RUBBER AS A PROTECTIVE DEVICE ON CONCAVE
TEETH FOR THRESHING SEED BEANS

B. L. WADE AND W. J. ZAUMEYER

LOW germination of seed beans resulting from thresher injury to
the seeds has received attention by investigators for some time
Harter found that thresher injury to the seeds was the cause of
much of the "bald head" (an injury to the epicotyl) found in beans.
Later, Borthwick studied other types of injuries of baby lima beans
due to the same cause. In a rather extensive study on this subject,
Bainer and Borthwick found a direct relation between cylinder
speed of threshing machines and the percentage of seed damaged,
the greater speed causing the larger amount of damage.

It has been claimed by some threshermen, seedsmen, and others
that the use of rubber on the concave or cylinder teeth of threshing
machines would greatly reduce the amount of cracking in seed beans.
The investigations here reported were conducted to determine the
extent to which damage is reduced by this means.

The beans used in 1934 were a mixture of miscellaneous F_5 and F_6
hybrid lots of the Stringless Green Refugee type. In 1935 the beans
were from the F_5 generation of a hybrid of the Bountiful and Wells
Red Kidney types. They were grown at Greeley, Colo., and were per-
mitted to ripen completely on the plant in the field before threshing.
The vines were pulled from the field in the morning and threshed in
the afternoon of the same day. The vines and pods seemed drier this
way than if pulled in the usual manner, when some greenness remained
in the pods and then permitted to cure in small piles. It is known
that beans cut a little too green are difficult to thresh because the pods
dry tightly around the seeds, especially if the conditions for curing
are unfavorable.

The Refugee type of beans used in 1934 would be considered by
commercial threshermen as very difficult to thresh, while those used
in 1935 were comparatively easier. In drying, the pods of the String-
less Green Refugee type adhere very closely to the seeds. In thresh-
ing, the pods frequently break crosswise at each side of the bean
leaving it encased in a portion of the pod. The Bountiful types of
beans split open along the sutures very easily when struck by the
cylinder teeth, thus readily releasing the beans. For this reason
such types of beans are less difficult to thresh than those of the
Refugee type.

The thresher used was of a small Owen type consisting of two
cylinders each 12 inches in diameter. They were 12 inches in length

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1 Contribution from the Division of Fruit and Vegetable Crops and Diseases,
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2 Senior Geneticist and Associate Pathologist, respectively.
5 Bainer, Roy, and Borthwick, H. A. Thresher and other mechanical injury