The introduction of Zoysia species from the Orient into the United States, and the recognition of their possible value as turf-forming grasses has stressed the desirability of developing superior turf varieties by breeding and selection.

A search of the literature dealing with the Zoysia spp. revealed almost a total lack of information concerning the cytology and genetics of these grasses. No information was available on meiosis, interspecific hybrids, self or cross-fertility, inheritance, or any other aspect of sexual reproduction. Only one investigator has ever attempted to determine the chromosome number of a species in this genus (7). The taxonomy and distribution of these grasses have been treated more fully, but even in this respect, the genus has escaped any concentrated study. As a result, the number of species recognized and their distribution is somewhat uncertain. The lack of cytogenetic information, which is essential for the improvement of these species by breeding, has necessitated this investigation.

The objectives of this preliminary study were: to determine the chromosome number of the introduced species of Zoysia, to determine whether interspecific hybrids can be produced from them, and to develop practicable breeding techniques for these grasses.

This report covers two seasons of work, 1947-48 and 1948-49. A preliminary study of flowering habit and breeding technique was conducted in the greenhouse during the winter of 1947-48. Interspecific hybridization and cytological studies were carried on during the winter of 1948-49.

REVIEW OF LITERATURE

Darlington and Janaki Ammal (7), in their comprehensive catalogue of chromosome numbers, listed only one 2n chromosome count in the genus, "Zoysia matrella—c. 40—Thomas unpub."

In their legend they stated, "Where the author is uncertain, we prefix c. (circa)." This inconclusive count appears in cytological information available. Myers (17) lists some counts in the tribe Zoysieae; (Tragodoma racemosa 2n=40, and Anthephora hermaprodita (L.) K. Koch wrote further that, "Chromosome numbers of the tribe Zoysieae, Chlorideae, Phalarideae, Zizanieae, and Melinideae are known to indicate the predominant basic number."

No record was found of any attempt to produce hybrids in Zoysia. The only available information of breeding technique, was the observation by Childers (b) that Z. matrella is a short day plant.

Literature dealing with the classification and Zoysia spp. is somewhat inconclusive with regard of species involved. No doubt the broad natural distribution and the isolation describing the same species under different names, has resulted in much synonymy. Index Kewensis (14) seems to bear out this supposition, as it lists 10 synonyms for Z. japonica, Z. matrella, and Z. pungens. Hitchcock (12) and Bews (1) both recognize the species: Z. japonica Steud., Z. matrella (L) Merz., and Z. pungens Willd. In addition, Bews indicated that there were "four or five species," and Hitchcock, in (11) said that there were "about five" species.

Hitchcock (12) gives the following descriptions:

Zoysia Willd. (Osterdania Neck.) Spikelets usually compressed, appressed flatwise against the glumes; first glume wanting; second glume coriaceous, mucronate or awned, completely enfolding the thin lemma and palea, the palea sometimes obsolete. Low perennials, with creeping, short, pungently pointed blades, and terminal racemes, the spikelets on short appressed pedicels. Z. pungens Willd. Named for its spikelets much narrower than Z. japonica. Type species Z. japonica—Japan, Korea, Manchuria, China.