Problem 2(50% spray) Chris Stewart

```java
/**
 * This program runs a simulation for 100 years. This simulation predicts the affect of beetles, drought, and fires on
 * trees of different ages.The program is also capable of determining the effects of seeding clouds and spraying
 * pesticides of the crops.
 */

import java.util.concurrent.ThreadLocalRandom;
public class NorthwestLumber {
    public static void main(String args []){
        Trees start = new Trees(400000, 300000,200000, 100000);//Starting crop

        for(int i = 0; i<=100; i++){//For 100 years
            start.rainFall();//calculate rainfall
            start.surviveWeather();//See which tress survive rainfall
            start.Plant();//replace dead
            start.surviveBeetles();//Survive beetles
            start.Plant();//replace dead
            start.surviveFire();//Survive fire
            start.Harvest();//harvest five year old plants
            start.Age();//age up plants
            start.Plant();//replace dead and harvested
            if(90<=i){//Print last ten years
                System.out.println("After "+ i+" years we will have "+ start.one +" one year old trees, "+start.two+" two year old trees, "+start.three+" three year old trees, and "+start.four+" year old trees.");
            }
        }//end of 100 year loop
    }//End of main
}//End of NorthwestLumber
class Trees {//Start of tree class
    private Boolean spray= Boolean.TRUE;//If trees are sprayed
    double one;//one year old trees
    double two;//two year old trees
    double three;//three year old trees
    double four;//four year old trees
    double five = 0;//Trees ready to harvest

    private int rain;//1 = Drought 2=Moderate 3=Heavy
    public Trees(int a, int b, int c, int d){//Tree constructor
        one = a;
        two = b;
        three = c;
        four = d;

    }//end of constructor
    public void rainFall()throws NullPointerException{//Method calculates Rainfall
        int randomNum = ThreadLocalRandom.current().nextInt(1, 11 + 1);//Random value from 1-11
        if(randomNum <= 3){//If less than 3 inch it is a drought
            rain= 1;
        }
        else if(randomNum <= 10){//more than three less than 11 is moderate rainfall
            rain = 2;
        }
        else{//Any rainfall over 10 is heavy rainfall
            rain = 3;
        }
    }//End of Rainfall
    public void seedingClouds(){//Cloud seeding
        int randomNum = ThreadLocalRandom.current().nextInt(1, 100 + 1);
        if(rain == 1){//Seeding for drought
            if(randomNum<= 89){//89% chance of seeding
                rain = 2;
                return;
            }
        }
        else if(rain == 2){//Seeding for moderate
            if(randomNum<=18){//18% chance
                rain = 3;
            }
        }
    }//end of seeding
    public void surviveWeather(){//Start of survive weather
        if(rain == 1){//Survive Drought
           one = (one - (one*0.1));
           two = (two - (two*0.1));
           three = (three- (three*0.3));
           four = (four - (four*0.35));
        }
        else if(rain == 2){//Survive Moderate rainfall
            one = (one - (one*0.05));
            two = (two - (two*0.05));
            three = (three- (three*0.05));
            four = (four - (four*0.05));
        }
        else{//survive Heavy rainfall
            one = (one - (one*0.02));
            two = (two - (two*0.03));
            three = (three- (three*0.03));
            four = (four - (four*0.04));
        }
    }//end of surviveWeather
    public void surviveBeetles() {//start of survive beetles
        if (spray == Boolean.TRUE) {//Check if plants are sprayed
            if (rain == 1) {//Drought sprayed plant survival
                one = (one - (one * 0.1));
                two = (two - (two * 0.15));
                three = (three - ((three/2) * 0.3));
                four = (four - ((four/2) * 0.3));
            } else if (rain == 2) {//Moderate sprayed plant survival
                one = (one - (one * 0.05));
                two = (two - (two * 0.05));
                three = (three - ((three/2) * 0.1));
                four = (four - ((four/2) * 0.1));
            } else {//Heavy sprayed plant survival
                three = (three - ((three/2) * 0.02));
                four = (four - ((four/2) * 0.02));
            }

        }//end of sprayed trees
        else {//Survival of non-sprayed trees
            if (rain == 1) {//Drought beetle survival
                one = (one - (one * 0.1));
                two = (two - (two * 0.15));
                three = (three - (three * 0.3));
                four = (four - (four * 0.3));
            } else if (rain == 2) {//Moderate beetle survival
        one = (one - (one * 0.05));
        two = (two - (two * 0.05));
        three = (three - (three * 0.1));
        four = (four - (four * 0.1));
      } else {//Heavy beetle survival
        three = (three - (three * 0.02));
        four = (four - (four * 0.02));
      }
    }//end of non-sprayed trees
  }//end of survive beetles
  public void surviveFire(){//Start of survive fire
    if(rain == 1){//Fire survival Drought
      one = (one - (one*0.15));
      two = (two - (two*0.18));
      three = (three- (three*0.22));
      four = (four - (four*0.3));
    }
    else if(rain == 2){//Fire survival Moderate
      one = (one - (one*0.1));
      two = (two - (two*0.12));
      three = (three- (three*0.15));
      four = (four - (four*0.2));
    }
    else{//Fire survival Heavy
      one = (one - (one*0.02));
      two = (two - (two*0.07));
      three = (three- (three*0.1));
      four = (four - (four*0.15));
    }

  }//End of surviveFire
  public double getTotal(){//Start of get total
    double total = one + two + three + four;//add total number of trees
    return total;
  }//end of getTotal
  public void Harvest(){//Start of harvest
    one = one + five;
    five = 0;
  }//End of Harvest
  public void Age(){//Start of Age
    if(rain == 1){//growing in a drought
      five=(four*0.65);
      four = (four * 0.35)+(three*0.4);
      three = (three * 0.6)+(two*0.9);
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            two = (two*0.1)+(one*0.9);
            one = (one * 0.1);

        }
        else if (rain == 2){//growing in moderate rainfall
            five=(four*0.99);
            four = (four * 0.01)+(three*0.98);
            three = (three * 0.01)+(two*0.98);
            two = (two*0.01)+(one*0.99);
            one = (one * 0.01);

        }
        else {//growing in heavy rainfall
            five=(four*0.96);
            four = (four * 0.04)+(three*0.97);
            three = (three * 0.03)+(two*0.97);
            two = (two*0.03)+(one*0.98);
            one = (one * 0.02);

        }
    }//end of age
    public void Plant(){//Start of plant
        double total = getTotal();//total plants on lot
        if(total < 1000000){//if total is less than a million
            one = one + (1000000-total);//plant free space
        }
    }//end of plant
}//End of tree class

```