

Star White Clover



R. D. Ensign

LIBRARY
AUG 17 1987
UNIVERSITY OF IDAHO



Agricultural Experiment Station

University of Idaho

College of Agriculture

Star White Clover

R. D. Ensign

Star white clover, *Trifolium repens* L., was developed by the Idaho Agricultural Experiment Station and released jointly by Oregon and Washington Experiment Stations in 1981. It was tested experimentally as Synthetic A (Ensign 1981).

Star white clover is best adapted to areas with cool, moist climates and for seeding in well-drained, neutral pH, loam soils with adequate seasonal moisture. White clovers grow well as a pasture legume mixed with grasses under irrigation in the intermountain areas of the West and in the Pacific Northwest. White clovers also grow well in the humid East and southeastern areas of the U.S., and in the mild, humid, cool climate of New Zealand. There it is grown with perennial rye grasses and is the basis of their grassland agricultures. White clover is one of our most widely grown pasture legumes. It is palatable, digestible and highly nutritious to all livestock.

Breeding and Plant Description

Star is a synthetic cultivar with 10 highly self-sterile clonal links as parents. These were derived from more than 30 older cultivars and seed lots of white clover produced in Idaho. All clones were reselected on the basis of superior seed production of their polycross

Cover Photo — Typical Star White Clover plant showing profuse flowering habit.

The Author — R. D. Ensign, professor emeritus in the Department of Plant, Soil and Entomological Sciences, formerly led the UI research project to develop improved bluegrass and fescue cultivars for turf.

progeny. The best criterion for potential seed production was the number of flowering heads per square yard.

The 10 clones making up Star ranged from the small-leaf Kentish type to the large-leaf Ladino type. Half of the 10 clones were small to intermediate leaf type, 3 were intermediate and 2 were the large leaf type. The Syn-2 progeny are intermediate to medium leaf type. In tests at Moscow, 46 percent of the leaves had full-V white leaf marking, 35 percent filled-V, 3 percent broken-V and 3 percent V-point. Only 13 percent had no white leaf marking. Red anthocyanic leaf marking was observed on 40 percent of the Syn-2 leaves.

Forage and Seed Production

Star, an intermediate-type white clover, is not considered to be a high hay- and forage-producing legume when compared to the ladino-type white clovers. Idaho data indicate, however, that Star is equal to Idaho Common white clover in forage and superior to Tillman, Tamar and Merit (Table 1). The large number of flowering heads that Star produces may be the reason for superior forage yields in these tests. Forage production data from other areas of the U.S. are limited.

Star white clover is a relatively early flowering cultivar, averaging 2, 3 and 14 days earlier in Idaho than LA S-1, Idaho Common and Merit, respectively. Star flowered 8 days earlier than the New Zealand Grasslands Huia and Pitan cultivars at Moscow.

Star produced 252, 204 and 123 percent more blossoms during the peak flower period than Tillman, Merit and Idaho Common, respectively. Profuse heads of Star white clover contribute to superior seed productivity in comparison to other cultivars tested in Idaho

Table 1. Plant characteristics of Star compared with other white clovers at Moscow, ID.

Cultivars	Plant width (----- inches -----)	Plant height ¹	Head count ¹ (No/yard) ²	Seed yield ² (% of Common)	Forage ³ (lb/acre)	Leaf marking (----- score -----)	Plant-leaf type
Star (Syn A)	21	10	154	138	5,445	variable ⁴	Intermediate-large
Tillman	18	8	61	44	3,176	100% full V	Large
Tamar	14	7	17	50	4,083	100% full V	Intermediate
Lucky Ladino	20	9	69	82	3,176	None	Large (Ladino)
Merit	26	9	75	90	3,630	80% full V	Large (Ladino)
Huia	23	7	63	94	4,991	100% full V	Intermediate
Idaho Common	21	8	125	100	5,445	60% full V	Small-intermediate

¹Mid July 1979-81, 5 replications 5 plants/replication

²Early August 2 years

³Mid June 2 years average D.M. production

⁴87% full V, filled V or broken V white markings, and 13% none



Fig. 1. R. D. Ensign standing among plots of 'Star' white clover at the University of Idaho Plant Science Farm, Moscow.

(Fig. 1). The correlation coefficient of 0.86 ($P < .05$) indicates a significant relationship between number of heads and seed yield of white clovers (Table 1).

Seed Certification

Star has been approved for certified seed production in Idaho and adjoining states through cooperative agreements with the certifying agencies. Star is a registered plant variety protected (PVP) cultivar with Certificate 8100173. The University of Idaho maintains breeder seed production at Moscow, Idaho. Foundation and certified seed production has been contracted with an Idaho seed company that in turn contracts seed production with seed growers in the Northwest. The certificate application states that Star name can be used only for seed sold as a class of certified seed.

Diseases

Star white clover is susceptible to several viruses including White Clover Mosaic Virus (WCMV), Alfalfa Mosaic Virus (AMV) and Clover Yellow Mosaic Virus (CYMV). These viruses are common in older white clover fields in Idaho and are readily transmitted by cutting tools or other mechanical means. The viruses are not considered to be seed borne. All clones making up the synthetic breeders field are maintained

in the greenhouse in a disease-free state. All virus-infected clones were readily freed of virus by meristem culture.

White clovers are affected by *Sclerotinia* and *Fusarium* spp. and some leafspot diseases in the Pacific Northwest. Cultural practices may limit extensive damage by some of these diseases. Stem nematode, root-knot nematode and clover cyst nematode also attack white clover. Star's susceptibility to these pathogens has not been determined.

Research by Pederson (1985) has indicated that Star possesses tolerance to leaf toxins produced by tall fescue, a grass commonly grown with white clover for forage production in the southeastern United States. These toxins reduce germination and root growth in most white clover cultivars. The degree of tolerance of Star to these allelopathic effects has not been ascertained.

References

- Ensign, R. D. 1981. Registration of Star White Clover (Reg. No. 5). *Crop Sci.* 21:631-632.
- Pederson, G. A. 1985. Allelopathic effects of tall fescues on germination and seedling growth of white clover genotypes. *Proc. 15th Int. Grassland Conf.* Kyoto, Japan.



SERVING THE STATE

Teaching . . . Research . . . Service . . . this is the three-fold charge of the College of Agriculture at your state Land-Grant institution, the University of Idaho. To fulfill this charge, the College extends its faculty and resources to all parts of the state.

Service . . . The Cooperative Extension Service has offices in 42 of Idaho's 44 counties under the leadership of men and women specially trained to work with agriculture, home economics and youth. The educational programs of these College of Agriculture faculty members are supported cooperatively by county, state and federal funding.

Research . . . Agricultural Research scientists are located at the campus in Moscow, at Research and Extension Centers near Aberdeen, Caldwell, Parma, Tetonía and Twin Falls and at the U. S. Sheep Experiment Station, Dubois and the USDA/ARS Soil and Water Laboratory at Kimberly. Their work includes research on every major agricultural program in Idaho and on economic activities that apply to the state as a whole.

Teaching . . . Centers of College of Agriculture teaching are the University classrooms and laboratories where agriculture students can earn bachelor of science degrees in any of 20 major fields, or work for master's and Ph.D. degrees in their specialties. And beyond these are the variety of workshops and training sessions developed throughout the state for adults and youth by College of Agriculture faculty.



Published and distributed by the
Idaho Agricultural Experiment Station
Gary A. Lee, Director
University of Idaho College of Agriculture
Moscow, Idaho 83843

The University of Idaho offers its programs and facilities to all people without regard to race, creed, color, sex or national origin.