

second generation. Type wild awns often appear, also the hairy glumes of the wild parent. In this series of hybrids the appearance of large grained types is one of the most interesting phenomena. Some fixed types are now being grown in our selections that have much larger grains than either parent.

#### NAKED OAT HYBRIDS.

In the series of naked oats crossed with different hull types, a peculiar correlation was found, which has already been mentioned before this Society by Dr. H. J. Webber. The spikelet of the naked varieties usually has more than three grains while in the hulled types three grains is the limit. The first generation plants produced a head naked at the top and hulled at the bottom. In the second generation, one-fourth of the progeny were typical naked plants, one-fourth were hulled, and one-half like the first generation hybrids. The naked plants all had long spikelets with more than three grains while the hulled plants had spikelets with the usual two or three grains. In future generations no exception to this rule has been found except that one second generation plant of a cross between European Hulless and Garton's Tartar King which seems to have become fixed in the intermediate hybrid type. In this example we have an extremely rare case of the fixation of a heterozygote or hybrid type.

One of the objects of crossing naked with hulled types was to secure a large grained naked oat of high yielding power. Most of this series was discarded early, as they gave no promise. However, a cross between European Hulless and Sixty Day gave among many others one plant which had large grains and in the yield test of last year produced nearly double that of its hulless parent. The grain averages fifty per cent larger than either parent and is equal in size and weight to the hulled grain of our best Illinois varieties. This is a very good example of the possibility of securing a form with a character not found in either parent. It is all the more remarkable since crosses with none of the large grained types gave the desired size.

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#### REPORT OF THE COMMITTEE ON SWINE BREEDING.

By D. A. GAUMNITZ, *Chairman, St. Anthony Park, Minn.*

Breeding swine should mean more than the mere reproduction of species. It should mean the mating and particularly the selection of animals so as to produce individuals which, as breeding animals, would be (1) prolific; (2) regular as breeders; (3) superior as parents, and which as meat producers would be (1) disease resistant, (2) economical converters of plant into animal products; and (3) heavy yielders of dressed carcasses which show profuse muscling and quality of flesh without too small bone.

## QUALITIES THAT THE SWINE GROWERS DEMAND IN SWINE.

The swine growers are in search of, and breeders are willing to pay big prices for, swine that will give high-class results. Such results can be secured only by obtaining prepotent animals, possessed of the desirable inherited and transmitting qualities, by providing proper management and conditions for them, and by carefully breeding them. The qualities desired by swine growers and the value placed upon them are wellnigh indeterminable, but it is safe to say that almost universal preference is made in favor of (1) sows that come in season regularly, that rarely if ever do not conceive at first service, and that as a rule, have no trouble at farrowing time, when in proper condition; (2) sows that will raise at least eight pigs at a litter and not give birth to more than twelve on an average; (3) sows that retain the sense of hearing and sight until at least seven years old; that are good mothers, quiet in disposition, excellent milkers, and easy and economical keepers; (4) pigs that resist many diseases of such a nature as inherited weaknesses, common ailments, and infectious diseases that are in some cases proved resistable; (5) pigs that are economical in growth because of a conformation that permits of gains; because of their fitness for pasturing and because of inherited tendencies to produce pounds of gain with minimum feed; (6) pigs that yield heavy percentage in dressing, and that show "quality" in the muscle without an excess of fat or too little bone. Both these features differ somewhat in different localities. A standard of yields when pigs are at a fair degree of fatness might be:

120 lb. pig, 72 per cent.	300 lb. pig, 81 per cent.
150 lb. pig, 74 per cent.	350 lb. pig, 83 per cent.
200 lb. pig, 76 per cent.	400 lb. pig, 85 per cent.
250 lb. pig, 78 per cent.	

## RECORDS.

Records that will insure selection of animals that will possess certain desirable qualities are necessary. The animal of greatest value is the "occasional" one found among great numbers. To find this one, and those swine of more than ordinary value; and to separate them from the great numbers so that they may be bred among themselves without the admixture of blood from other pigs, necessitates the applying of some "value" measure, after the *best unified conditions of feeding and management* have been provided for the swine. What a few of the "value" measures should be, has already been suggested. What the essential features to be borne in mind in connection with feeding and management are, it is hard to say since local conditions vary so widely and since this science is as yet only imperfectly developed by experiment stations; but some points to be considered are:

1. Methods of feeding.
2. Pastures.
3. Kinds of feeds.
4. Preparation of feeds.

5. Shelter.
6. Breeding.
  - .01 Manner and system of mating.
  - .02 Ages to breed.
  - .03 Time of breeding.
  - .04 Miscellaneous.
7. Miscellaneous.

These conditions once settled, the same treatment and chance for growth would prevail.

#### FOUNDATION STOCK.

In securing the foundation stock a great step might be taken in the right direction by purchasing the stock of hogs that come nearest possessing the "combined values" desired, regardless of show-yard records, if the values assigned are true.

The stock secured, the unified conditions of feeding and management applied, then records must be taken that will be the guide in sorting the desirable from the undesirable animals.

Some breeding-swine records that would be valuable would show:

1. Feeds required per year per hundredweight (for keep).
2. Regularity in conceiving.
3. Prolificacy.
4. Sows as milkers.
5. Sows as to kindness and motherliness.
6. Prepotency.
7. Stamina of litters as regards common ailments.
8. Loss in litters.
9. Size of litters.
10. What pigs amount to at slaughter test (this would probably not be necessary the first year or two).
11. Miscellaneous.

Some litter records that would be helpful in getting an estimate of "value" measures of the litters, are:

1. Average amount of feed required per pig in litter, after weaning, for a given period to make a given weight.
2. Size of litter.
3. Development in general.
4. Development of bone, hair, muscle, and fat, as determined by the slaughter of one or two representatives at a given period from each litter.
5. Disposition as regards intelligence, nervousness.
6. Characteristics in detail.
7. Miscellaneous.

#### WHO SHOULD TAKE UP BREEDING.

The records necessary to do breeding on a statistical basis are difficult to collect and tabulate. Individual breeders have unconsciously by observation and memory kept these performance records in mind, and a very few of these during their lifetime have succeeded in finding that animal that is peerless among others. Not a few by this same process have been able to build up herds of more than ordinary merit. Had per-

formance records, in both cases, been kept up so that the work might have been continued, and had all the extraordinary animals and this animal that surpasses others been bred together and the poor blood from the low or less than mediocre grade of animals been prevented from creeping in, and the poor animals from the good ones promptly weeded out, no one could say what improvements might reasonably have been expected.

This work may therefore be taken up by a single breeder or on a government farm, but in order to secure great numbers of animals with which to work annually in the hopes of securing this "occasional" valuable animal, and those of more than average in value, in a short time, cooperation among farmers with the state experiment station and the government is strongly advised as the proper and logical course. Not only are these long time projects, if put under government and state supervision with men in charge growing into the work and getting familiar with the records from time to time, going to be immortal, if necessary, but the work will be aided by a better natural scheme for distribution of the good animals produced because their blood will be found in this centralized breeding community. Those men gifted in breeding will have a greater opportunity to do work and to see results secured than in any other plan yet suggested, and there will be extended to the people better systems of keeping breeding records, which in future must mean considerable to breeders. Then, too, where the government aids in disposing of the cost of producing these superior animals, every citizen will help to pay his share in proportion as he is taxed and the government helps. The cooperator will pay in this production by the work he does, the money he invests and the risk he takes. The people in general will be remunerated by getting animal products cheaper because of the better animals produced, and the cooperators, by producing more animals and of greater value than if this extra labor, investment and risk had not been assumed.

#### THE PLAN.

In carrying out such a plan a cooperative association with about twenty members should be organized in connection with the state experiment station and the Department of Agriculture at Washington. These members should preferably be young men who own and live on their farms and who show a desire or instinct for this sort of work.

The management of this organization should be vested in an executive council of three, composed of one member from the association, one from the experiment station, and one member from the Department of Agriculture, which should supervise, either directly or indirectly as they may deem wise, purchases, breeding, general management, sales and uses of all animals.

The project being a long time one and considerable of the government funds becoming invested, a bond of \$200.00 executed in favor of the association should be required of each member and two years'

warning should be required of each member by the council before he can withdraw unless such requirement were waived by the council.

Each member with such public aid as he may be granted should procure a boar, and at least 10 sows, as many as possible possessing performance records such as are desired by the council.

The station and the Department of Agriculture are to assist as far as is feasible in finding, purchasing, and transporting animals at the beginning and during the existence of this association.

The station and the Department of Agriculture, through the council or the council's agent, should collect and tabulate on the per cent basis where possible, all records of whatever nature they may be, every month.

With the aid of such records the council, assisted by their agent, and cooperators, should decide upon a complete scheme for selecting the animals that should be retained and mated, and those that should be sold outside the association.

All the progeny raised by members and retained within the association should be the property of the respective members, subject to such rules of use, distribution, and sale within the association as may be agreed upon by the council and members.

(Signed)

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