# RESPONSE PATTERNS IN SOME AUSTRALIAN FARM ECONOMIC MAIL SURVEYS*

JOHN L. DILLON AND F. G. JARRETT

*University of Adelaide*

Despite their relative cheapness, mail surveys appear to have been used sparingly in Australian agricultural economics research. Doubtless the reasons for this unpopularity have been uncertainty about (a) likely response rates and (b) the extent of response bias. Aimed at dispelling some of this uncertainty, this note collates the response patterns achieved in five fairly recent mail surveys. Apart from these five, no other mail surveys seem to have been publicly reported.[1] The background to the five surveys is sketched below.

Cooke-Yarborough[2] in 1962 contacted the complete population of 576 commercial beekeepers in N.S.W. in a survey of honey production and marketing methods. The survey frame consisted of the State registration list of commercial beekeepers, *i.e.* apiarists who have more than 100 hives. Participants in this initial survey were also asked if they were willing to disclose their financial records. The 134 who were so willing constituted the sample for a further mail survey, this time of commercial beekeepers' costs and returns.

Gruen[3] in 1956 investigated the costs and returns of pasture improvement on wheat-sheep farms in southern N.S.W. As a convenient (albeit non-random) sample, Gruen used those 175 N.S.W. Department of Agriculture crop-forecast correspondents residing in the region. As the data later shows, it is not surprising that this tried-and-true sample yielded the best overall response rate of the surveys reported here.

Gruen and Pearse[4] in 1957 surveyed aerial pasture improvement in N.S.W. As a sample, they used a list of 406 farmers and graziers who were thought by District Agronomists and fertilizer agents to have used aerial techniques.

Lastly, in 1963 Jarrett and Dillon conducted a membership survey of

[1] No account is taken of a number of single-question mail ballots that have been conducted. Of these, a typical example is outlined in "Yes Vote for Homebush Scales", *Country Life* (Sydney), Dec. 27, 1963. In this ballot, sent to 3,795 accredited livestock producers, only 38 per cent of the ballots were returned. Nor is account taken of the activities of the Western Australian Office of the Bureau of Census and Statistics. This Office collects all its rural data by mail and, through legal threats, achieves a virtually 100 per cent response rate. No analysis of the time pattern of response is available for these W.A. Census Bureau surveys.

[2] Cooke-Yarborough, R. E. The honey industry in New South Wales. *Rev. Mktng. Agric. Econ.* 31: 5-39, 1963.

[3] Gruen, F. H. Financial aspects of pasture improvement on southern wheat-sheep farms. *Rev. Mktng. Agric. Econ.* 24: 196-221, 1956.

[4] Gruen, F. H. and Pearse, R. A. Aerial pasture improvement in New South Wales. *Rev. Mktng. Agric. Econ.* 26: 98-146, 1958.

the Australian Primary Producers Union (which encompasses all States except Western Australia). Aim of the survey was to delineate the type of farming characteristics of the A.P.P.U.'s 45,000 members. A random sample of 3,077 members, stratified by States and, in Victoria, by Branches was drawn from the 1963 membership list. At intervals of about 10 days after the initial mailing, two reminder notices (including questionnaires) were sent to those sample members who had not yet responded.

## Rate of Response

Sample size, rate of response, questionnaire size and the use of follow-up mail reminders for each of the five surveys is shown in Table 1. Comparing these data, it is noteworthy that the beekeeping-methods survey, with its relatively larger questionnaire and no follow-up reminders, yielded by far the lowest rate of response. Putting aside the Gruen and second Cooke-Yarborough surveys, both of which used proven respondents, it is also noteworthy that the Jarrett-Dillon survey with its use of two reminders yielded the best response rate.

TABLE 1

*Characteristics of Some Australian Farm Economic
Mail Surveys*[a]

| Aspect of survey | Survey conducted by: | | | | |
| --- | --- | --- | --- | --- | --- |
| | Cooke-Yarborough | | Gruen | Gruen and Pearse | Jarrett and Dillon |
| Orientation | Beekeeping methods | Beekeepers' costs and returns | Economics of pasture improvement | Aerial pasture improvement | Type of farming |
| Sample size (no.) | 576 | 134 | 175 | 406 | 3077 |
| Response rate (%)[b] | 39 | 66 | 73 | 57 | 66 |
| Questionnaire size (pp.) | 5 | 2 | 2 | 2 | 2 |
| Reminder notices (no.) | 0 | 1 | 1 | 0 | 2 |

[a] All five surveys used reply-paid envelopes.
[b] Including incomplete and dead letter office returns.

*Sources*: Cooke-Yarborough, *op. cit.;* Gruen, *op. cit.,* Gruen and Pearse, *op. cit.;* and personal communications.

## Time Pattern of Response

Table 2 presents information on the pattern of response over time by States for the Jarrett-Dillon survey. Comparable information is not available for the other surveys. Perusal of the table indicates a worthwhile response, overall, to the two reminder notices. Still, because a respondent returned the particular questionnaire sent to him with a particular reminder, this is not to say that he would not otherwise have returned the original questionnaire. Maybe he would have returned the

initial questionnaire anyway, give or take a couple of weeks! Conversely, some original questionnaires otherwise discarded may have been returned in response to a reminder notice. None the less, judging from the *graffiti* on the returned questionnaires, it is certain that the reminder notices cut down the time lag in response and enhanced the response rate.

Chi-square analysis of the raw data for the original and reminder responses of Table 2 indicates highly significant differences between the time pattern of responses by States, the atypical States being N.S.W. and Queensland. It is not known whether these different time patterns reflect attributes of the survey population itself or of the States' overall farmer populations.

TABLE 2

*Pattern of Response by States and Time of Response to a Type of Farming Mail Survey[a]*

| Aspect of response | Vic. | N.S.W. | S. Aust | Tas. | Q'ld | Total |
|---|---|---|---|---|---|---|
| Sample size (no.) | 1670 | 555 | 370 | 259 | 223 | 3077 |
| Response to: | | | | | | |
| Original mailing (%)[b] | 34 | 22 | 36 | 36 | 18 | 31 |
| First reminder (%) | 23 | 23 | 27 | 23 | 23 | 24 |
| Second reminder (%) | 11 | 10 | 12 | 14 | 14 | 11 |
| Total response (%)[b] | 68 | 55 | 75 | 73 | 55 | 66 |
| Response within 7 weeks (%)[b] | 62 | 50 | 71 | 69 | 50 | 61 |
| Response beyond 7 weeks (%) | 6 | 5 | 4 | 4 | 5 | 5 |
| Dead letter office returns (%) | 1·3 | 0·5 | 0·5 | 0·4 | 0·4 | 0·9 |

[a] Based on the coding of the questionnaires actually returned by respondents.
[b] Including dead letter office returns.

## Response Pattern by Type of Farming

Again for the Jarrett-Dillon survey, the percentages of respondents coming from various types of farming are shown in Table 3 for four stages of response.These stages are labelled A, B, C and D. Stages A and B refer to respondents replying to the initial and first reminder questionnaires, respectively. Stages C and D both relate to the second reminder returns, stage C being those received within seven weeks of the initial contact and stage D being those received beyond seven weeks. Perusal of the response pattern by sources of income indicates a trend towards dairying and away from wheat as the response lag increased. Probably the trend against wheat is explained by the coincidence of the later survey period with harvest time. For wool, fat lamb, and beef producers, there was no clear trend. Statistically, Chi-square analysis of the raw data on income sources indicates the response stages are significantly different.

In terms of Table 3's data on average acreage, sheep run per sheep owner, and butterfat production per dairy producer, a general pattern is evident. This is for stages A, B, and C to show a decline in size of farm operation, with a subsequent pick up in stage D to larger sized

farms. This is particularly evident for the sheep and dairy production figures. Maybe the stage D returns reflect a somewhat standard but unavoidable delay suffered by larger-scale farmers in obtaining the appropriate production records from their accountants. At any rate, $t$ tests indicate differences between many of the response-stage averages to be highly significant.

TABLE 3

*Time Pattern of Response by Farm Types in a Type of Farming Mail Survey*

| Characteristic | Response stage | | | |
|---|---|---|---|---|
|  | A | B | C | D |
| No. of respondents | 954 | 733 | 184 | 160 |
| Classification by major income source: |  |  |  |  |
| 'Deadwood'[a] | 7·6% | 12·0% | 13·0% | 10·6% |
| Wool | 33·0% | 28·6% | 20·1% | 32·3% |
| Dairy | 26·8% | 28·6% | 29·3% | 32·3% |
| Wheat | 10·3% | 11·3% | 7·1% | 3·7% |
| Other enterprises | 22·3% | 19·5% | 30·5% | 21·1% |
|  | 100·0% | 100·0% | 100·0% | 100·0% |
| Enterprises yielding at least 20% of gross income[b]: |  |  |  |  |
| Wool | 51·1% | 44·7% | 31·5% | 45·3% |
| Fat lambs | 13·6% | 11·0% | 6·5% | 11·2% |
| Beef | 21·5% | 21·2% | 15·2% | 22·3% |
| Dairy | 31·0% | 32·9% | 33·1% | 35·4% |
| Wheat | 22·5% | 20·1% | 14·7% | 14·3% |
| Average total acreage[c,d] | 865 | 638 | 553 | 766 |
|  | (103) | (42) | (68) | (139) |
| No. of sheep per sheep owner[d] | 1,602 | 1,473 | 1,298 | 2,114 |
|  | (109) | (122) | (173) | (300) |
| Lb. butterfat per dairy producer[d] | 12,976 | 10,303 | 9,693 | 17,234 |
|  | (749) | (574) | (947) | (2,587) |

[a] Returns from sample members who were deceased, retired or otherwise inactive or ineligible.
[b] Percentage of respondents who received more than 28% of their gross income from the listed enterprise.
[c] 'Deadwood' respondents excluded.
[d] The averages are simple averages of the relevant respondents' returns. Standard errors are shown in parentheses.

Overall, the data of Table 3 exhibits a rather unexpected, if not peculiar, pattern. Although it is not addressed specifically to the question of non-response bias (which could be best assessed by personal interview of a sample of non-respondents), the data of Table 3 does not follow a trend such as to suggest unambiguously that small scale producers tend to be the slowest to respond to mail questionnaires and to be in a preponderance among non-respondents.