A NOTE ON ONION COUCH.

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ONE of the commonest grasses found in hedges and thickets in this country, more especially on the lighter soils, is the Tall Oat Grass (*Arrhenatherum avenaceum*, Beauvais). In meadows it is generally present, abundantly on some soils, while occasionally it forms part of the "seeds" mixture put down for temporary or permanent pasture. In some localities a form of this grass known as "Onion Couch" becomes a dangerous weed on the arable land—this plant is identical in outward appearance with the Tall Oat Grass except at the base of the stems where the nodes swell and form chains of bulbs each of which is capable of breaking off and giving rise to a new plant. This habit of growth together with a liberal supply of seeds formed in June and July make it a very difficult weed to eradicate. Its occurrence is usually reported from the lighter soils, but in the West of England the heavy land is equally badly affected.

Botanists differ as to whether the bulbous form is entitled to specific rank. Bentham and Hooker do not recognise the onion form at all while Reichenbach distinguishes it as *Arrhenatherum nodosum* and Lindley *Arrhenatherum bulbosum*. The question is whether the bulb structure is a congenital variation of specific value or the outcome of physiological response to the conditions of the habitat, such as for example, arable land in distinction to meadow, shading, wet or dry soil, heavy or light land. To test this point the following experiments were arranged.

Seed of the onion couch was procured from Perse Condle, Dorset, where the plant abounds on a heavy soil derived from the Oolite, and some Tall Oat Grass seed was collected at Rothamsted. No difference could be detected between the two samples. Glazed earthenware pots

1 and 2. Rothamsted Soil. 25% water.
1. Seeds of Tall Oat Grass.
2. „ „ „ Onion form.

3 and 4. Rothamsted Soil. 30% water.
3. Seeds of Tall Oat Grass.
4. „ „ „ Onion form.

of about 14 cm. in diameter and 18 cm. high were prepared to afford the following comparisons.

1. *Control.* Rothamsted soil + 10 % coarse sand to improve the texture. Moisture content 25 %.
2. *Wet Soil.* Moisture content increased to 30 %.
3. *Dry Soil.* Moisture content decreased to 20 %.
4. *Shading.* Round the rim of the pots containing soil as in the control, cylinders of brown paper were placed, so as to rise eight inches above the surface.
5. *Evaporation Checked.* Round the rim of the pots glass cylinders (eight inches high) were placed.
6. *Thicker Seeding.*
7. *Sandy Soil.* A very light sandy soil used. Moisture content 15 %.
8. *Clay Soil.* A mixture of heavy clays used. Moisture content 25 %.

In each case four pots were prepared, two were sown with seed from the ordinary Oat Grass and two with seed of the bulbous form. The pots were watered once a week to keep the moisture constant. The seed was sown in September 1910, the plants germinated and were well up before the winter set in but no differences were noticeable. Bulbs began to appear in March 1911 and by May all the pots sown with seed from the onion couch were producing chains of bulbs while the Tall Oat Grass pots remained normal. This shows that the habit of forming bulbs is hereditary and does not depend on the conditions of the habitat. Other than the bulbs, no differences in habit were noted between the two plants.

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