**Wheat and Barley Scab Sampling Methodology**

There are 17 states that will be targeted for this survey. They include AR, IL, IN, KS, KY, MD, MI, MN, NO, NE, NY, NC, ND, OH, PA, SD and VA. The target population includes any active farming operation in the 17 states listed above who has harvested either wheat or barley. The goal of this survey is to make conclusions at the state level, so each state will be sampled independently depending upon their respective population counts. A systematic random sample will be utilized to create the sample. Refer to the table below to view the population counts by state, and the required number of completed reports to attain the specified level of precision, while assuming a 95% confidence level.

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| --- | --- | --- | --- |
|  | **Wheat and Barley Head Scab Project** |  |  |
|  | **95% confidence level** |  |  |  |
|   |   | Within | Within | Within | Within |
|   |   | 3% precision | 5% precision | 7% precision | 10% precision |
| State | Population | Sample | Sample | Sample | Sample |
|  05-AR | 2,495 | 811 | 353 | 191 | 97 |
|  17-IL | 11,247 | 1,034 | 390 | 201 | 99 |
|  18-IN | 7,307 | 976 | 381 | 199 | 99 |
|  20-KS | 21,370 | 1,064 | 394 | 204 | 100 |
|  21-KY | 9,080 | 989 | 383 | 200 | 99 |
|  24-MD | 2,251 | 811 | 353 | 191 | 97 |
|  26-MI | 8,435 | 989 | 383 | 200 | 99 |
|  27-MN | 8,648 | 989 | 383 | 200 | 99 |
|  29-MO | 10,487 | 1,034 | 390 | 201 | 99 |
|  31-NE | 7,760 | 976 | 381 | 199 | 99 |
|  36-NY | 1,813 | 714 | 333 | 185 | 95 |
|  37-NC | 4,890 | 909 | 370 | 196 | 98 |
|  38-ND | 13,109 | 1,034 | 390 | 201 | 99 |
|  39-OH | 16,771 | 1,053 | 392 | 204 | 100 |
|  42-PA | 8,834 | 989 | 383 | 200 | 99 |
|  46-SD | 7,688 | 976 | 381 | 199 | 99 |
|  51-VA | 3,495 | 870 | 364 | 194 | 98 |
|  99-US | 145,680 | 16,218 | 6,404 | 3,365 | 1,675 |

It was discussed with the client and determined that a 5% level of precision accompanied by the 95% confidence threshold would be acceptable power levels for their results. Therefore, this study will require a total of 6,404 completed reports to meet these criteria.

Next, we must consider what our expected response rate will be for this study. Given the uncertainty of the response behavior of this target population as it relates to this topic and the modes of data collection include one mailing of the survey to be accompanied by a telephone follow-up, we cautiously anticipate a 40%-50% response. To be conservative and to help ensure a successful study, the sample design will utilize an anticipated 40% response rate. This will require a total sample size of 16,218 records.

This total sample is then dispersed across the states so that the distribution of samples matches the distribution of the target population among these 17 states. Similarly, within each state, the samples are allocated between wheat and barley producers to ensure an accurate representation of the true state-level population totals for each of these crop types.