

September 26, 1943.

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Dear Marcus,

I was delighted to learn that you were coming to Illinois, as I hope it may facilitate our seeing each other. Do pay us a visit as soon as you can, and we will likewise.

I'm writing you now to ask you something about "dotted". One of the students in our department has expressed some interest in following through a couple of my suggestions for studying the diffusibility of the dotted effect from Dt a² cells to dt a, but before encouraging it any further I thought it best to ask whether you've ever tried these proposals.

The first you have undoubtedly observed upon: Do aCR cobs pollinated with a² Dt bearing pollen show any mutations in the pericarp or other maternal tissues? There should be some opportunity, if the chance exists, for any "Dt substance" to diffuse from the endosperm, and possibly affect the mutability of a alleles.

The second would look to heterofertilization to provide endosperm and embryo of different constitution such that one carried dt a and the other Dt a² or Dt A. An a² C R (or similar) plant would be pollinated with a mixture of dt a and Dt A. I understand that heterofertilization occurs in maize with a frequency of about 1%, which would allow several kernels on each ear which might be dotted if diffusion of the Dt effect from embryo to endosperm were possible. Since the embryo later assimilates the endosperm, it would also be worthwhile to look for dotted effects in the seedlings, (especially if markers can be used, as I am told they can be, to identify heterofertilized seeds).

Such experiments would be a necessary preliminary to attempts at chemical extraction of the hypothetical Dotted substance, and if they failed to show its diffusibility, I should be very sanguine about the possibility of success, and conversely.

No, I'm not becoming acorn geneticist just yet, but Esther's work on the genetics of mutability in *E. coli* has greatly stimulated our interest in the general problem typified by Dotted. In coli, I've run into a stock which in crosses frequently gives heterozygotic "prototrophs", rather than the typical haploids. These heterozygotes continue to segregate for a great many factors, but may be haplogenic for others, suggesting aneuploidy. Haven't solved the problem yet, but hope to discuss it with you soon.

Best of luck, and regards,

Sincerely