# CHAPTER IX

## PESTS AND DISEASES

Like the case anywhere with agricultural crop, pests and diseases pose a serious problem in the Block under study. In enumerating the factors affecting the productivity of the Block in the previous Chapter, mention was made that one factor which may be of considerable importance is pests and diseases. This Chapter is devoted to the examination of the prevalence and extent of pests and diseases.

From the information gathered in the interview, it appears that three major types of pest are prevalent in the Block, viz. worm, rat and locust. A farm may be infected with anyone of these; but it is not rare that a farm is subject to any two of these simultaneously, and in a few cases even to all the three. Of the diseases, a kind of disease which attacks the leaves of the plant is reported.

According to the interviewees, there are two kinds of worm. One attacks the roots of the padi plant. This hampers the growth of the plant and it becomes stunted. Further, it also prevents it from multiplying. This results in each clump of padi constituting fewer single plants than it otherwise would, and in the stalk of each plant becoming shorter with fewer grains. The ultimate consequence is that the total output of the plant is reduced.

Another kind of worm, according to them, attacks the leaves of the plant. If the attack is to extreme, the plant will become "hangus", that is it withers away. Otherwise, the growth of the plant is stunted and its multiplication hampered, with the ultimate result similar to the above.

Lesser in extent, but still a ruinous pest, is rat. This pest appears particularly when padi is about to ripe, and when it is ripening as well. It causes destruction to the plant by feasting on the padi grains, and sometimes by tearing the plant open in order to reach at its tender leaves.

Locust, though reported in a very few instances, is also prevalent in the Block. It appears that this pest attacks the tender leaves of the padi plant, particularly after the plant has undergone the process of "bunting", that is its multiplication stage.

Notably absent as a pest in this Block is bird. No interviewee mentioned it. It is not certain whether it is actually absent, all that all the interviewees accidentally forgot about it. In any case, its absence may perhaps be accounted for by the fact

that S.S. is a vast padi area with padi plant ripening at almost the same time that the nuisance caused by bird is not particularly felt singly.

The solitary disease prevalent in the Block attacks the leaves of the plant. Whenever a plant is attacked by this disease, the leaves turn firstly yellow and later on red. The growth of the plant is perturbed and its multiplication hampered.

These are precisely the kinds of pest and disease reported to be existing in the Block. We may now proceed to examine the extent of the presence of each of these, looked at from various angles.

Pests and Diseases by Farms

We approach first from the point of view of farms. Table 9.1 shows the distribution of farms by various pests and the disease or their combination. It can be seen at the outset that out of the total 137 padi farms in the Block, only 14 are unaffected by pests and diseases. This represents just 10.2%. Assuming that the seven farms for which no information is available are also affected, then 89.8% of the total number of farms in the Block are affected by pests and the disease. This is indeed a very great magnitude. The problem of pests and diseases of the Block from the point of view of farms is thus very serious.

TABLE 9.1

DISTRIBUTION OF FARMS BY PESTS AND DISEASES

| Pests and Diseases | Farms | Percentage |
|---|---|---|
| No Pest and Disease | 14 | 10.2 |
| Worm | 97 | 70.8 |
| Rat | 1 | 0.7 |
| Worm and Rat | 15 | 10.9 |
| Worm, Rat and Grassbopper | 1 | 0.7 |
| Leaf Disease | 2 | 1.5 |
| No Information | 7 | 5.1 |
| Total | 137 | 99.9 |

The Table further shows that worm is present as a single pest in 97 farms, or 70.8% of the total number. Rat is the sole pest in only one farm. Worm and rat combined affect 15 farms which make up 10.9% of the total, while a triple combination of worm, rat and locust is present in one farm. Worm is thus the most prevalent pest in the Block, being present singly or in combination with others in 114 farms, or 83.2% of the total. Next comes rat, being prevalent in 17 farms. Locust uniquely affects only one. Two farms are affected by the leaf disease.

Pests and Diseases by Variety of Padi

We shift to examine the prevalence of pests and diseases in the Block from the standpoint of variety of padi. Table 9.2 shows the total respective number of lots cultivated with various varieties of padi, and the number of these that are unaffected as well as affected by different pests and the disease.

It can firstly be seen that out of 35 lots cultivated with Radin, only six lots are unaffected. The extent of pest and disease presence is thus about 82.9%. Of those affected lots, 25 are affected solely by worm, three by worm in combination with others and one by leaf disease.

TABLE 9.2

DISTRIBUTION OF LOTS AFFECTED/UNAFFECTED WITH PESTS AND DISEASES BY VARIETIES OF PADI

| Padi Variety | Total Lots Cultivated | Lots Unaffected | Lot Affected With Worm | Lots Affected With Rat | Lots Affected With Worm, Rat, Etc. | Lots Affected With Leaf Disease |
|---|---|---|---|---|---|---|
| Radin | 35 | 6 | 25 | - | 3 | 1 |
| Seruyong | 6 | 1 | 5 | - | - | - |
| Seri Raja | 12 | 1 | 10 | - | 1 | - |
| Mengkudu | 3 | - | 3 | - | - | - |
| Mixed | 33 | 1 | 26 | 1 | 4 | 1 |
| Total | 89 | 9 | 69 | 1 | 8 | 2 |
| No Information | 15 | | | | | |

Of the six lots cultivated with Seruyong, five lots are subject to worm. The remaining one is unaffected. The extent of the presence of pest is thus 83.8%.

Seri Raja is cultivated in 12 lots. Of these only one is unaffected. Ten are subject to worm, and one to worm and others. 91.7% are thus pest infested.

Hundred per cent pest attack is shown by the variety of Mengkudu, in which case all the three lots cultivated with it are affected with worm.

The mixed category of varieties also shows a very high degree of pest subjection. Only one out of 33 lots is not affected. The extent of pest prevalence is thus 96.1%. Of the affected lots, 26 are subject to worm, one to rat, four to worm and others and one to leaf disease.

The extent of the presence of pests and diseases varies thus between varieties of padi, ranging from 82.9% in the case of Radin to 100% in the case of Mengkudu. Is it justifiable for us to conclude that of these varieties, Mengkudu is the most exposed variety to pest and disease and Radin the most immuned? I think we are not. The prevalence of pests and diseases is not solely the function of padi variety. It depends also, for example, on the degree of pest control exercised and the application of fertilisers.

Pests and Diseases by Location

Map VII depicts the prevalence of pests and diseases in the Block by location. The unit of consideration here is lot.

It appears that out of 98 lots with regard to which information is available, only 11 lots are not affected with any kind of pests or diseases. The extent of pest prevalence from the point of view of lots is thus 88.8%

It appears further from the Map that there is no distinct pattern as regard pest and disease prevalence. The unaffected lots, for example, appear scattered and show no trend of concentration. Looking at the Map lengthwise, at least two unaffected lots appear in every Row.

However, if we were to divide the Map crosswise into two approximately equal halves, then more of the unaffected lots appear in the lower half than the upper one.

From the above examination, we are thus able to see the magnitude of pest and disease prevalence in the Block. It is about 89.8% from the point of view of farms and 88.8% from the standpoint of the total analysable lots. This extent is certainly by any measure a very serious one.

The significance of this that, as we have seen, pests and diseases play a role in the determination of the productivity of the Block. The seriousness of pest and disease prevalence in the Block produces a serious impact on its productivity. Even the interviewees themselves realise this. When asked to explain why the productivity of their respective farm is less or more than that of the last season, twenty interviewees attribute the increase in their padi output to the absence or less prevalence of pests and diseases this season, while thirty-one interviewees blame the prevalence or the more prevalence of pests and diseases this year for the decrease in their output. Further, the average productivity per acre for 10 out of 11 unaffected lots shown in Map VII (no productivity figure is available for lot 2872) is 265 gantangs, 15 gantangs more than that of the Block as a whole.

The prevalence of pests and diseases is thus a very serious agricultural problem in the Block. Measures of pest and disease control are thus very urgently needed. It is not known to what extent are these measure presently exercised in the Block. What is certain is that the application of fertilisers, which may reduce the extent of leaf disease and worm infection, is carried out only to a very little extent in the Block. We shall say more of this in the final Chapter.

CHAPTER X

## VIEWS REGARDING WATER SUPPLY

In a wet padi area like that of the S.S., water supply is of paramount importance. In fact, the availability of sufficient and timely provision of water is among the first and primary requisites of such an area. Judging from its site and set-up, there is no slightest doubt as to this having occupied the mind of the early planners of the S.S.

The condition of water supply bears a far-reaching effect on the padi plant and its productivity. It contributes to these just as much as do the other factors so far enumerated, if not more. We shall here particularly examine the views expressed by the interviewees regarding the situation of water supply in the Block.

Block P, like other Blocks of the S.S., depends for its water supply on irrigation rather than on rain. In fact, as can be seen from Map I, the whole S.S. itself is a network of irrigation canals. It is these main canals, systematically constructed as they are, that actually form the boundaries separating one Block from another.

Block P is thus flanked on all its four sides by these canals. On the bank of each of the two canals running lengthwise is a large mud track. Running alongside this track in the Block is a drain. In addition, the Block is also divided equall lengthwise by a foot-path on both sides of which is a drain. From the two main canals flanking the Block lengthwise, water is let into or out of the drains alongside the mud track through water-locks, two of which are placed at each of the extreme ends of the Block, and one at about the middle. The two drains bordering each side of the foot-path along the middle of the Block derive their water from, or empty it into, the main canal running crosswise at the lower end of the Block. The corresponding main canal at the upper end of the Block serves not this Block, but the next. From these four drains running lengthwise, yet smaller drains appear at intervals running crosswise of the Block directly into the respective rows of padi fields. The irrigation and drainage of the Block is thus served by the four drains, one serving a row.

The S.S. derives its main source of water supply from the vast swamp situated to the north-east of it. There is a large bund separating the swamp from the S.S. The water from the swamp is let into the S.S. by the distributary canals through the three water-gates situated at the head of each of three of these canals. It is

drained particularly by the drain canals through the two water-gates situated at the south-western tip of the area.

In this way, the irrigation and drainage of the area is completely under control. The farmers in the S.S. are strictly notified when the area would be irrigated and when it would be drained. In other words, they are specifically informed as to when to start work and when to carry out such important process as transplanting.

Views Regarding Water Supply by Farms

There are two important considerations with regard to water supply of any wet padi area: time and level. Time is crucial, for padi is so periodising a crop. Water must be available, for example, at the time when work is to begin and when padi is to be transplanted. Level is equally crucial, for padi plant needs different levels of water at different processes of its growth. Water level is determined by its amount available.

In the irrigated Block I, these phenomena are man - controlled. As has been pointed out, the farmers are instructed when the fields would be irrigated and when drained. Further, they are specifically advised as to when to start work and to transplant.

Yet not all the farmers in the Block expressed the same views with regard to these phenomena of water supply. We shall proceed to examine these views firstly in connection with time, then with amount, and finally with the two combined.

Table 10.1 shows the distribution of farms by three different views with regard to the time of water supply. It can be seen that for 128 farms, or 93.4% of the total, the supply of water is at its right time. Four farmers making up 2.9%, however, expressed that it is too early while another five or 3.6% said it is too late.

There is thus a 6.5% divergence of views from what is commonly held. As instructions are given as to when to begin work and when to transplant, it is hardly conceivable why this divergence of views should arise at all, unless there are external factors working to the disadvantage of these farms alone. An examination of the location of these farms in May VII, however, reveals that they are reasonably scattered; and not concentrated at a place with any disadvantage. Those farms reporting early supply are in lots 2807, 2835, 2868 and 2891; while those reporting lateness are found in lots 2791, 2812, 2832, 2882 and 2886. There is thus no possibility of such factors as extraordinary leakage affecting these farms only causing water to arrive early, or similar blockade causing it to arrive lat. Neither is there the possibility of a farmer blockading the water from another in those lots with two farms, such as lot 2812. For, in all instances of two-farm lots in the Block, the lots are divided lengthwise and not crosswise, with the result that each farm is accessable to the drain. Further, these farmers appear isolated

TABLE 10.1

DISTRIBUTION OF FARMS BY VIEW REGARDING WATER SUPPLY: TIME

| Time | Farms | Percentage |
|---|---|---|
| Right Time | 128 | 93.4 |
| Too Early | 4 | 2.9 |
| Too Late | 5 | 3.6 |
| Total | 137 | 99.9 |

in their views, for no such complaints are voiced by those interviewees surrounding them.

I personally cannot thus help but incline to believe that the real causes of these extraordinary views are not inherent in the system of water supply in the Block, but in the respective farmers themselves. Perhaps, they might have expressed inaccurate views. A most probable explanation, however, is the possibility that those five farmers complaining that water was too late might have started work earlier than instructed, and those four complaining that water was too early might have started work earlier than instructed. An examination of Map V reveals that those farmers operating lots 2886, 2890, 2807, 2835 and 2891 do not stay permenantly on their lots. Perhaps this may partly explain the divergence of their views. Staying away, they might have come to work too early in anticipation of further delay caused by the distance, or too late because of the difficulty imposed by the distance.

Table 10.2 shows the distribution of farms by views regarding the amount of water supply. It depicts that the interviewees of 129 farms constituting 94.2% of the total, expressed that the supply is of the right amount. Six interviewees, however, expressed excessiveness, while another two reported insufficiency.

There is thus a 5.9% divergence of views. It is noteworthy that of the two farmers expressing insufficiency one, operating sub-lot 2812, is the very farmer who already expressed lateness. Insufficiency in his case may thus be the logical outcome of his lateness to work. The other, operating lot 2824, has no complaint with regard to time. His immediate neighbours, however, made no such complaint as his regarding insufficiency of water. A feasible explanation is that his field may be slightly raised from others causing the level of water to be sufficiently low.

TABLE 10.2

DISTRIBUTION OF FARMS BY VIEW REGARDING WATER SUPPLY: AMOUNT

| Amount | Farms | Percentage |
|---|---|---|
| Right Amount | 129 | 94.2 |
| Too Much | 6 | 4.4 |
| Not Enough | 2 | 1.5 |
| Total | 137 | 100.1 |

There appears to be a considerable weight in the view expressing excessiveness of water. Six interviewees share in this view. It is the highest number of any divergent view yet examined here. It would be more appropriate, however, to discuss this view when we examine the phenomenon of water supply by location.

Table 10.3 demonstrates the distribution of farms by different views regarding the time and amount of water supply combined. It can be seen that out of 128 farms expressing right time in Table 10.1, 122 express right amount as well. The remaining five express excessiveness, while another one express insufficiency. Out of four expressing too early with regard to time three, however, find the water just at its right amount, while one finds it too much. Out of five too late cases, four have no complaint with regard to the amount and only one complains of insufficiency.

From the foregoing discussion, it becomes obvious that the interviewees of 122 farms, or 89.1% of the total number of farms as shown in Table 10.3, have no complaint whatsoever with regard to water supply of the Block. Of the remaining 15, 13 have complaints only either with regard to its amount or its time. Only two complain both with regard to the time and amount. Further, as has been pointed out, some of those who complain might have the real causes of their complaint inherent not in the system of water supply, but in factors external to it. We can thus arrive at a conclusion that the water supply of the Block, from the views expressed by the interviewees, is reasonably good.

A word need further be said on this. A has been pointed out, padi plant actually necessitates several timings and several levels of a water according to the processes of its growth. Immediate irrigation and reasonably high level of water is necessary at the time when the fields are prepared. After transplanting, only a

TABLE 10.3

DISTRIBUTION OF FARMS BY VIEWS REGARDING WATER SUPPLY: TIME/AMOUNT

| Views | Farms | Percentage |
|---|---|---|
| Right Time/Right Amount | 122 | 89.1 |
| Right Time/Too Much | 5 | 3.6 |
| Right Time/Not Enough | 1 | 0.7 |
| Too Early/Right Amount | 3 | 2.2 |
| Too Early/Too Much | 1 | 0.7 |
| Too Late/Right Amount | 4 | 2.9 |
| Too Late/Not Enough | 1 | 0.7 |
| Total | 137 | 99.9 |

level of about five to eight inches is required. When the plant has multiplied and begun to show grains, drainage is necessary to leave the water at a level of about three to four inches only. Complete drainage is necessitate when the padi is about to ripe and at the time of harvesting. Different timings of irrigation and drainage, and different levels of water are thus required for different stages of padi cultivation. In any area, it is conceivable that the supply of water may be of the right level at the time of transplanting, but excessive when the padi plant is ripening. It is unfortunate that our Questionnaire, however, does not provide information with regard to the time and amount of water in relation to each of the above-mentioned stages. At the most, it is only a generalisation of the whole situation. It follows thus that the conclusion we have derived is only a generalised one!

Views Regarding Water Supply by Location

With the help of Map VIII, we shall proceed now to examine the condition of water supply in the Block by the location of lots or sub-lots.

The Map shows that there is a reasonably distinct trend of concentration in respect of these farms whose interviewees voice complaint of one kind or another with regard to water supply. Starting from the left, there is no such farm in Row I. Row II shows two

such farms, Row III shows six, and Row IV shows eight. There is thus an increasing tendency of complaints as we approach right. But, unfortunately, these complaints are not uniform. Further, as we have seen, some of them may not be genuine. We are thus hampered from deriving any definite and inclusive conclusion with regard to the whole Block. The complaints are too individual and even too personal.

However, we may say something with regard to those who complain of excessiveness of water. There are six of them, and are reasonably concentrated at the bottom right-hand corner of the Block, being lots 2852, 2863, 2868, 2879, 2884 and 2892. All of them share the same view. One possibility is that their fields may be deeper than those of the others. However, another possibility is that the Block as a whole may be generally titled towards this side, with the result that it is considerably deeper here, and with the depth particularly felt by those farms which are already slightly ddper than others, hence the farmers' complaint of excessiveness of water.

Another interesting phenomenon observable from the map is that in lots 2791, 2812, 2835, 2882, 2886 and 2891 only interviewees with regard to one farm out of two or three farms in each of these lots voice complaints. It is inconceivable how the supply of water can be a source of complaint to one farmer and not to another, both of whom operate the same lot. This is especially so when we recall that there is a very remot possibility of their blockading one another. This phenomenon reinforces thus the view formerly put forward that the causes of these farmers' complaint are inherent not in the system of the Block's water supply but in some other factors external to it.

We have thus looked into the situation of water supply in the Block. That water supply contributes a great deal to the productivity of the Block is indisputable. The soundness of the system of water supply in this Block we have just seen may partly account for the fact we have seen in Chapter VII that the productivity of the Block as a whole this year appears to be on its upward trend compared with last year. Like that of pests and diseases, the condition of water supply is also often quoted by the interviewees as an explanation as to why their padi output has increased or decreased this year compared with last year. Suffice us with the example of Seri bin Haji Sulaiman, the operator of lot 2832, who sought the explanation of a 17% decrease in his padi output this year in that the provision of water was too late.