osceola. UFWC - 5 produced significantly yield more yield than both Durana and Patriot at this location.

In greenhouse studies to evaluate improvement in nematode tolerance, UFWC - 5 was significantly more tolerant than Osceola. In studies conducted the first year, UFWC - 5 plants inoculated with the RKN produced more top growth and root growth than inoculated Osceola plants and also had significantly less root damage and plant mortality caused by the RKN. During the second year of evaluations, 3 different isolates of RKN were used to compare for plant response to isolates of different pathogenicity. The results clearly demonstrated that UFWC - 5 had significantly lower levels of infection and lower rates of nematode reproduction for all 3 isolates as compared to Osceola. All parameters revealed that UFWC - 5 was significantly more tolerant to damage caused by RKN than Osceola and nematode reproduction was approximately 700% lower on UFWC - 5 than on Osceola. The combinations of lower initial RKN infection and lower RKN reproduction indicate a significant advantage in field conditions where RKN exists.

With forage yield and flowering equal to Osceola under optimum field conditions, UFWC - 5 is a well-performing ladino white clover cultivar. In the trials conducted for this work, UFWC - 5 had equal or better forage yield than any other cultivar tested. UFWC - 5 has significantly improved RKN tolerance compared to Osceola or any other white clover cultivar. This attribute should enhance the productivity and longevity of field stands of UFWC - 5 compared to other white clovers. Since the excellent flowering of the source cultivar was maintained during the development of UFWC - 5, it will be a very productive yielder in commercial seed fields.

Table 1. Forage yields (lbs/a) for white clover populations during 2003-2004 at the Agronomy Forage Research Unit (Gainesville, FL).

Entry	Harvest 1	Harvest 2	Harvest 3	Total Yield
UFWC -5	1274	1227	253	2754

Osceola	907	1102	259	2268
Regal	961	1087	269	2317
Patriot	508	953	72	1527
Durana	568	991	38	1598
LSD (0.05)	140	133	55	260

Table 2. Second stage larvae counts 8 weeks after inoculation with three isolates of southern root-knot nematode for UFWC - 5 and Osceola in a greenhouse test.

<u>Entry</u>	<u>Mean</u> ¹
UFWC -5	65
Osceola	469

Table 3. Second stage larvae counts 16 weeks after inoculation with three isolates of southern root-knot nematode for UFWC - 5 and Osceola in a greenhouse test.

<u>Entry</u>	<u>Mean</u> ¹
UFWC -5	212
Osceola	1482

¹ Means differ at the 0.05 % level of probability according to DNMR test.

Figure 1. A replication of plants for Osceola (left) and **UFWC -5** (right) 16 weeks after inoculation in a greenhouse study.

