

months as dormant mycelium in grass hosts and volunteer wheat. Similarly the fungus overwinters as hibernating mycelium inside the leaves of wheat or grasses. The importance of cool temperature to stripe rust development is emphasized by the fact that high temperatures may render susceptible plants resistant to infection. Thus susceptible wheat plants grown at 77°F were found completely resistant to stripe rust, whereas the same plants grown at 55°F were completely susceptible.

Stripe rust is capable of forming a new crop of spores every 12 to 13 days under favorable conditions. The rust sporulates on leaf blades, on leaf sheaths, inside the glumes, and even on wheat kernels themselves. When the seed is infested, germination may be reduced by 50 per cent; however, the disease is not transmitted

from one crop to the next by infested seed wheat. Stripe rust is thus neither seed-borne or soil-borne, but large clouds of spore inoculum are wind-borne.

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GAIN AND FEED CONSUMPTION OF PIGS* FED BLACK-EYED PEAS

| Ration number and description | Black-eyed peas | | | |
|---------------------------------|-----------------|-------|-------|-------|
| | 1 Control | 2 20% | 3 20% | 4 50% |
| Initial weight, lb. | 79.0 | 81.3 | 79.7 | 80.0 |
| Av. total gain, lb.** | 110.3 | 91.0 | 87.0 | 68.3 |
| Av. daily gain, lb. per pig | 1.58 | 1.30 | 1.24 | 0.98 |
| Av. daily feed consumption, lb. | 5.76 | 4.58 | 4.53 | 4.09 |
| Feed per lb. of gain, lb. | 3.65 | 3.52 | 3.65 | 4.17 |

* Six pigs per lot for 70 days.

** Analysis of variance yielded a mean square of 1780.22 which is statistically highly significant ($P < 0.01$). The Duncan (1955) multiple range test showed that gains of pigs on both rations 1 and 4 differed from all other lots at the 1% level. The difference in gains between pigs on rations 2 and 3 lacked statistical significance.

Results

Results of the 70-day feeding trial indicate that the substitution of black-eyed peas for barley, or for barley and the oil meals, causes a reduction in weight gain. Less feed was apparently consumed when black-eyed peas were included in the ration. Statistical analysis of feed data could not be carried out as the animals were group-fed. Feed utilization appeared lowest on the ration containing 50 per cent black-eyed peas.

Rations containing black-eyed peas did not appear as palatable as the control ration, and much more feed was wasted. The 50 per cent black-eyed pea group (ration 4) had the greatest wastage. During the 28-day period on a ration of straight black-eyed peas, the group of four hogs gained 0.59 lb. per pig per day and consumed only 3.43 pounds of black-eyed peas (or ration) per pig per day. Feed consumption was very low initially, but increased to almost 5 pounds daily at the conclusion of the 28 days.

Examination at slaughter and histological studies of kidneys showed no apparent differences between hogs fed the different rations.

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BLACK-EYED PEAS as a swine feed

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Feeding trials with rations including ground black-eyed cowpeas for swine resulted in reduced consumption and utilization of feed as well as lower gains—but there was no evidence of toxicity. Twenty-four growing hogs with an initial weight of about 80 pounds were fed a control ration and rations containing 20 per cent and 50 per cent ground black-eyed cowpeas (*Vigna sinensis*) for an experimental period of 70 days. As the percentage of black-eyed peas increased, gain in weight decreased. The pigs on the ration containing 50 per cent black-eyed peas gained about 38 per cent less weight than the controls.

Composition of the cleaned, cull, black-eyed peas used in the experiment included: dry matter, 91.5 per cent; crude protein, 23.2 per cent; nitrogen-free extract, 60.9 per cent; ether extract, 1.0 per cent; crude fiber, 2.6 per cent; and ash, 3.8 per cent. The peas were ground and added to three of the four rations shown in the table. The second ration differed from the first (control) by the substitution of 20 per cent black-eyed peas for an equal amount of barley. This substitution caused an increase in the

crude protein content of the ration. In the third ration, black-eyed peas were substituted for barley and all of the cottonseed and soybean meals, giving the ration a crude protein content about equal to that of the control ration.

PERCENTAGE COMPOSITION OF RATIONS
FED TO PIGS*

| Ration number | 1 | 2 | 3 | 4 |
|---------------------------------------|------|------|------|------|
| Ground barley | 80.5 | 60.5 | 68.5 | 38.5 |
| Ground black-eyed cowpeas | | 20 | 20 | 50 |
| Dehydrated alfalfa meal | 5 | 5 | 5 | 5 |
| Soybean oil meal | 4 | 4 | | |
| Cottonseed meal | 4 | 4 | | |
| Meat and bone scraps (45% protein) | 6 | 6 | 6 | 6 |
| Salt | 0.5 | 0.5 | 0.5 | 0.5 |

* Plus 0.45 lb. zinc sulphate per ton.

The 24 purebred Duroc barrows used in the trial were weighed in at about 80 pounds each and sorted into four lots with rations assigned at random. They were fed in concrete pens with self-feeders for an experimental period of 70 days. At the conclusion of this feeding period, two hogs were picked at random from each lot for slaughter. The four remaining hogs being fed ration No. 4 (50 per cent black-eyed peas) were switched to a ration of black-eyed peas only, for an additional 28 days and then slaughtered.