

Supplementary Materials: The Relationship Analysis on Corn Stalk Rot and Ear Rot according to *Fusarium* Species and Fumonisin Contamination in Kernels

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Table S1. Isolation frequency of *Fusarium* species in 49 samples in 2016, 2017, 2018.

| Year | Sample Number | Maize Varieties | Geographic Location | Province | Parts of Maize | <i>F. verticillioides</i> | <i>F. oxysporum</i> | FGSC | <i>F. proliferatum</i> | <i>F. equiseti</i> | <i>F. subglutinans</i> |
|------|---------------|-----------------|---------------------|------------|----------------|---------------------------|---------------------|--------|------------------------|--------------------|------------------------|
| 2016 | 1 | Zhengdan 958 | Changzhi | Shanxi | stalks | 29.2% | 25.0% | 8.3% | 0.0% | 37.5% | 0.0% |
| | | | | | ear stems | 20.0% | 40.0% | 0.0% | 0.0% | 40% | 0.0% |
| | | | | | corn seeds | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 0.0% |
| | 2 | Luyu 1611 | Changzhi | Shanxi | stalks | 16.0% | 16.0% | 52.0% | 0.0% | 16.0% | 0.0% |
| | | | | | ear stems | 20.0% | 20.0% | 40.0% | 0.0% | 20.0% | 0.0% |
| | | | | | corn seeds | 100.0% | 100.0% | 0.0% | 0.0% | 100.0% | 0.0% |
| | 3 | Xianyu 335 | Changzhi | Shanxi | stalks | 16.7% | 20.8% | 41.7% | 0.0% | 20.8% | 0.0% |
| | | | | | ear stems | 20.0% | 20.0% | 40.0% | 0.0% | 20.0% | 0.0% |
| | 4 | Zhengdan 958 | Xinzhou | Shanxi | stalks | 40.0% | 20.0% | 16.0% | 0.0% | 24.0% | 0.0% |
| | | | | | ear stems | 60.0% | 20.0% | 0.0% | 0.0% | 20.0% | 0.0% |
| 5 | Xianyu 335 | Xinzhou | Shanxi | corn seeds | 16.7% | 16.7% | 33.3% | 0.0% | 0.0% | 16.7% | |
| | | | | stalks | 33.3% | 20.8% | 8.3% | 0.0% | 37.5% | 0.0% | |
| 6 | Longdan 9 | Pingliang | Gansu | ear stems | 20.0% | 0.0% | 0.0% | 40.0 | 40.0% | 0.0% | |
| | | | | corn seeds | 60.0% | 86.7% | 0.0% | 0.0% | 60.0% | 0.0% | |
| 7 | Longdan 10 | Pingliang | Gansu | stalks | 100.0% | 68.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | ear stems | 60.0% | 40.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 8 | Xianyu 335 | Pingliang | Gansu | corn seeds | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 32.0% | 0.0% | 48.0% | 0.0% | 20.0% | 0.0% | |
| 9 | Zhengdan 958 | Pingliang | Gansu | ear stems | 60.0% | 0.0% | 0.0% | 0.0% | 40.0% | 0.0% | |
| | | | | corn seeds | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 10 | Wuke 609 | Wuwei | Gansu | stalks | 36.0% | 16.0% | 0.0% | 0.0% | 40.0% | 4.0% | |
| | | | | ear stems | 33.3% | 33.3% | 0.0% | 0.0% | 33.3% | 0.0% | |
| 10 | Wuke 609 | Wuwei | Gansu | corn seeds | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 0.0% | 24.0% | 28.0% | 0.0% | 40.0% | 8.0% | |

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|------|--------------|--------------|---------|--------------|------------|--------|--------|-------|--------|-------|------|
| | | | | ear stems | 0.0% | 0.0% | 80.0% | 0.0% | 20.0% | 0.0% | |
| | | | | corn seeds | 46.7% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 28.0% | 20.0% | 0.0% | 0.0% | 52.0% | 0.0% | |
| 11 | Zhengdan 958 | Wuwei | Gansu | ear stems | 40.0% | 20.0% | 0.0% | 0.0% | 40.0% | 0.0% | |
| | | | | corn seeds | 56.7% | 56.7% | 0.0% | 13.3% | 0.0% | 0.0% | |
| | | | | stalks | 12.5% | 20.8% | 0.0% | 0.0% | 4.2% | 12.5% | |
| 12 | Xianyu 335 | Wuwei | Gansu | ear stems | 0.0% | 0.0% | 0.0% | 0.0% | 80.0% | 0.0% | |
| | | | | corn seeds | 0.0% | 60.0% | 0.0% | 0.0% | 60.0% | 60.0% | |
| | | | | stalks | 0.0% | 23.8% | 4.8% | 19.0% | 38.1% | 0.0% | |
| 13 | Wuke 620 | Wuwei | Gansu | ear stems | 0.0% | 0.0% | 0.0% | 40.0% | 80.0 | 0.0% | |
| | | | | corn seeds | 23.3% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 42.9% | 14.3% | 23.8% | 0.0% | 14.3% | 4.8% | |
| 14 | Wuke 617 | Wuwei | Gansu | ear stems | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | corn seeds | 40.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 15.8% | 0.0% | 63.2% | 0.0% | 21.1% | 0.0% | |
| 15 | Zhengdan 958 | Changwu | Shaanxi | ear stems | 0.0% | 0.0% | 0.0% | 50.0% | 50.0% | 0.0% | |
| | | | | corn seeds | 100.0% | 100.0% | 0.0% | 0.0% | 100.0% | 0.0% | |
| | | | | stalks | 28.6% | 23.8% | 4.8% | 4.8% | 38.1% | 0.0% | |
| 16 | Xianyu 335 | Changwu | Shaanxi | ear stems | 50.0% | 50.0% | 0.0% | 0.0% | 50.0% | 0.0% | |
| | | | | corn seeds | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 23.8% | 14.3% | 0.0% | 0.0% | 61.9% | 0.0% | |
| 17 | Shandan 609 | Changwu | Shaanxi | ear stems | 0.0% | 0.0% | 60.0% | 0.0% | 0.0% | 0.0% | |
| | | | | corn seeds | 0.0% | 0.0% | 76.7% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 20.8% | 20.8% | 37.5% | 0.0% | 25.0% | 0.0% | |
| 18 | Zhengdan 958 | Yulin | Shaanxi | ear stems | 25.0% | 25.0% | 0.0% | 0.0% | 80.0% | 0.0% | |
| | | | | corn seeds | 50.0% | 50.0% | 46.7% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 17.4% | 30.4% | 30.4% | 0.0% | 21.7% | 0.0% | |
| 19 | Longdan 9 | Yongning | Ningxia | ear stems | 20.0% | 40.0% | 0.0% | 0.0% | 40.0% | 0.0% | |
| | | | | corn seeds | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 24.0% | 28.0% | 0.0% | 0.0% | 48.0% | 0.0% | |
| 20 | Xianyu 335 | Tongxin | Ningxia | ear stems | 20.0% | 40.0% | 0.0% | 0.0% | 40.0% | 0.0% | |
| | | | | corn seeds | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 96.0% | 96.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 2017 | 21 | Zhengdan 958 | Harbin | Heilongjiang | ear stems | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | | | | | corn seeds | 36.7% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | | | | | stalks | 60.0% | 60.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | 22 | Keyu 16 | Harbin | Heilongjiang | ear stems | 80.0% | 80.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | | | | | corn seeds | 46.7% | 46.7% | 0.0% | 36.7% | 0.0% | 0.0% |
| | | | | | stalks | 64.0% | 64.0% | 20.0% | 0.0% | 0.0% | 0.0% |
| 23 | Xianyu 335 | Changwu | Shaanxi | ear stems | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | |

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|------|--------------|--------------|----------------|------------|-----------|--------|--------|--------|--------|--------|------|
| | | | | corn seeds | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 16.0% | 16.0% | 8.0% | 0.0% | 24.0% | 0.0% | |
| 24 | Xianyu 696 | Changzhi | Shanxi | ear stems | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 0.0% | |
| | | | | corn seeds | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 76.0% | 76.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 25 | Zhengdan 958 | Tieling | Liaoning | ear stems | 80.0% | 80.0% | 0.0% | 0.0% | 80.0% | 0.0% | |
| | | | | corn seeds | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 100.0% | 100.0% | 0.0% | 100.0% | 0.0% | 0.0% | |
| 26 | Xianyu 335 | Tieling | Liaoning | ear stems | 80.0% | 80.0% | 0.0% | 80.0% | 0.0% | 0.0% | |
| | | | | corn seeds | 80.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 56.0 % | 56.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 27 | Xianyu 335 | Shenyang | Liaoning | ear stems | 60.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | corn seeds | 50.0% | 50.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 48.0% | 28.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 28 | Zhengdan 958 | Panjin | Liaoning | ear stems | 20.0% | 20.0% | 0.0% | 0.0% | 100.0% | 0.0% | |
| | | | | corn seeds | 53.3% | 3.3% | 43.3% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 60.0% | 60.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 29 | Zhengdan 958 | Shenyang | Liaoning | ear stems | 0.0% | 0.0% | 0.0% | 0.0% | 20.0% | 0.0% | |
| | | | | corn seeds | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 48.0% | 28.0% | 0.0% | 12.0% | 0.0% | 0.0% | |
| 30 | Xianyu 335 | Tonghua | Jilin | ear stems | 60.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | corn seeds | 100.0% | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | |
| | | | | stalks | 52.0% | 36.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 31 | Qingchu 368 | Tongliao | Inner Mongolia | ear stems | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | corn seeds | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 84.0% | 84.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 32 | Zhengdan 958 | Tongxin | Ningxia | ear stems | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | corn seeds | 100.0% | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 60.0% | 60.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 33 | Xianyu 335 | Tongxin | Ningxia | ear stems | 100.0% | 40.0% | 40.0% | 0.0% | 0.0% | 0.0% | |
| | | | | corn seeds | 90.0% | 90.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 36.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 34 | Shandan 609 | Yulin | Shaanxi | ear stems | 60.0% | 0.0% | 20.0% | 0.0% | 40.0% | 0.0% | |
| | | | | corn seeds | 0.0% | 6.7% | 0.0% | 0.0% | 6.7% | 0.0% | |
| | | | | stalks | 32.0% | 0.0% | 0.0% | 0.0% | 20.0% | 0.0% | |
| 2018 | 35 | Zhengdan 958 | Yulin | Shaanxi | ear stems | 0.0% | 0.0% | 20.0% | 0.0% | 100.0% | 0.0% |
| | | | | corn seeds | 100.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| | | | | stalks | 48.0% | 40.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| 36 | Xianyu 335 | Changwu | Shaanxi | ear stems | 0.0% | 40.0% | 100.0% | 0.0% | 0.0% | 0.0% | |
| | | | | corn seeds | 43.3% | 6.7% | 0.0% | 0.0% | 0.0% | 0.0% | |

| | | | | | | | | | | |
|----|--------------|----------|---------|------------|--------|-------|--------|-------|-------|-------|
| | | | | stalks | 4.0% | 0.0% | 48.0% | 0.0% | 0.0% | 0.0% |
| 37 | Xianyu 335 | Changzhi | Shanxi | ear stems | 0.0% | 0.0% | 100.0% | 40.0% | 0.0% | 0.0% |
| | | | | corn seeds | 16.7% | 0.0% | 0.0% | 6.7% | 0.0% | 0.0% |
| 38 | Zhengdan 958 | Changzhi | Shanxi | stalks | 4.0% | 0.0% | 92.0% | 0.0% | 0.0% | 0.0% |
| | | | | ear stems | 0.0% | 0.0% | 80.0% | 0.0% | 0.0% | 0.0% |
| | | | | corn seeds | 23.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 39 | Dika 517 | Changzhi | Shanxi | stalks | 0.0% | 0.0% | 100.0% | 0.0% | 0.0% | 0.0% |
| | | | | ear stems | 0.0% | 40.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | | | | corn seeds | 10.0% | 6.7% | 0.0% | 0.0% | 16.7% | 0.0% |
| 40 | Xianyu 335 | Xinzhou | Shanxi | stalks | 4.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | | | | ear stems | 60.0% | 0.0% | 0.0% | 0.0% | 0.0% | 40.0% |
| | | | | corn seeds | 43.3% | 0.0% | 0.0% | 0.0% | 0.0% | 6.7% |
| 41 | Zhengdan 958 | Xinzhou | Shanxi | stalks | 20.0% | 0.0% | 48.0% | 0.0% | 0.0% | 0.0% |
| | | | | ear stems | 80.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | | | | corn seeds | 10.0% | 0.0% | 56.7% | 0.0% | 0.0% | 0.0% |
| 42 | M753 | Xinzhou | Shanxi | stalks | 16.0% | 0.0% | 52.0% | 0.0% | 4.0% | 0.0% |
| | | | | ear stems | 60.0% | 0.0% | 40.0% | 0.0% | 0.0% | 0.0% |
| | | | | corn seeds | 90.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 43 | Dafeng 30 | Xinzhou | Shanxi | stalks | 40.0% | 0.0% | 88.0% | 0.0% | 0.0% | 0.0% |
| | | | | ear stems | 100.0% | 40.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | | | | corn seeds | 100.0% | 6.7% | 0.0% | 0.0% | 0.0% | 0.0% |
| 44 | Yufeng 303 | Xinzhou | Shanxi | stalks | 4.0% | 0.0% | 68.0% | 0.0% | 0.0% | 0.0% |
| | | | | ear stems | 100.0% | 0.0% | 20.0% | 0.0% | 0.0% | 0.0% |
| | | | | corn seeds | 76.7% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 45 | Zhengdan 958 | Tongxin | Ningxia | stalks | 20.0% | 0.0% | 88.0% | 0.0% | 0.0% | 0.0% |
| | | | | ear stems | 0.0% | 0.0% | 60.0% | 40.0% | 0.0% | 0.0% |
| | | | | corn seeds | 40.0% | 0.0% | 73.3% | 6.7% | 0.0% | 0.0% |
| 46 | Xianyu 335 | Tongxin | Ningxia | stalks | 52.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | | | | ear stems | 100.0% | 0.0% | 20.0% | 0.0% | 0.0% | 40.0% |
| | | | | corn seeds | 0.0% | 0.0% | 46.7% | 0.0% | 0.0% | 6.7% |
| 47 | Zhengdan 958 | Zhenyuan | Gansu | stalks | 56.0% | 0.0% | 72.0% | 0.0% | 0.0% | 0.0% |
| | | | | ear stems | 0.0% | 0.0% | 60.0% | 0.0% | 0.0% | 0.0% |
| | | | | corn seeds | 33.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 48 | Xianyu 335 | Zhenyuan | Gansu | stalks | 20.0% | 0.0% | 80.0% | 0.0% | 12.0% | 0.0% |
| | | | | ear stems | 60.0% | 0.0% | 20.0% | 0.0% | 0.0% | 0.0% |
| | | | | corn seeds | 6.7% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| 49 | Yuyu 22 | Zhenyuan | Gansu | stalks | 60.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% |
| | | | | ear stems | 0.0% | 40.0% | 100.0% | 0.0% | 0.0% | 0.0% |
| | | | | corn seeds | 16.7% | 6.7% | 23.3% | 0.0% | 0.0% | 0.0% |

Table S2. Sampling information.

| Region | No. of Total Samples | Average Temperature (°C) | Mean Relative Humidity (%) | Sample Year |
|-----------|----------------------|--------------------------|----------------------------|-------------|
| Wuwei | 5 | 25 | 38 | 2016 |
| Pingliang | 4 | 23 | 60 | 2016 |
| Changzhi | 3 | 25 | 58 | 2016 |
| Changwu | 3 | 22 | 47 | 2016 |
| Xinzhou | 2 | 25 | 55 | 2016 |
| Yulin | 1 | 23 | 44 | 2016 |
| Yongning | 1 | 27 | 39 | 2016 |
| Tongxin | 1 | 26 | 40 | 2016 |
| Harbin | 2 | 21 | 63 | 2017 |
| Tieling | 2 | 24 | 67 | 2017 |
| Shenyang | 2 | 24 | 60 | 2017 |
| Tongxin | 2 | 24 | 38 | 2017 |
| Changwu | 1 | 20 | 55 | 2017 |
| Changzhi | 1 | 24 | 55 | 2017 |
| Panjin | 1 | 25 | 66 | 2017 |
| Tonghua | 1 | 23 | 72 | 2017 |
| Tongliao | 1 | 24 | 51 | 2017 |
| Xinzhou | 5 | 22 | 54 | 2018 |
| Zhenyuan | 3 | 21 | 57 | 2018 |
| Changzhi | 3 | 21 | 57 | 2018 |
| Yulin | 2 | 19 | 45 | 2018 |
| Tongxin | 2 | 21 | 42 | 2018 |
| Changwu | 1 | 20 | 45 | 2018 |

Table S3. Sample collection of corn stalk rot.

| Province | Geographic Location | Year | Zhengdan 958 | Xianyu 335 | Local Main Varieties |
|----------|---------------------|------|--------------|------------|-------------------------------|
| Shanxi | Changzhi | 2016 | √ | √ | Luyu 1611 |
| | | 2017 | | | Xianyu 696 |
| | | 2018 | √ | √ | Dika 517 |
| | Xinzhou | 2016 | √ | √ | |
| | | 2018 | √ | √ | M753 Dafeng30 Yufeng303 |
| Shaanxi | Changwu | 2016 | √ | √ | Shandan 609 |
| | | 2017 | | √ | |
| | | 2018 | | √ | |
| | Yulin | 2016 | √ | | |
| | | 2018 | √ | | Shandan 609 |
| Ningxia | Tongxin | 2016 | | √ | |
| | | 2017 | √ | √ | |
| | | 2018 | √ | √ | |

Table S4. Supplementary samples of corn stalk rot.

| Province | Geographic Location | Year | Zhengdan 958 | Xianyu 335 | Local Main Varieties |
|----------------|---------------------|------|--------------|------------|----------------------------------|
| Gansu | Pingliang | 2016 | √ | √ | Longdan 9 Longdan 10 |
| | Wuwei | 2016 | √ | √ | Wuke 609 Wuke 620 Wuke 617 |
| | Zhenyuan | 2018 | √ | √ | Yuyu 22 |
| Ningxia | Yongning | 2016 | | | Longdan 9 |
| Heilongjiang | Harbin | 2017 | √ | | Keyu 16 |
| Liaoning | Tieling | 2017 | √ | √ | |
| | Shenyang | 2017 | √ | √ | |
| | Panjin | 2017 | √ | | |
| Jilin | Tonghua | 2017 | | √ | |
| Inner Mongolia | Tongliao | 2017 | | | Qingchu 368 |