

Turf cut to a height of $1\frac{1}{4}$ inches was greener and more vigorous than that cut at three-fourths of an inch, and there was slightly more clover in the longer turf.

CAN GRASSES BE HYBRIDIZED?

Plant improvement generally is achieved by one of several methods, perhaps the two most common being by selection and perpetuation of the most desirable individuals and by hybridization. The improvement of turf grasses so far has been accomplished largely by the process of selection, but the possibility of hybridizing has not been overlooked. In 1937 and 1938 Walter Hertzsch in Germany made 57 crosses between various species of fescue, ryegrass, brome, wheatgrass and others. The results of these crosses, as published in *Der Züchter*, are not encouraging. He emasculated and cross-pollinated nearly 16,000 flowers in making these crosses, and a total of only 333 seeds were set. In 42 of the 57 crosses no seeds were set, and in 5 there was just one seed set.

Most of the grasses used were pasture grasses, but numerous crosses were tried with *Festuca rubra*. When it was used as the male parent crossed on *Festuca pratensis*, only 8

seeds were developed out of 765 crosses. However, when used as the male parent crossed on *Lolium perenne*, 41 seeds were produced out of 303 crosses. No seeds were produced when *Festuca rubra* was used as the female plant.

LOSS OF VIABILITY IN NEW ZEALAND CHEWINGS FESCUE

Decline in the germination capacity of Chewings fescue seed during shipment from New Zealand to the northern hemisphere has for many years been a constantly recurring trouble. In spite of this fact, our annual import totals have remained reasonably steady. American buyers appear to have accepted Chewings fescue seed as being delicate and short-lived, and, although periodic complaints have followed unsatisfactory deliveries, particularly in unfavorable seed production seasons, the demand has been well sustained.

Many theories have been advanced, both in the United States and abroad, as to the causes of deterioration of grass seed during shipment, but results from experimental work have shown that it is largely due to unfavorable conditions of shipment. These unfavorable shipping conditions, to which seed of Chewings fescue was found to be particularly

susceptible, were high temperature and humidity in the ship's hold. Although no reliable data concerning temperature and humidity in ships' holds are available, it is known from observation that both are invariably high.

Foy carried on experiments on the effect of temperature and moisture content of seed on viability and presented his results in the *New Zealand Journal of Agriculture*. Reference to this article is made on page 4 of this issue. Foy's results showed that high temperature, together with high moisture content of the seed, effected a rapid decline in germination capacity. He found that when one of these conditions was at normal level and the other unfavorable, a slow

loss in viability followed, and that when one condition was extremely favorable the other might be very unfavorable without causing harmful results.

A temperature of 104° F. was considered the average for a ship's hold in the tropics and 13 percent as the normal moisture content of Chewings fescue seed.

The results of Foy's experiments are shown in the table below. It will be noted that the moisture content of the seed was the more important factor. At a moisture content of 5 percent there was practically no loss of viability at any temperature; at moisture contents of 13 and 20 percent there was sooner or later a loss of viability at each temperature.

RESULTS OF STORAGE OF CHEWINGS FESCUE SEED WITH INITIAL GERMINATION CAPACITY OF 98 PERCENT. THE NUMBER OF DAYS OF STORAGE ARE GIVEN IN PARENTHESES AT THE HEAD OF THE COLUMNS SHOWING PERCENTAGE OF GERMINATION CAPACITY.

Storage temperature °F.	Moisture content of seed Percent	Percentage of germination capacity					
		(1)	(7)	(14)	(21)	(35)	(42)
122	5	97	97	98	97	98	97
122	13	96	9
122	20	94
104	5	98	97	98	98	96	98
104	13	96	73	38	21	15	10
104	20	94	66	12	2	1	..
86	5	98	98	98	98	97	96
86	13	97	85	82	85	79	75
86	20	95	79	57	39	10	5